

111TH CONGRESS }
2d Session }

HOUSE OF REPRESENTATIVES

{ REPORT
{ 111-478

**AMERICA COMPETES REAUTHORIZATION
ACT OF 2010**

R E P O R T

OF THE

COMMITTEE ON SCIENCE
AND TECHNOLOGY

HOUSE OF REPRESENTATIVES

ON

H.R. 5116

together with

ADDITIONAL AND DISSENTING VIEWS

[Including cost estimate of the Congressional Budget Office]



MAY 7, 2010.—Ordered to be printed

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AMERICA COMPETES REAUTHORIZATION ACT OF 2010

MAY 7, 2010.—Ordered to be printed

Mr. GORDON of Tennessee, from the Committee on Science and
Technology, submitted the following

R E P O R T

together with

ADDITIONAL AND DISSENTING VIEWS

[To accompany H.R. 5116]

[Including cost estimate of the Congressional Budget Office]

The Committee on Science and Technology, to whom was referred the bill (H.R. 5116) to invest in innovation through research and development, to improve the competitiveness of the United States, and for other purposes, having considered the same, reports favorably thereon with an amendment and recommends that the bill as amended do pass.

The amendment is as follows:

Strike all after the enacting clause and insert the following:

SECTION 1. SHORT TITLE; TABLE OF CONTENTS.

(a) **SHORT TITLE.**—This Act may be cited as the “America COMPETES Reauthorization Act of 2010”.

(b) **TABLE OF CONTENTS.**—The table of contents for this Act is as follows:

Sec. 1. Short title; table of contents.

TITLE I—SCIENCE AND TECHNOLOGY POLICY

Subtitle A—National Nanotechnology Initiative Amendments

- Sec. 101. Short title.
- Sec. 102. National nanotechnology program amendments.
- Sec. 103. Societal dimensions of nanotechnology.
- Sec. 104. Technology transfer.
- Sec. 105. Research in areas of national importance.
- Sec. 106. Nanomanufacturing research.
- Sec. 107. Definitions.

Subtitle B—Networking and Information Technology Research and Development

- Sec. 111. Short title.
- Sec. 112. Program planning and coordination.

- Sec. 113. Large-scale research in areas of national importance.
- Sec. 114. Cyber-physical systems and information management.
- Sec. 115. National Coordination Office.
- Sec. 116. Improving networking and information technology education.
- Sec. 117. Conforming and technical amendments.

Subtitle C—Other OSTP Provisions

- Sec. 121. Federal scientific collections.
- Sec. 122. Coordination of manufacturing research and development.
- Sec. 123. Interagency public access committee.
- Sec. 124. Fulfilling the potential of women in academic science and engineering.

TITLE II—NATIONAL SCIENCE FOUNDATION

- Sec. 201. Short title.

Subtitle A—General Provisions

- Sec. 211. Definitions.
- Sec. 212. Authorization of appropriations.
- Sec. 213. National Science Board administrative amendments.
- Sec. 214. Broader impacts review criterion.
- Sec. 215. National Center for Science and Engineering Statistics.
- Sec. 216. Collection of data on demographics of faculty.

Subtitle B—Research and Innovation

- Sec. 221. Support for potentially transformative research.
- Sec. 222. Facilitating interdisciplinary collaborations for national needs.
- Sec. 223. National Science Foundation manufacturing research and education.
- Sec. 224. Strengthening institutional research partnerships.
- Sec. 225. National Science Board report on mid-scale instrumentation.
- Sec. 226. Sense of Congress on overall support for research infrastructure at the Foundation.
- Sec. 227. Partnerships for innovation.
- Sec. 228. Prize awards.

Subtitle C—STEM Education and Workforce Training

- Sec. 241. Graduate student support.
- Sec. 242. Postdoctoral fellowship in STEM education research.
- Sec. 243. Robert Noyce teacher scholarship program.
- Sec. 244. Institutions serving persons with disabilities.
- Sec. 245. Institutional integration.
- Sec. 246. Postdoctoral research fellowships.
- Sec. 247. Broadening participation training and outreach.
- Sec. 248. Transforming undergraduate education in STEM.
- Sec. 249. 21st century graduate education.
- Sec. 250. Undergraduate broadening participation program.
- Sec. 251. Grand challenges in education research.
- Sec. 252. Research experiences for undergraduates.
- Sec. 253. Laboratory science pilot program.
- Sec. 254. STEM industry internship programs.
- Sec. 255. Tribal colleges and universities program.

TITLE III—STEM EDUCATION

- Sec. 301. Coordination of Federal STEM education.
- Sec. 302. Advisory committee on STEM education.
- Sec. 303. STEM education at the Department of Energy.
- Sec. 304. Green energy education.

TITLE IV—NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY

- Sec. 401. Short title.
- Sec. 402. Authorization of appropriations.
- Sec. 403. Under Secretary of Commerce for Standards and Technology.
- Sec. 404. Reorganization of NIST laboratories.
- Sec. 405. Federal Government standards and conformity assessment coordination.
- Sec. 406. Manufacturing extension partnership.
- Sec. 407. Bioscience research program.
- Sec. 408. Emergency communication and tracking technologies research initiative.
- Sec. 409. TIP Advisory Board.
- Sec. 410. Underrepresented minorities.
- Sec. 411. Cyber security standards and guidelines.
- Sec. 412. Definitions.

TITLE V—INNOVATION

- Sec. 501. Office of Innovation and Entrepreneurship.
- Sec. 502. Federal loan guarantees for innovative technologies in manufacturing.
- Sec. 503. Regional innovation program.

TITLE VI—DEPARTMENT OF ENERGY

Subtitle A—Office of Science

- Sec. 601. Short title.
- Sec. 602. Definitions.
- Sec. 603. Mission of the Office of Science.
- Sec. 604. Basic Energy Sciences Program.
- Sec. 605. Biological and Environmental Research Program.
- Sec. 606. Advanced Scientific Computing Research Program.
- Sec. 607. Fusion energy research program.
- Sec. 608. High Energy Physics Program.

Sec. 609. Nuclear Physics Program.
 Sec. 610. Science Laboratories Infrastructure Program.
 Sec. 611. Authorization of appropriations.

Subtitle B—Advanced Research Projects Agency-Energy

Sec. 621. Short title.
 Sec. 622. ARPA-E amendments.

Subtitle C—Energy Innovation Hubs

Sec. 631. Short title.
 Sec. 632. Energy Innovation Hubs.

Subtitle D—Cooperative Research and Development Fund

Sec. 641. Short title.
 Sec. 642. Cooperative research and development fund.

TITLE VII—MISCELLANEOUS

Sec. 701. Sense of Congress.
 Sec. 702. Persons with disabilities.
 Sec. 703. Veterans and service members.

TITLE I—SCIENCE AND TECHNOLOGY POLICY

Subtitle A—National Nanotechnology Initiative Amendments

SEC. 101. SHORT TITLE.

This subtitle may be cited as the “National Nanotechnology Initiative Amendments Act of 2010”.

SEC. 102. NATIONAL NANOTECHNOLOGY PROGRAM AMENDMENTS.

The 21st Century Nanotechnology Research and Development Act (15 U.S.C. 7501 et seq.) is amended—

(1) by striking section 2(c)(4) and inserting the following new paragraph:

“(4) develop, within 12 months after the date of enactment of the National Nanotechnology Initiative Amendments Act of 2010, and update every 3 years thereafter, a strategic plan to guide the activities described under subsection (b) that specifies near-term and long-term objectives for the Program, the anticipated time frame for achieving the near-term objectives, and the metrics to be used for assessing progress toward the objectives, and that describes—

“(A) how the Program will move results out of the laboratory and into applications for the benefit of society, including through cooperation and collaborations with nanotechnology research, development, and technology transition initiatives supported by the States;

“(B) how the Program will encourage and support interdisciplinary research and development in nanotechnology; and

“(C) proposed research in areas of national importance in accordance with the requirements of section 105 of the National Nanotechnology Initiative Amendments Act of 2010;”;

(2) in section 2—

(A) in subsection (d)—

(i) by redesignating paragraphs (1) through (5) as paragraphs (2) through (6), respectively; and

(ii) by inserting the following new paragraph before paragraph (2), as so redesignated by clause (i) of this subparagraph:

“(1) the Program budget, for the previous fiscal year, for each agency that participates in the Program, including a breakout of spending for the development and acquisition of research facilities and instrumentation, for each program component area, and for all activities pursuant to subsection (b)(10);”;

(B) by inserting at the end the following new subsection:

“(e) STANDARDS SETTING.—The agencies participating in the Program shall support the activities of committees involved in the development of standards for nanotechnology and may reimburse the travel costs of scientists and engineers who participate in activities of such committees.”;

(3) by striking section 3(b) and inserting the following new subsection:

“(b) FUNDING.—(1) The operation of the National Nanotechnology Coordination Office shall be supported by funds from each agency participating in the Program. The portion of such Office’s total budget provided by each agency for each fiscal year shall be in the same proportion as the agency’s share of the total budget for the

Program for the previous fiscal year, as specified in the report required under section 2(d)(1).

“(2) The annual report under section 2(d) shall include—

“(A) a description of the funding required by the National Nanotechnology Coordination Office to perform the functions specified under subsection (a) for the next fiscal year by category of activity, including the funding required to carry out the requirements of section 2(b)(10)(D), subsection (d) of this section, and section 5;

“(B) a description of the funding required by such Office to perform the functions specified under subsection (a) for the current fiscal year by category of activity, including the funding required to carry out the requirements of subsection (d); and

“(C) the amount of funding provided for such Office for the current fiscal year by each agency participating in the Program.”;

(4) by inserting at the end of section 3 the following new subsection:

“(d) PUBLIC INFORMATION.—(1) The National Nanotechnology Coordination Office shall develop and maintain a database accessible by the public of projects funded under the Environmental, Health, and Safety, the Education and Societal Dimensions, and the Nanomanufacturing program component areas, or any successor program component areas, including a description of each project, its source of funding by agency, and its funding history. For the Environmental, Health, and Safety program component area, or any successor program component area, projects shall be grouped by major objective as defined by the research plan required under section 103(b) of the National Nanotechnology Initiative Amendments Act of 2010. For the Education and Societal Dimensions program component area, or any successor program component area, the projects shall be grouped in subcategories of—

“(A) education in formal settings;

“(B) education in informal settings;

“(C) public outreach; and

“(D) ethical, legal, and other societal issues.

“(2) The National Nanotechnology Coordination Office shall develop, maintain, and publicize information on nanotechnology facilities supported under the Program, and may include information on nanotechnology facilities supported by the States, that are accessible for use by individuals from academic institutions and from industry. The information shall include at a minimum the terms and conditions for the use of each facility, a description of the capabilities of the instruments and equipment available for use at the facility, and a description of the technical support available to assist users of the facility.”;

(5) in section 4(a)—

(A) by striking “or designate”;

(B) by inserting “as a distinct entity” after “Advisory Panel”; and

(C) by inserting at the end “The Advisory Panel shall form a subpanel with membership having specific qualifications tailored to enable it to carry out the requirements of subsection (c)(7).”;

(6) in section 4(b)—

(A) by striking “or designated” and “or designating”; and

(B) by adding at the end the following: “At least one member of the Advisory Panel shall be an individual employed by and representing a minority-serving institution.”;

(7) by amending section 5 to read as follows:

“SEC. 5. TRIENNIAL EXTERNAL REVIEW OF THE NATIONAL NANOTECHNOLOGY PROGRAM.

“(a) IN GENERAL.—The Director of the National Nanotechnology Coordination Office shall enter into an arrangement with the National Research Council of the National Academy of Sciences to conduct a triennial review of the Program. The Director shall ensure that the arrangement with the National Research Council is concluded in order to allow sufficient time for the reporting requirements of subsection (b) to be satisfied. Each triennial review shall include an evaluation of the—

“(1) research priorities and technical content of the Program, including whether the allocation of funding among program component areas, as designated according to section 2(c)(2), is appropriate;

“(2) effectiveness of the Program’s management and coordination across agencies and disciplines, including an assessment of the effectiveness of the National Nanotechnology Coordination Office;

“(3) Program’s scientific and technological accomplishments and its success in transferring technology to the private sector; and

“(4) adequacy of the Program’s activities addressing ethical, legal, environmental, and other appropriate societal concerns, including human health concerns.

“(b) EVALUATION TO BE TRANSMITTED TO CONGRESS.—The National Research Council shall document the results of each triennial review carried out in accordance with subsection (a) in a report that includes any recommendations for ways to improve the Program’s management and coordination processes and for changes to the Program’s objectives, funding priorities, and technical content. Each report shall be submitted to the Director of the National Nanotechnology Coordination Office, who shall transmit it to the Advisory Panel, the Committee on Commerce, Science, and Transportation of the Senate, and the Committee on Science and Technology of the House of Representatives not later than September 30 of every third year, with the first report due September 30, 2010.

“(c) FUNDING.—Of the amounts provided in accordance with section 3(b)(1), the following amounts shall be available to carry out this section:

“(1) \$500,000 for fiscal year 2010.

“(2) \$500,000 for fiscal year 2011.

“(3) \$500,000 for fiscal year 2012.”; and

(8) in section 10—

(A) by amending paragraph (2) to read as follows:

“(2) NANOTECHNOLOGY.—The term ‘nanotechnology’ means the science and technology that will enable one to understand, measure, manipulate, and manufacture at the nanoscale, aimed at creating materials, devices, and systems with fundamentally new properties or functions.”; and

(B) by adding at the end the following new paragraph:

“(7) NANOSCALE.—The term ‘nanoscale’ means one or more dimensions of between approximately 1 and 100 nanometers.”.

SEC. 103. SOCIETAL DIMENSIONS OF NANOTECHNOLOGY.

(a) COORDINATOR FOR SOCIETAL DIMENSIONS OF NANOTECHNOLOGY.—The Director of the Office of Science and Technology Policy shall designate an associate director of the Office of Science and Technology Policy as the Coordinator for Societal Dimensions of Nanotechnology. The Coordinator shall be responsible for oversight of the coordination, planning, and budget prioritization of activities required by section 2(b)(10) of the 21st Century Nanotechnology Research and Development Act (15 U.S.C. 7501(b)(10)). The Coordinator shall, with the assistance of appropriate senior officials of the agencies funding activities within the Environmental, Health, and Safety and the Education and Societal Dimensions program component areas of the Program, or any successor program component areas, ensure that the requirements of such section 2(b)(10) are satisfied. The responsibilities of the Coordinator shall include—

(1) ensuring that a research plan for the environmental, health, and safety research activities required under subsection (b) is developed, updated, and implemented and that the plan is responsive to the recommendations of the subpanel of the Advisory Panel established under section 4(a) of the 21st Century Nanotechnology Research and Development Act (15 U.S.C. 7503(a)), as amended by this subtitle;

(2) encouraging and monitoring the efforts of the agencies participating in the Program to allocate the level of resources and management attention necessary to ensure that the ethical, legal, environmental, and other appropriate societal concerns related to nanotechnology, including human health concerns, are addressed under the Program, including the implementation of the research plan described in subsection (b); and

(3) encouraging the agencies required to develop the research plan under subsection (b) to identify, assess, and implement suitable mechanisms for the establishment of public-private partnerships for support of environmental, health, and safety research.

(b) RESEARCH PLAN.—

(1) IN GENERAL.—The Coordinator for Societal Dimensions of Nanotechnology shall convene and chair a panel comprised of representatives from the agencies funding research activities under the Environmental, Health, and Safety program component area of the Program, or any successor program component area, and from such other agencies as the Coordinator considers necessary to develop, periodically update, and coordinate the implementation of a research plan for this program component area. In developing and updating the plan, the panel convened by the Coordinator shall solicit and be responsive to recommendations and advice from—

(A) the subpanel of the Advisory Panel established under section 4(a) of the 21st Century Nanotechnology Research and Development Act (15 U.S.C. 7503(a)), as amended by this subtitle; and

(B) the agencies responsible for environmental, health, and safety regulations associated with the production, use, and disposal of nanoscale materials and products.

(2) DEVELOPMENT OF STANDARDS.—The plan required under paragraph (1) shall include a description of how the Program will help to ensure the development of—

(A) standards related to nomenclature associated with engineered nanoscale materials;

(B) engineered nanoscale standard reference materials for environmental, health, and safety testing; and

(C) standards related to methods and procedures for detecting, measuring, monitoring, sampling, and testing engineered nanoscale materials for environmental, health, and safety impacts.

(3) COMPONENTS OF PLAN.—The plan required under paragraph (1) shall, with respect to activities described in paragraphs (1) and (2)—

(A) specify near-term research objectives and long-term research objectives;

(B) specify milestones associated with each near-term objective and the estimated time and resources required to reach each milestone;

(C) with respect to subparagraphs (A) and (B), describe the role of each agency carrying out or sponsoring research in order to meet the objectives specified under subparagraph (A) and to achieve the milestones specified under subparagraph (B);

(D) specify the funding allocated to each major objective of the plan and the source of funding by agency for the current fiscal year; and

(E) estimate the funding required for each major objective of the plan and the source of funding by agency for the following 3 fiscal years.

(4) TRANSMITTAL TO CONGRESS.—The plan required under paragraph (1) shall be submitted not later than 60 days after the date of enactment of this Act to the Committee on Commerce, Science, and Transportation of the Senate and the Committee on Science and Technology of the House of Representatives.

(5) UPDATING AND APPENDING TO REPORT.—The plan required under paragraph (1) shall be updated annually and appended to the report required under section 2(d) of the 21st Century Nanotechnology Research and Development Act (15 U.S.C. 7501(d)).

(c) NANOTECHNOLOGY PARTNERSHIPS.—

(1) ESTABLISHMENT.—As part of the program authorized by section 9 of the National Science Foundation Authorization Act of 2002, the Director of the National Science Foundation shall provide 1 or more grants to establish partnerships as defined by subsection (a)(2) of that section, except that each such partnership shall include 1 or more businesses engaged in the production of nanoscale materials, products, or devices. Partnerships established in accordance with this subsection shall be designated as “Nanotechnology Education Partnerships”.

(2) PURPOSE.—Nanotechnology Education Partnerships shall be designed to recruit and help prepare secondary school students to pursue postsecondary level courses of instruction in nanotechnology. At a minimum, grants shall be used to support—

(A) professional development activities to enable secondary school teachers to use curricular materials incorporating nanotechnology and to inform teachers about career possibilities for students in nanotechnology;

(B) enrichment programs for students, including access to nanotechnology facilities and equipment at partner institutions, to increase their understanding of nanoscale science and technology and to inform them about career possibilities in nanotechnology as scientists, engineers, and technicians; and

(C) identification of appropriate nanotechnology educational materials and incorporation of nanotechnology into the curriculum for secondary school students at one or more organizations participating in a Partnership.

(3) SELECTION.—Grants under this subsection shall be awarded in accordance with subsection (b) of such section 9, except that paragraph (3)(B) of that subsection shall not apply.

(d) UNDERGRADUATE EDUCATION PROGRAMS.—

(1) ACTIVITIES SUPPORTED.—As part of the activities included under the Education and Societal Dimensions program component area, or any successor program component area, the Program shall support efforts to introduce nanoscale science, engineering, and technology into undergraduate science and engineering education through a variety of interdisciplinary approaches. Activities supported may include—

- (A) development of courses of instruction or modules to existing courses;
 - (B) faculty professional development; and
 - (C) acquisition of equipment and instrumentation suitable for undergraduate education and research in nanotechnology.
- (2) COURSE, CURRICULUM, AND LABORATORY IMPROVEMENT AUTHORIZATION.—There are authorized to be appropriated to the Director of the National Science Foundation to carry out activities described in paragraph (1) through the Course, Curriculum, and Laboratory Improvement program from amounts authorized under section 7002(c)(2)(B) of the America COMPETES Act, \$5,000,000 for fiscal year 2010.
- (3) ADVANCED TECHNOLOGY EDUCATION AUTHORIZATION.—There are authorized to be appropriated to the Director of the National Science Foundation to carry out activities described in paragraph (1) through the Advanced Technology Education program from amounts authorized under section 7002(c)(2)(B) of the America COMPETES Act, \$5,000,000 for fiscal year 2010.
- (e) INTERAGENCY WORKING GROUP.—The National Science and Technology Council shall establish under the Nanoscale Science, Engineering, and Technology Subcommittee an Education Working Group to coordinate, prioritize, and plan the educational activities supported under the Program.
- (f) SOCIETAL DIMENSIONS IN NANOTECHNOLOGY EDUCATION ACTIVITIES.—Activities supported under the Education and Societal Dimensions program component area, or any successor program component area, that involve informal, precollege, or undergraduate nanotechnology education shall include education regarding the environmental, health and safety, and other societal aspects of nanotechnology.
- (g) REMOTE ACCESS TO NANOTECHNOLOGY FACILITIES.—(1) Agencies supporting nanotechnology research facilities as part of the Program shall require the entities that operate such facilities to allow access via the Internet, and support the costs associated with the provision of such access, by secondary school students and teachers, to instruments and equipment within such facilities for educational purposes. The agencies may waive this requirement for cases when particular facilities would be inappropriate for educational purposes or the costs for providing such access would be prohibitive.
- (2) The agencies identified in paragraph (1) shall require the entities that operate such nanotechnology research facilities to establish and publish procedures, guidelines, and conditions for the submission and approval of applications for the use of the facilities for the purpose identified in paragraph (1) and shall authorize personnel who operate the facilities to provide necessary technical support to students and teachers.

SEC. 104. TECHNOLOGY TRANSFER.

(a) PROTOTYPING.—

(1) ACCESS TO FACILITIES.—In accordance with section 2(b)(7) of 21st Century Nanotechnology Research and Development Act (15 U.S.C. 7501(b)(7)), the agencies supporting nanotechnology research facilities as part of the Program shall provide access to such facilities to companies for the purpose of assisting the companies in the development of prototypes of nanoscale products, devices, or processes (or products, devices, or processes enabled by nanotechnology) for determining proof of concept. The agencies shall publicize the availability of these facilities and encourage their use by companies as provided for in this section.

(2) PROCEDURES.—The agencies identified in paragraph (1)—

(A) shall establish and publish procedures, guidelines, and conditions for the submission and approval of applications for use of nanotechnology facilities;

(B) shall publish descriptions of the capabilities of facilities available for use under this subsection, including the availability of technical support; and

(C) may waive recovery, require full recovery, or require partial recovery of the costs associated with use of the facilities for projects under this subsection.

(3) SELECTION AND CRITERIA.—In cases when less than full cost recovery is required pursuant to paragraph (2)(C), projects provided access to nanotechnology facilities in accordance with this subsection shall be selected through a competitive, merit-based process, and the criteria for the selection of such projects shall include at a minimum—

(A) the readiness of the project for technology demonstration;

(B) evidence of a commitment by the applicant for further development of the project to full commercialization if the proof of concept is established by the prototype; and

(C) evidence of the potential for further funding from private sector sources following the successful demonstration of proof of concept.

The agencies may give special consideration in selecting projects to applications that are relevant to important national needs or requirements.

(b) USE OF EXISTING TECHNOLOGY TRANSFER PROGRAMS.—

(1) PARTICIPATING AGENCIES.—Each agency participating in the Program shall—

(A) encourage the submission of applications for support of nanotechnology related projects to the Small Business Innovation Research Program and the Small Business Technology Transfer Program administered by such agencies; and

(B) through the National Nanotechnology Coordination Office and within 6 months after the date of enactment of this Act, submit to the Committee on Commerce, Science, and Transportation of the Senate and the Committee on Science and Technology of the House of Representatives—

(i) the plan described in section 2(c)(7) of the 21st Century Nanotechnology Research and Development Act (15 U.S.C. 7501(c)(7)); and

(ii) a report specifying, if the agency administers a Small Business Innovation Research Program and a Small Business Technology Transfer Program—

(I) the number of proposals received for nanotechnology related projects during the current fiscal year and the previous 2 fiscal years;

(II) the number of such proposals funded in each year;

(III) the total number of nanotechnology related projects funded and the amount of funding provided for fiscal year 2004 through fiscal year 2008; and

(IV) a description of the projects identified in accordance with subclause (III) which received private sector funding beyond the period of phase II support.

(2) NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY.—The Director of the National Institute of Standards and Technology in carrying out the requirements of section 28 of the National Institute of Standards and Technology Act (15 U.S.C. 278n) shall—

(A) in regard to subsection (d) of that section, encourage the submission of proposals for support of nanotechnology related projects; and

(B) in regard to subsection (g) of that section, include a description of how the requirement of subparagraph (A) of this paragraph is being met, the number of proposals for nanotechnology related projects received, the number of such proposals funded, the total number of such projects funded since the beginning of the Technology Innovation Program, and the outcomes of such funded projects in terms of the metrics developed in accordance with such subsection (g).

(3) TIP ADVISORY BOARD.—The TIP Advisory Board established under section 28(k) of the National Institute of Standards and Technology Act (15 U.S.C. 278n(k)), in carrying out its responsibilities under subsection (k)(3), shall provide the Director of the National Institute of Standards and Technology with—

(A) advice on how to accomplish the requirement of paragraph (2)(A) of this subsection; and

(B) an assessment of the adequacy of the allocation of resources for nanotechnology related projects supported under the Technology Innovation Program.

(c) INDUSTRY LIAISON GROUPS.—An objective of the Program shall be to establish industry liaison groups for all industry sectors that would benefit from applications of nanotechnology. The Nanomanufacturing, Industry Liaison, and Innovation Working Group of the National Science and Technology Council shall actively pursue establishing such liaison groups.

(d) COORDINATION WITH STATE INITIATIVES.—Section 2(b)(5) of the 21st Century Nanotechnology Research and Development Act (15 U.S.C. 7501(b)(5)) is amended to read as follows:

“(5) ensuring United States global leadership in the development and application of nanotechnology, including through coordination and leveraging Federal investments with nanotechnology research, development, and technology transition initiatives supported by the States;”.

SEC. 105. RESEARCH IN AREAS OF NATIONAL IMPORTANCE.

(a) IN GENERAL.—The Program shall include support for nanotechnology research and development activities directed toward application areas that have the potential for significant contributions to national economic competitiveness and for other sig-

nificant societal benefits. The activities supported shall be designed to advance the development of research discoveries by demonstrating technical solutions to important problems in such areas as nano-electronics, energy efficiency, health care, and water remediation and purification. The Advisory Panel shall make recommendations to the Program for candidate research and development areas for support under this section.

(b) CHARACTERISTICS.—

(1) IN GENERAL.—Research and development activities under this section shall—

(A) include projects selected on the basis of applications for support through a competitive, merit-based process;

(B) involve collaborations among researchers in academic institutions and industry, and may involve nonprofit research institutions and Federal laboratories, as appropriate;

(C) when possible, leverage Federal investments through collaboration with related State initiatives; and

(D) include a plan for fostering the transfer of research discoveries and the results of technology demonstration activities to industry for commercial development.

(2) PROCEDURES.—Determination of the requirements for applications under this subsection, review and selection of applications for support, and subsequent funding of projects shall be carried out by a collaboration of no fewer than 2 agencies participating in the Program. In selecting applications for support, the agencies shall give special consideration to projects that include cost sharing from non-Federal sources.

(3) INTERDISCIPLINARY RESEARCH CENTERS.—Research and development activities under this section may be supported through interdisciplinary nanotechnology research centers, as authorized by section 2(b)(4) of the 21st Century Nanotechnology Research and Development Act (15 U.S.C. 7501(b)(4)), that are organized to investigate basic research questions and carry out technology demonstration activities in areas such as those identified in subsection (a).

(c) REPORT.—Reports required under section 2(d) of the 21st Century Nanotechnology Research and Development Act (15 U.S.C. 7501(d)) shall include a description of research and development areas supported in accordance with this section, including the same budget information as is required for program component areas under paragraphs (1) and (2) of such section 2(d).

SEC. 106. NANOMANUFACTURING RESEARCH.

(a) RESEARCH AREAS.—The Nanomanufacturing program component area, or any successor program component area, shall include research on—

(1) development of instrumentation and tools required for the rapid characterization of nanoscale materials and for monitoring of nanoscale manufacturing processes; and

(2) approaches and techniques for scaling the synthesis of new nanoscale materials to achieve industrial-level production rates.

(b) GREEN NANOTECHNOLOGY.—Interdisciplinary research centers supported under the Program in accordance with section 2(b)(4) of the 21st Century Nanotechnology Research and Development Act (15 U.S.C. 7501(b)(4)) that are focused on nanomanufacturing research and centers established under the authority of section 105(b)(3) of this subtitle shall include as part of the activities of such centers—

(1) research on methods and approaches to develop environmentally benign nanoscale products and nanoscale manufacturing processes, taking into consideration relevant findings and results of research supported under the Environmental, Health, and Safety program component area, or any successor program component area;

(2) fostering the transfer of the results of such research to industry; and

(3) providing for the education of scientists and engineers through interdisciplinary studies in the principles and techniques for the design and development of environmentally benign nanoscale products and processes.

(c) REVIEW OF NANOMANUFACTURING RESEARCH AND RESEARCH FACILITIES.—

(1) PUBLIC MEETING.—Not later than 12 months after the date of enactment of this Act, the National Nanotechnology Coordination Office shall sponsor a public meeting, including representation from a wide range of industries engaged in nanoscale manufacturing, to—

(A) obtain the views of participants at the meeting on—

(i) the relevance and value of the research being carried out under the Nanomanufacturing program component area of the Program, or any successor program component area; and

(ii) whether the capabilities of nanotechnology research facilities supported under the Program are adequate—

(I) to meet current and near-term requirements for the fabrication and characterization of nanoscale devices and systems; and

(II) to provide access to and use of instrumentation and equipment at the facilities, by means of networking technology, to individuals who are at locations remote from the facilities; and

(B) receive any recommendations on ways to strengthen the research portfolio supported under the Nanomanufacturing program component area, or any successor program component area, and on improving the capabilities of nanotechnology research facilities supported under the Program.

Companies participating in industry liaison groups shall be invited to participate in the meeting. The Coordination Office shall prepare a report documenting the findings and recommendations resulting from the meeting.

(2) **ADVISORY PANEL REVIEW.**—The Advisory Panel shall review the Nanomanufacturing program component area of the Program, or any successor program component area, and the capabilities of nanotechnology research facilities supported under the Program to assess—

(A) whether the funding for the Nanomanufacturing program component area, or any successor program component area, is adequate and receiving appropriate priority within the overall resources available for the Program;

(B) the relevance of the research being supported to the identified needs and requirements of industry;

(C) whether the capabilities of nanotechnology research facilities supported under the Program are adequate—

(i) to meet current and near-term requirements for the fabrication and characterization of nanoscale devices and systems; and

(ii) to provide access to and use of instrumentation and equipment at the facilities, by means of networking technology, to individuals who are at locations remote from the facilities; and

(D) the level of funding that would be needed to support—

(i) the acquisition of instrumentation, equipment, and networking technology sufficient to provide the capabilities at nanotechnology research facilities described in subparagraph (C); and

(ii) the operation and maintenance of such facilities.

In carrying out its assessment, the Advisory Panel shall take into consideration the findings and recommendations from the report required under paragraph (1).

(3) **REPORT.**—Not later than 18 months after the date of enactment of this Act, the Advisory Panel shall submit to the Committee on Commerce, Science, and Transportation of the Senate and the Committee on Science and Technology of the House of Representatives a report on its assessment required under paragraph (2), along with any recommendations and a copy of the report prepared in accordance with paragraph (1).

SEC. 107. DEFINITIONS.

In this subtitle, terms that are defined in section 10 of the 21st Century Nanotechnology Research and Development Act (15 U.S.C. 7509) have the meaning given those terms in that section.

Subtitle B—Networking and Information Technology Research and Development

SEC. 111. SHORT TITLE.

This subtitle may be cited as the “Networking and Information Technology Research and Development Act of 2010”.

SEC. 112. PROGRAM PLANNING AND COORDINATION.

(a) **PERIODIC REVIEWS.**—Section 101 of the High-Performance Computing Act of 1991 (15 U.S.C. 5511) is amended by adding at the end the following new subsection:

“(d) **PERIODIC REVIEWS.**—The agencies identified in subsection (a)(3)(B) shall—

“(1) periodically assess the contents and funding levels of the Program Component Areas and restructure the Program when warranted, taking into consideration any relevant recommendations of the advisory committee established under subsection (b); and

“(2) ensure that the Program includes large-scale, long-term, interdisciplinary research and development activities, including activities described in section 104.”

(b) DEVELOPMENT OF STRATEGIC PLAN.—Section 101 of such Act (15 U.S.C. 5511) is amended further by adding after subsection (d), as added by subsection (a) of this section, the following new subsection:

“(e) STRATEGIC PLAN.—

“(1) IN GENERAL.—The agencies identified in subsection (a)(3)(B), working through the National Science and Technology Council and with the assistance of the National Coordination Office established under section 102, shall develop, within 12 months after the date of enactment of the Networking and Information Technology Research and Development Act of 2010, and update every 3 years thereafter, a 5-year strategic plan to guide the activities described under subsection (a)(1).

“(2) CONTENTS.—The strategic plan shall specify near-term and long-term objectives for the Program, the anticipated time frame for achieving the near-term objectives, the metrics to be used for assessing progress toward the objectives, and how the Program will—

“(A) foster the transfer of research and development results into new technologies and applications for the benefit of society, including through cooperation and collaborations with networking and information technology research, development, and technology transition initiatives supported by the States;

“(B) encourage and support mechanisms for interdisciplinary research and development in networking and information technology, including through collaborations across agencies, across Program Component Areas, with industry, with Federal laboratories (as defined in section 4 of the Stevenson-Wylder Technology Innovation Act of 1980 (15 U.S.C. 3703)), and with international organizations;

“(C) address long-term challenges of national importance for which solutions require large-scale, long-term, interdisciplinary research and development;

“(D) place emphasis on innovative and high-risk projects having the potential for substantial societal returns on the research investment;

“(E) strengthen all levels of networking and information technology education and training programs to ensure an adequate, well-trained workforce; and

“(F) attract more women and underrepresented minorities to pursue post-secondary degrees in networking and information technology.

“(3) NATIONAL RESEARCH INFRASTRUCTURE.—The strategic plan developed in accordance with paragraph (1) shall be accompanied by milestones and roadmaps for establishing and maintaining the national research infrastructure required to support the Program, including the roadmap required by subsection (a)(2)(E).

“(4) RECOMMENDATIONS.—The entities involved in developing the strategic plan under paragraph (1) shall take into consideration the recommendations—

“(A) of the advisory committee established under subsection (b); and

“(B) of the stakeholders whose input was solicited by the National Coordination Office, as required under section 102(b)(3).

“(5) REPORT TO CONGRESS.—The Director of the National Coordination Office shall transmit the strategic plan required under paragraph (1) to the advisory committee, the Committee on Commerce, Science, and Transportation of the Senate, and the Committee on Science and Technology of the House of Representatives.”

(c) ADDITIONAL RESPONSIBILITIES OF DIRECTOR.—Section 101(a)(2) of such Act (15 U.S.C. 5511(a)(2)) is amended—

(1) by redesignating subparagraphs (E) and (F) as subparagraphs (F) and (G), respectively; and

(2) by inserting after subparagraph (D) the following new subparagraph:

“(E) encourage and monitor the efforts of the agencies participating in the Program to allocate the level of resources and management attention necessary to ensure that the strategic plan under subsection (e) is developed and executed effectively and that the objectives of the Program are met;”.

(d) ADVISORY COMMITTEE.—Section 101(b)(1) of such Act (15 U.S.C. 5511(b)(1)) is amended by inserting after “an advisory committee on high-performance computing,” the following: “in which the co-chairs shall be members of the President’s Council of Advisors on Science and Technology and with the remainder of the committee”.

(e) REPORT.—Section 101(a)(3) of such Act (15 U.S.C. 5511(a)(3)) is amended—

(1) in subparagraph (C)—

(A) by striking “is submitted,” and inserting “is submitted, the levels for the previous fiscal year;”; and

(B) by striking “each Program Component Area,” and inserting “each Program Component Area and research area supported in accordance with section 104;”;

(2) in subparagraph (D)—

(A) by striking “each Program Component Area,” and inserting “each Program Component Area and research area supported in accordance with section 104;”;

(B) by striking “is submitted,” and inserting “is submitted, the levels for the previous fiscal year;”; and

(C) by striking “and” after the semicolon;

(3) by redesignating subparagraph (E) as subparagraph (G); and

(4) by inserting after subparagraph (D) the following new subparagraphs:

“(E) include a description of how the objectives for each Program Component Area, and the objectives for activities that involve multiple Program Component Areas, relate to the objectives of the Program identified in the strategic plan required under subsection (e);

“(F) include—

“(i) a description of the funding required by the National Coordination Office to perform the functions specified under section 102(b) for the next fiscal year by category of activity;

“(ii) a description of the funding required by such Office to perform the functions specified under section 102(b) for the current fiscal year by category of activity; and

“(iii) the amount of funding provided for such Office for the current fiscal year by each agency participating in the Program; and”.

(f) DEFINITION.—Section 4 of such Act (15 U.S.C. 5503) is amended—

(1) by redesignating paragraphs (1) through (7) as paragraphs (2) through (8), respectively;

(2) by inserting before paragraph (2), as so redesignated, the following new paragraph:

“(1) ‘cyber-physical systems’ means physical or engineered systems whose networking and information technology functions and physical elements are deeply integrated and are actively connected to the physical world through sensors, actuators, or other means to perform monitoring and control functions;”;

(3) in paragraph (4), as so redesignated—

(A) by striking “high-performance computing” and inserting “networking and information technology”; and

(B) by striking “supercomputer” and inserting “high-end computing”;

(4) in paragraph (6), as so redesignated, by striking “network referred to as” and all that follows through the semicolon and inserting “network, including advanced computer networks of Federal agencies and departments;”; and

(5) in paragraph (7), as so redesignated, by striking “National High-Performance Computing Program” and inserting “networking and information technology research and development program”.

SEC. 113. LARGE-SCALE RESEARCH IN AREAS OF NATIONAL IMPORTANCE.

Title I of such Act (15 U.S.C. 5511) is amended by adding at the end the following new section:

“SEC. 104. LARGE-SCALE RESEARCH IN AREAS OF NATIONAL IMPORTANCE.

“(a) IN GENERAL.—The Program shall encourage agencies identified in section 101(a)(3)(B) to support large-scale, long-term, interdisciplinary research and development activities in networking and information technology directed toward application areas that have the potential for significant contributions to national economic competitiveness and for other significant societal benefits. Such activities, ranging from basic research to the demonstration of technical solutions, shall be designed to advance the development of research discoveries. The advisory committee established under section 101(b) shall make recommendations to the Program for candidate research and development areas for support under this section.

“(b) CHARACTERISTICS.—

“(1) IN GENERAL.—Research and development activities under this section shall—

“(A) include projects selected on the basis of applications for support through a competitive, merit-based process;

“(B) involve collaborations among researchers in institutions of higher education and industry, and may involve nonprofit research institutions and Federal laboratories, as appropriate;

“(C) when possible, leverage Federal investments through collaboration with related State initiatives; and

“(D) include a plan for fostering the transfer of research discoveries and the results of technology demonstration activities, including from institutions of higher education and Federal laboratories, to industry for commercial development.

“(2) COST-SHARING.—In selecting applications for support, the agencies shall give special consideration to projects that include cost sharing from non-Federal sources.

“(3) AGENCY COLLABORATION.—If 2 or more agencies identified in section 101(a)(3)(B), or other appropriate agencies, are working on large-scale research and development activities in the same area of national importance, then such agencies shall strive to collaborate through joint solicitation and selection of applications for support and subsequent funding of projects.

“(4) INTERDISCIPLINARY RESEARCH CENTERS.—Research and development activities under this section may be supported through interdisciplinary research centers that are organized to investigate basic research questions and carry out technology demonstration activities in areas described in subsection (a). Research may be carried out through existing interdisciplinary centers, including those authorized under section 7024(b)(2) of the America COMPETES Act (Public Law 110–69; 42 U.S.C. 1862o–10).”.

SEC. 114. CYBER-PHYSICAL SYSTEMS AND INFORMATION MANAGEMENT.

(a) ADDITIONAL PROGRAM CHARACTERISTICS.—Section 101(a)(1) of such Act (15 U.S.C. 5511(a)(1)) is amended—

(1) in subparagraph (H), by striking “and” after the semicolon;

(2) in subparagraph (I), by striking the period at the end and inserting a semicolon; and

(3) by adding at the end the following new subparagraphs:

“(J) provide for increased understanding of the scientific principles of cyber-physical systems and improve the methods available for the design, development, and operation of cyber-physical systems that are characterized by high reliability, safety, and security; and

“(K) provide for research and development on human-computer interactions, visualization, and information management.”.

(b) TASK FORCE.—Title I of such Act (15 U.S.C. 5511) is amended further by adding after section 104, as added by section 113 of this Act, the following new section:

“SEC. 105. UNIVERSITY/INDUSTRY TASK FORCE.

“(a) ESTABLISHMENT.—Not later than 180 days after the date of enactment of the Networking and Information Technology Research and Development Act of 2010, the Director of the National Coordination Office established under section 102 shall convene a task force to explore mechanisms for carrying out collaborative research and development activities for cyber-physical systems, including the related technologies required to enable these systems, through a consortium or other appropriate entity with participants from institutions of higher education, Federal laboratories, and industry.

“(b) FUNCTIONS.—The task force shall—

“(1) develop options for a collaborative model and an organizational structure for such entity under which the joint research and development activities could be planned, managed, and conducted effectively, including mechanisms for the allocation of resources among the participants in such entity for support of such activities;

“(2) propose a process for developing a research and development agenda for such entity, including objectives and milestones;

“(3) define the roles and responsibilities for the participants from institutions of higher education, Federal laboratories, and industry in such entity;

“(4) propose guidelines for assigning intellectual property rights and for the transfer of research results to the private sector; and

“(5) make recommendations for how such entity could be funded from Federal, State, and non-governmental sources.

“(c) COMPOSITION.—In establishing the task force under subsection (a), the Director of the National Coordination Office shall appoint an equal number of individuals from institutions of higher education and from industry with knowledge and expertise in cyber-physical systems, of which 2 may be selected from Federal laboratories.

“(d) REPORT.—Not later than 1 year after the date of enactment of the Networking and Information Technology Research and Development Act of 2010, the Director of the National Coordination Office shall transmit to the Committee on Commerce, Science, and Transportation of the Senate and the Committee on Science and Tech-

nology of the House of Representatives a report describing the findings and recommendations of the task force.”.

SEC. 115. NATIONAL COORDINATION OFFICE.

Section 102 of such Act (15 U.S.C. 5512) is amended to read as follows:

“SEC. 102. NATIONAL COORDINATION OFFICE.

“(a) **ESTABLISHMENT.**—The Director shall establish a National Coordination Office with a Director and full-time staff.

“(b) **FUNCTIONS.**—The National Coordination Office shall—

“(1) provide technical and administrative support to—

“(A) the agencies participating in planning and implementing the Program, including such support as needed in the development of the strategic plan under section 101(e); and

“(B) the advisory committee established under section 101(b);

“(2) serve as the primary point of contact on Federal networking and information technology activities for government organizations, academia, industry, professional societies, State computing and networking technology programs, interested citizen groups, and others to exchange technical and programmatic information;

“(3) solicit input and recommendations from a wide range of stakeholders during the development of each strategic plan required under section 101(e) through the convening of at least 1 workshop with invitees from academia, industry, Federal laboratories, and other relevant organizations and institutions;

“(4) conduct public outreach, including the dissemination of findings and recommendations of the advisory committee, as appropriate; and

“(5) promote access to and early application of the technologies, innovations, and expertise derived from Program activities to agency missions and systems across the Federal Government and to United States industry.

“(c) **SOURCE OF FUNDING.**—

“(1) **IN GENERAL.**—The operation of the National Coordination Office shall be supported by funds from each agency participating in the Program.

“(2) **SPECIFICATIONS.**—The portion of the total budget of such Office that is provided by each agency for each fiscal year shall be in the same proportion as each such agency’s share of the total budget for the Program for the previous fiscal year, as specified in the report required under section 101(a)(3).”.

SEC. 116. IMPROVING NETWORKING AND INFORMATION TECHNOLOGY EDUCATION.

Section 201(a) of such Act (15 U.S.C. 5521(a)) is amended—

(1) by redesignating paragraphs (2) through (4) as paragraphs (3) through (5), respectively; and

(2) by inserting after paragraph (1) the following new paragraph:

“(2) the National Science Foundation shall use its existing programs, in collaboration with other agencies, as appropriate, to improve the teaching and learning of networking and information technology at all levels of education and to increase participation in networking and information technology fields, including by women and underrepresented minorities;”.

SEC. 117. CONFORMING AND TECHNICAL AMENDMENTS.

(a) **SECTION 3.**—Section 3 of such Act (15 U.S.C. 5502) is amended—

(1) in the matter preceding paragraph (1), by striking “high-performance computing” and inserting “networking and information technology”;

(2) in paragraph (1), in the matter preceding subparagraph (A), by striking “high-performance computing” and inserting “networking and information technology”;

(3) in subparagraphs (A) and (F) of paragraph (1), by striking “high-performance computing” each place it appears and inserting “networking and information technology”; and

(4) in paragraph (2)—

(A) by striking “high-performance computing and” and inserting “networking and information technology and”; and

(B) by striking “high-performance computing network” and inserting “networking and information technology”.

(b) **TITLE I.**—The heading of title I of such Act (15 U.S.C. 5511) is amended by striking “**HIGH-PERFORMANCE COMPUTING**” and inserting “**NETWORKING AND INFORMATION TECHNOLOGY**”.

(c) **SECTION 101.**—Section 101 of such Act (15 U.S.C. 5511) is amended—

(1) in the section heading, by striking “HIGH-PERFORMANCE COMPUTING” and inserting “NETWORKING AND INFORMATION TECHNOLOGY RESEARCH AND DEVELOPMENT”;

(2) in subsection (a)—

(A) in the subsection heading, by striking “NATIONAL HIGH-PERFORMANCE COMPUTING” and inserting “NETWORKING AND INFORMATION TECHNOLOGY RESEARCH AND DEVELOPMENT”;

(B) in paragraph (1) of such subsection—

(i) in the matter preceding subparagraph (A), by striking “National High-Performance Computing Program” and inserting “networking and information technology research and development program”;

(ii) in subparagraph (A), by striking “high-performance computing, including networking” and inserting “networking and information technology”; and

(iii) in subparagraphs (B), (C), and (G), by striking “high-performance” each place it appears and inserting “high-end”; and

(C) in paragraph (2) of such subsection—

(i) in subparagraphs (A) and (C)—

(I) by striking “high-performance computing” each place it appears and inserting “networking and information technology”; and

(II) by striking “development, networking,” each place it appears and inserting “development,”; and

(ii) in subparagraphs (F) and (G), as redesignated by section 112(c)(1) of this Act, by striking “high-performance” each place it appears and inserting “high-end”;

(3) in subsection (b)(1), in the matter preceding subparagraph (A), by striking “high-performance computing” both places it appears and inserting “networking and information technology”; and

(4) in subsection (c)(1)(A), by striking “high-performance computing” and inserting “networking and information technology”.

(d) SECTION 201.—Section 201(a)(1) of such Act (15 U.S.C. 5521(a)(1)) is amended by striking “high-performance computing” and all that follows through “networking;” and inserting “networking and information research and development;”.

(e) SECTION 202.—Section 202(a) of such Act (15 U.S.C. 5522(a)) is amended by striking “high-performance computing” and inserting “networking and information technology”.

(f) SECTION 203.—Section 203(a)(1) of such Act (15 U.S.C. 5523(a)(1)) is amended by striking “high-performance computing and networking” and inserting “networking and information technology”.

(g) SECTION 204.—Section 204(a)(1) of such Act (15 U.S.C. 5524(a)(1)) is amended—

(1) in subparagraph (A), by striking “high-performance computing systems and networks” and inserting “networking and information technology systems and capabilities”; and

(2) in subparagraph (C), by striking “high-performance computing” and inserting “networking and information technology”.

(h) SECTION 205.—Section 205(a) of such Act (15 U.S.C. 5525(a)) is amended by striking “computational” and inserting “networking and information technology”.

(i) SECTION 206.—Section 206(a) of such Act (15 U.S.C. 5526(a)) is amended by striking “computational research” and inserting “networking and information technology research”.

(j) SECTION 208.—Section 208 of such Act (15 U.S.C. 5528) is amended—

(1) in the section heading, by striking “high-performance computing” and inserting “networking and information technology”; and

(2) in subsection (a)—

(A) in paragraph (1), by striking “High-performance computing and associated” and inserting “Networking and information”;

(B) in paragraph (2), by striking “high-performance computing” and inserting “networking and information technologies”;

(C) in paragraph (4), by striking “high-performance computers and associated” and inserting “networking and information”; and

(D) in paragraph (5), by striking “high-performance computing and associated” and inserting “networking and information”.

Subtitle C—Other OSTP Provisions

SEC. 121. FEDERAL SCIENTIFIC COLLECTIONS.

(a) MANAGEMENT OF SCIENTIFIC COLLECTIONS.—The Office of Science and Technology Policy, in consultation with relevant Federal agencies, shall ensure the development of formal policies for the management and use of Federal scientific collections to improve the quality, organization, access, including online access, and long-term preservation of such collections for the benefit of the scientific enterprise.

(b) **DEFINITION.**—For the purposes of this section, the term “scientific collection” means a set of physical specimens, living or inanimate, created for the purpose of supporting science and serving as a long-term research asset, rather than for their market value as collectibles or their historical, artistic, or cultural significance.

(c) **CLEARINGHOUSE.**—The Office of Science and Technology Policy, in consultation with relevant Federal agencies, shall ensure the development of an online clearinghouse for information on the contents of and access to Federal scientific collections.

(d) **DISPOSAL OF COLLECTIONS.**—The policies developed under subsection (a) shall—

(1) require that, before disposing of a scientific collection, a Federal agency shall—

- (A) conduct a review of the research value of the collection; and
- (B) consult with researchers who have used the collection, and other potentially interested parties, concerning—
 - (i) the collection’s value for research purposes; and
 - (ii) possible additional educational uses for the collection; and

(2) include procedures for Federal agencies to transfer scientific collections they no longer need to researchers at institutions or other entities qualified to manage the collections.

(e) **COST PROJECTIONS.**—The Office of Science and Technology Policy, in consultation with relevant Federal agencies, shall develop a common set of methodologies to be used by Federal agencies for the assessment and projection of costs associated with the management and preservation of their scientific collections.

SEC. 122. COORDINATION OF MANUFACTURING RESEARCH AND DEVELOPMENT.

(a) **INTERAGENCY COMMITTEE.**—The Director of the Office of Science and Technology Policy shall establish or designate an interagency committee under the National Science and Technology Council with the responsibility for planning and coordinating Federal programs and activities in manufacturing research and development.

(b) **RESPONSIBILITIES OF COMMITTEE.**—The interagency committee established or designated under subsection (a) shall—

(1) coordinate the manufacturing research and development programs and activities of the Federal agencies;

(2) establish goals and priorities for manufacturing research and development that will strengthen United States manufacturing; and

(3) develop and update every 5 years thereafter a strategic plan to guide Federal programs and activities in support of manufacturing research and development, which shall—

(A) specify and prioritize near-term and long-term research and development objectives, the anticipated time frame for achieving the objectives, and the metrics for use in assessing progress toward the objectives;

(B) specify the role of each Federal agency in carrying out or sponsoring research and development to meet the objectives of the strategic plan; and

(C) describe how the Federal agencies supporting manufacturing research and development will foster the transfer of research and development results into new manufacturing technologies, processes, and products for the benefit of society and the national interest.

(c) **RECOMMENDATIONS.**—In the development of the strategic plan required under subsection (b)(3), the Director of the Office of Science and Technology Policy, working through the interagency committee, shall take into consideration the recommendations of a wide range of stakeholders, including representatives from diverse manufacturing companies, academia, and other relevant organizations and institutions.

(d) **REPORT TO CONGRESS.**—Not later than 1 year after the date of enactment of this Act, the Director of the Office of Science and Technology Policy shall transmit the strategic plan developed under subsection (b)(3) to the Committee on Commerce, Science, and Transportation of the Senate, and the Committee on Science and Technology of the House of Representatives, and shall transmit subsequent updates to those committees when completed.

SEC. 123. INTERAGENCY PUBLIC ACCESS COMMITTEE.

(a) **ESTABLISHMENT.**—The Director of the Office of Science and Technology Policy shall establish a working group under the National Science and Technology Council with the responsibility to coordinate Federal science agency research and policies related to the dissemination and long-term stewardship of the results of unclassified research, including digital data and peer-reviewed scholarly publications, supported wholly, or in part, by funding from the Federal science agencies.

(b) **RESPONSIBILITIES.**—The working group established under subsection (a) shall—

(1) coordinate the development or designation of uniform standards for research data, the structure of full text and metadata, navigation tools, and other applications to achieve interoperability across Federal science agencies, across science and engineering disciplines, and between research data and scholarly publications, taking into account existing consensus standards, including international standards;

(2) coordinate Federal science agency programs and activities that support research and education on tools and systems required to ensure preservation and stewardship of all forms of digital research data, including scholarly publications;

(3) work with international science and technology counterparts to maximize interoperability between United States based unclassified research databases and international databases and repositories;

(4) solicit input and recommendations from, and collaborate with, non-Federal stakeholders, including universities, nonprofit and for-profit publishers, libraries, federally funded research scientists, and other organizations and institutions with a stake in long term preservation and access to the results of federally funded research; and

(5) establish priorities for coordinating the development of any Federal science agency policies related to public access to the results of federally funded research to maximize uniformity of such policies with respect to their benefit to, and potential economic or other impact on, the science and engineering enterprise and the stakeholders thereof.

(c) **PATENT OR COPYRIGHT LAW.**—Nothing in this section shall be construed to affect any right under the provisions of title 17 or 35, United States Code.

(d) **REPORT TO CONGRESS.**—Not later than 1 year after the date of enactment of this Act, the Director of the Office of Science and Technology Policy shall transmit a report to Congress describing—

(1) any priorities established under subsection (b)(5);

(2) the status of any Federal science agency policies related to public access to the results of federally funded research; and

(3) how any policies developed or being developed by Federal science agencies, as described in paragraph (2), incorporate input from the non-Federal stakeholders described in subsection (b)(4).

(e) **DEFINITION.**—For the purposes of this section, the term “Federal science agency” means any Federal agency with an annual extramural research expenditure of over \$100,000,000.

SEC. 124. FULFILLING THE POTENTIAL OF WOMEN IN ACADEMIC SCIENCE AND ENGINEERING.

(a) **DEFINITION.**—In this section, the term “Federal science agency” means any Federal agency that is responsible for at least 2 percent of total Federal research and development funding to institutions of higher education, according to the most recent data available from the National Science Foundation.

(b) **WORKSHOPS TO ENHANCE GENDER EQUITY IN ACADEMIC SCIENCE AND ENGINEERING.**—

(1) **IN GENERAL.**—Not later than 6 months after the date of enactment of this Act, the Director of the Office of Science and Technology Policy shall develop a uniform policy for all Federal science agencies to carry out a program of workshops that educate program officers, members of grant review panels, institutions of higher education STEM department chairs, and other federally funded researchers about methods that minimize the effects of gender bias in evaluation of Federal research grants and in the related academic advancement of actual and potential recipients of these grants, including hiring, tenure, promotion, and selection for any honor based in part on the recipient’s research record.

(2) **INTERAGENCY COORDINATION.**—The Director of the Office of Science and Technology Policy shall ensure that programs of workshops across the Federal science agencies are coordinated and supported jointly as appropriate. As part of this process, the Director of the Office of Science and Technology Policy shall ensure that at least 1 workshop is supported every 2 years among the Federal science agencies in each of the major science and engineering disciplines supported by those agencies.

(3) **ORGANIZATIONS ELIGIBLE TO CARRY OUT WORKSHOPS.**—Federal science agencies may carry out the program of workshops under this subsection by making grants to eligible organizations. In addition to any other organizations made eligible by the Federal science agencies, the following organizations are eligible for grants under this subsection:

(A) Nonprofit scientific and professional societies and organizations that represent one or more STEM disciplines.

(B) Nonprofit organizations that have the primary mission of advancing the participation of women in STEM.

(4) CHARACTERISTICS OF WORKSHOPS.—The workshops shall have the following characteristics:

(A) Invitees to workshops shall include at least—

(i) the chairs of departments in the relevant discipline from at least the top 50 institutions of higher education, as determined by the amount of Federal research and development funds obligated to each institution of higher education in the prior year based on data available from the National Science Foundation;

(ii) members of any standing research grant review panel appointed by the Federal science agencies in the relevant discipline;

(iii) in the case of science and engineering disciplines supported by the Department of Energy, the individuals from each of the Department of Energy National Laboratories with personnel management responsibilities comparable to those of an institution of higher education department chair; and

(iv) Federal science agency program officers in the relevant discipline, other than program officers that participate in comparable workshops organized and run specifically for that agency's program officers.

(B) Activities at the workshops shall include research presentations and interactive discussions or other activities that increase the awareness of the existence of gender bias in the grant-making process and the development of the academic record necessary to qualify as a grant recipient, including recruitment, hiring, tenure review, promotion, and other forms of formal recognition of individual achievement, and provide strategies to overcome such bias.

(C) Research presentations and other workshop programs, as appropriate, shall include a discussion of the unique challenges faced by women who are members of historically underrepresented groups.

(D) Workshop programs shall include information on best practices and the value of mentoring undergraduate and graduate women students as well as outreach to girls earlier in their STEM education.

(5) REPORT.—

(A) IN GENERAL.—Not later than 5 years after the date of enactment of this Act, the Director of the Office of Science and Technology Policy shall transmit to the Committee on Science and Technology of the House of Representatives and the Committee on Commerce, Science, and Transportation of the Senate a report evaluating the effectiveness of the program carried out under this subsection to reduce gender bias towards women engaged in research funded by the Federal Government. The Director of the Office of Science and Technology Policy shall include in this report any recommendations for improving the evaluation process described in subparagraph (B).

(B) MINIMUM CRITERIA FOR EVALUATION.—In determining the effectiveness of the program, the Director of the Office of Science and Technology Policy shall consider, at a minimum—

(i) the rates of participation by invitees in the workshops authorized under this subsection;

(ii) the results of attitudinal surveys conducted on workshop participants before and after the workshops;

(iii) any relevant institutional policy or practice changes reported by participants; and

(iv) for individuals described in paragraph (4)(A)(i) or (iii) who participated in at least 1 workshop 3 or more years prior to the due date for the report, trends in the data for the department represented by the chair or employee including faculty data related to gender as described in section 216.

(C) INSTITUTIONAL ATTENDANCE AT WORKSHOPS.—As part of the report under subparagraph (A), the Director of the Office of Science and Technology Policy shall include a list of institutions of higher education science and engineering departments whose representatives attended the workshops required under this subsection.

(6) MINIMIZING COSTS.—To the extent practicable, workshops shall be held in conjunction with national or regional disciplinary meetings to minimize costs associated with participant travel.

(c) EXTENDED RESEARCH GRANT SUPPORT AND INTERIM TECHNICAL SUPPORT FOR CAREGIVERS.—

(1) **POLICIES FOR CAREGIVERS.**—Not later than 6 months after the date of enactment of this Act, the Director of the Office of Science and Technology Policy shall develop a uniform policy to—

(A) extend the period of grant support for federally funded researchers who have caregiving responsibilities; and

(B) provide funding for interim technical staff support for federally funded researchers who take a leave of absence for caregiving responsibilities.

(2) **REPORT.**—Upon developing the policy required under paragraph (1), the Director of the Office of Science and Technology Policy shall transmit a copy of the policy to the Committee on Science and Technology of the House of Representatives and to the Committee on Commerce, Science, and Transportation of the Senate.

(d) **COLLECTION OF DATA ON FEDERAL RESEARCH GRANTS.**—

(1) **IN GENERAL.**—Each Federal science agency shall collect standardized annual composite information on demographics, field, award type and budget request, review score, and funding outcome for all applications for research and development grants to institutions of higher education supported by that agency.

(2) **REPORTING OF DATA.**—

(A) The Director of the Office of Science and Technology Policy shall establish a policy to ensure uniformity and standardization of data collection required under paragraph (1).

(B) Not later than 2 years after the date of enactment of this Act, and annually thereafter, each Federal science agency shall submit data collected under paragraph (1) to the National Science Foundation.

(C) The National Science Foundation shall be responsible for storing and publishing all of the grant data submitted under subparagraph (B) in conjunction with the biennial report required under section 37 of the Science and Engineering Equal Opportunities Act (42 U.S.C. 1885d).

TITLE II—NATIONAL SCIENCE FOUNDATION

SEC. 201. SHORT TITLE.

This title may be cited as the “National Science Foundation Authorization Act of 2010”.

Subtitle A—General Provisions

SEC. 211. DEFINITIONS.

In this title:

(1) **DIRECTOR.**—The term “Director” means the Director of the National Science Foundation established under section 2 of the National Science Foundation Act of 1950 (42 U.S.C. 1861).

(2) **FOUNDATION.**—The term “Foundation” means the National Science Foundation established under section 2 of the National Science Foundation Act of 1950 (42 U.S.C. 1861).

(3) **INSTITUTION OF HIGHER EDUCATION.**—The term “institution of higher education” has the meaning given such term in section 101(a) of the Higher Education Act of 1965 (20 U.S.C. 1001(a)).

(4) **STATE.**—The term “State” means one of the several States, the District of Columbia, the Commonwealth of Puerto Rico, the Virgin Islands, Guam, American Samoa, the Commonwealth of the Northern Mariana Islands, or any other territory or possession of the United States.

(5) **STEM.**—The term “STEM” means science, technology, engineering, and mathematics.

(6) **UNITED STATES.**—The term “United States” means the several States, the District of Columbia, the Commonwealth of Puerto Rico, the Virgin Islands, Guam, American Samoa, the Commonwealth of the Northern Mariana Islands, and any other territory or possession of the United States.

SEC. 212. AUTHORIZATION OF APPROPRIATIONS.

(a) **FISCAL YEAR 2011.**—

(1) **IN GENERAL.**—There are authorized to be appropriated to the Foundation \$7,481,000,000 for fiscal year 2011.

(2) **SPECIFIC ALLOCATIONS.**—Of the amount authorized under paragraph (1)—

- (A) \$6,020,000,000 shall be made available for research and related activities;
 - (B) \$945,000,000 shall be made available for education and human resources;
 - (C) \$166,000,000 shall be made available for major research equipment and facilities construction;
 - (D) \$330,000,000 shall be made available for agency operations and award management;
 - (E) \$4,840,000 shall be made available for the Office of the National Science Board; and
 - (F) \$14,830,000 shall be made available for the Office of Inspector General.
- (b) FISCAL YEAR 2012.—
- (1) IN GENERAL.—There are authorized to be appropriated to the Foundation \$8,127,000,000 for fiscal year 2012.
 - (2) SPECIFIC ALLOCATIONS.—Of the amount authorized under paragraph (1)—
 - (A) \$6,496,000,000 shall be made available for research and related activities;
 - (B) \$1,020,000,000 shall be made available for education and human resources;
 - (C) \$235,000,000 shall be made available for major research equipment and facilities construction;
 - (D) \$356,000,000 shall be made available for agency operations and award management;
 - (E) \$5,010,000 shall be made available for the Office of the National Science Board; and
 - (F) \$15,350,000 shall be made available for the Office of Inspector General.
- (c) FISCAL YEAR 2013.—
- (1) IN GENERAL.—There are authorized to be appropriated to the Foundation \$8,764,000,000 for fiscal year 2013.
 - (2) SPECIFIC ALLOCATIONS.—Of the amount authorized under paragraph (1)—
 - (A) \$7,009,000,000 shall be made available for research and related activities;
 - (B) \$1,100,000,000 shall be made available for education and human resources;
 - (C) \$250,000,000 shall be made available for major research equipment and facilities construction;
 - (D) \$384,000,000 shall be made available for agency operations and award management;
 - (E) \$5,180,000 shall be made available for the Office of the National Science Board; and
 - (F) \$15,890,000 shall be made available for the Office of Inspector General.
- (d) FISCAL YEAR 2014.—
- (1) IN GENERAL.—There are authorized to be appropriated to the Foundation \$9,436,000,000 for fiscal year 2014.
 - (2) SPECIFIC ALLOCATIONS.—Of the amount authorized under paragraph (1)—
 - (A) \$7,562,000,000 shall be made available for research and related activities;
 - (B) \$1,187,000,000 shall be made available for education and human resources;
 - (C) \$250,000,000 shall be made available for major research equipment and facilities construction;
 - (D) \$415,000,000 shall be made available for agency operations and award management;
 - (E) \$5,370,000 shall be made available for the Office of the National Science Board; and
 - (F) \$16,440,000 shall be made available for the Office of Inspector General.
- (e) FISCAL YEAR 2015.—
- (1) IN GENERAL.—There are authorized to be appropriated to the Foundation \$10,161,000,000 for fiscal year 2015.
 - (2) SPECIFIC ALLOCATIONS.—Of the amount authorized under paragraph (1)—
 - (A) \$8,160,000,000 shall be made available for research and related activities;
 - (B) \$1,281,000,000 shall be made available for education and human resources;

(C) \$250,000,000 shall be made available for major research equipment and facilities construction;

(D) \$447,000,000 shall be made available for agency operations and award management;

(E) \$5,550,000 shall be made available for the Office of the National Science Board; and

(F) \$17,020,000 shall be made available for the Office of Inspector General.

SEC. 213. NATIONAL SCIENCE BOARD ADMINISTRATIVE AMENDMENTS.

(a) **STAFFING AT THE NATIONAL SCIENCE BOARD.**—Section 4(g) of the National Science Foundation Act of 1950 (42 U.S.C. 1863(g)) is amended by striking “not more than 5”.

(b) **SCIENCE AND ENGINEERING INDICATORS DUE DATE.**—Section 4(j)(1) of the National Science Foundation Act of 1950 (42 U.S.C. 1863(j)(1)) is amended by striking “January 15” and inserting “May 31”.

(c) **NATIONAL SCIENCE BOARD REPORTS.**—Section 4(j)(2) of the National Science Foundation Act of 1950 (42 U.S.C. 1863(j)(2)) is amended by inserting “within the authority of the Foundation (or otherwise as requested by the appropriate Congressional committees of jurisdiction or the President)” after “individual policy matters”.

(d) **BOARD ADHERENCE TO SUNSHINE ACT.**—Section 15(a) of the National Science Foundation Authorization Act of 2002 (42 U.S.C. 1862n–5(a)) is amended—

(1) by striking paragraph (3) and redesignating paragraphs (4) and (5) as paragraphs (3) and (4), respectively;

(2) in paragraph (3), as so redesignated by paragraph (1) of this subsection—
(A) by striking “February 15” and inserting “April 15”; and

(B) by striking “the audit required under paragraph (3) along with” and inserting “any”; and

(3) in paragraph (4), as so redesignated by paragraph (1) of this subsection, by striking “To facilitate the audit required under paragraph (3) of this subsection, the” and inserting “The”.

SEC. 214. BROADER IMPACTS REVIEW CRITERION.

(a) **GOALS.**—The Foundation shall apply a Broader Impacts Review Criterion to achieve the following goals:

(1) Increased economic competitiveness of the United States.

(2) Development of a globally competitive STEM workforce.

(3) Increased participation of women and underrepresented minorities in STEM.

(4) Increased partnerships between academia and industry.

(5) Improved pre-K-12 STEM education and teacher development.

(6) Improved undergraduate STEM education.

(7) Increased public scientific literacy.

(8) Increased national security.

(b) **POLICY.**—Not later than 6 months after the date of enactment of this Act, the Director shall develop and implement a policy for the Broader Impacts Review Criterion that—

(1) provides for educating professional staff at the Foundation, merit review panels, and applicants for Foundation research grants on the policy developed under this subsection;

(2) clarifies that the activities of grant recipients undertaken to satisfy the Broader Impacts Review Criterion shall—

(A) to the extent practicable employ proven strategies and models and draw on existing programs and activities; and

(B) when novel approaches are justified, build on the most current research results;

(3) allows for some portion of funds allocated to broader impacts under a research grant to be used for assessment and evaluation of the broader impacts activity;

(4) encourages institutions of higher education and other nonprofit education or research organizations to develop and provide, either as individual institutions or in partnerships thereof, appropriate training and programs to assist Foundation-funded principal investigators at their institutions in achieving the goals of the Broader Impacts Review Criterion as described in subsection (a); and

(5) requires principal investigators applying for Foundation research grants to provide evidence of institutional support for the portion of the investigator’s proposal designed to satisfy the Broader Impacts Review Criterion, including evidence of relevant training, programs, and other institutional resources avail-

able to the investigator from either their home institution or organization or another institution or organization with relevant expertise.

SEC. 215. NATIONAL CENTER FOR SCIENCE AND ENGINEERING STATISTICS.

(a) **ESTABLISHMENT.**—There is established within the Foundation a National Center for Science and Engineering Statistics (in this section referred to as the “Center”), that shall serve as a central Federal clearinghouse for the collection, interpretation, analysis, and dissemination of objective data on science, engineering, technology, and research and development.

(b) **DUTIES.**—In carrying out subsection (a) of this section, the Director, acting through the Center shall—

(1) collect, acquire, analyze, report, and disseminate statistical data related to the science and engineering enterprise in the United States and other nations that is relevant and useful to practitioners, researchers, policymakers, and the public, including statistical data on—

(A) research and development trends;

(B) the science and engineering workforce;

(C) United States competitiveness in science, engineering, technology, and research and development; and

(D) the condition and progress of United States STEM education;

(2) support research using the data it collects, and on methodologies in areas related to the work of the Center; and

(3) support the education and training of researchers in the use of large-scale, nationally representative data sets.

(c) **STATISTICAL REPORTS.**—The Director or the National Science Board, acting through the Center, shall issue regular, and as necessary, special statistical reports on topics related to the national and international science and engineering enterprise such as the biennial report required by section 4 (j)(1) of the National Science Foundation Act of 1950 (42 U.S.C. 1863(j)(1)) on indicators of the state of science and engineering in the United States.

SEC. 216. COLLECTION OF DATA ON DEMOGRAPHICS OF FACULTY.

(a) **COLLECTION OF DATA.**—The Director shall report, in conjunction with the biennial report required under section 37 of the Science and Engineering Equal Opportunities Act (42 U.S.C. 19 1885d), statistical summary data on the demographics of STEM discipline faculty at institutions of higher education in the United States. At a minimum, the Director shall consider—

(1) the number and percent of faculty by gender, race, and age;

(2) the number and percent of faculty at each rank, by gender, race, and age;

(3) the number and percent of faculty who are in nontenure-track positions, including teaching and research, by gender, race, and age;

(4) the number of faculty who are reviewed for promotion, including tenure, and the percentage of that number who are promoted, by gender, race, and age;

(5) faculty years in rank by gender, race, and age;

(6) faculty attrition by gender, race, and age;

(7) the number and percent of faculty hired by rank, gender, race, and age; and

(8) the number and percent of faculty in leadership positions, including endowed or named chairs, serving on promotion and tenure committees, by gender, race, and age.

(b) **RECOMMENDATIONS.**—The Director shall solicit input and recommendations from relevant stakeholders, including representatives from institutions of higher education and nonprofit organizations, on the collection of data required under subsection (a), including the development of standard definitions on the terms and categories to be used in the collection of such data.

(c) **REPORT TO CONGRESS.**—Not later than 2 years after the date of enactment of this Act, the Director shall submit a report to Congress on how the Foundation will gather the demographic data on STEM faculty, including—

(1) a description of the data to be reported and the sources of those data;

(2) justification for the exclusion of any data described in paragraph (1); and

(3) a list of the definitions for the terms and categories, such as “faculty” and “leadership positions”, to be applied in the reporting of all data described in paragraph (1).

Subtitle B—Research and Innovation

SEC. 221. SUPPORT FOR POTENTIALLY TRANSFORMATIVE RESEARCH.

(a) **POLICY.**—The Director shall establish a policy that requires the Foundation to use at least 5 percent of its research budget to fund high-risk, high-reward basic research proposals. Support for facilities and infrastructure, including preconstruction design and operations and maintenance of major research facilities, shall not be counted as part of the research budget for the purposes of this section.

(b) **IMPLEMENTATION.**—In implementing such policy, the Foundation may—

- (1) develop solicitations specifically for high-risk, high-reward basic research;
- (2) establish review panels for the primary purpose of selecting high-risk, high-reward proposals or modify instructions to standard review panels to require identification of high-risk, high-reward proposals; and
- (3) support workshops and participate in conferences with the primary purpose of identifying new opportunities for high-risk, high-reward basic research, especially at interdisciplinary interfaces.

(c) **DEFINITION.**—For purposes of this section, the term “high-risk, high-reward basic research” means research driven by ideas that have the potential to radically change our understanding of an important existing scientific or engineering concept, or leading to the creation of a new paradigm or field of science or engineering, and that is characterized by its challenge to current understanding or its pathway to new frontiers.

SEC. 222. FACILITATING INTERDISCIPLINARY COLLABORATIONS FOR NATIONAL NEEDS.

(a) **IN GENERAL.**—The Director shall award competitive, merit-based awards in amounts not to exceed \$5,000,000 over a period of up to 5 years to interdisciplinary research collaborations that are likely to assist in addressing critical challenges to national security, competitiveness, and societal well-being and that—

- (1) involve at least 2 co-equal principal investigators at the same or different institutions;
- (2) draw upon well-integrated, diverse teams of investigators, including students or postdoctoral researchers, from one or more disciplines; and
- (3) foster creativity and pursue high-risk, high-reward research.

(b) **PRIORITY.**—In selecting grant recipients under this section, the Director shall give priority to applicants that propose to utilize advances in cyberinfrastructure and simulation-based science and engineering.

SEC. 223. NATIONAL SCIENCE FOUNDATION MANUFACTURING RESEARCH AND EDUCATION.

(a) **MANUFACTURING RESEARCH.**—The Director shall carry out a program to award merit-reviewed, competitive grants to institutions of higher education to support fundamental research leading to transformative advances in manufacturing technologies, processes, and enterprises that will support United States manufacturing through improved performance, productivity, sustainability, and competitiveness. Research areas may include—

- (1) nanomanufacturing;
- (2) manufacturing and construction machines and equipment, including robotics, automation, and other intelligent systems;
- (3) manufacturing enterprise systems;
- (4) advanced sensing and control techniques;
- (5) materials processing; and
- (6) information technologies for manufacturing, including predictive and real-time models and simulations, and virtual manufacturing.

(b) **MANUFACTURING EDUCATION.**—In order to help ensure a well-trained manufacturing workforce, the Director shall award grants to strengthen and expand scientific and technical education and training in advanced manufacturing, including through the Foundation’s Advanced Technological Education program.

SEC. 224. STRENGTHENING INSTITUTIONAL RESEARCH PARTNERSHIPS.

(a) **IN GENERAL.**—For any Foundation research grant, in an amount greater than \$2,000,000, to be carried out through a partnership that includes one or more minority-serving institutions or predominantly undergraduate institutions and one or more institutions described in subsection (b), the Director shall award funds directly, according to the budget justification described in the grant proposal, to at least two of the institutions of higher education in the partnership, including at least one minority-serving institution or one predominantly undergraduate institution, to ensure a strong and equitable partnership.

(b) **INSTITUTIONS.**—The institutions referred to in subsection (a) are institutions of higher education that are among the 100 institutions receiving, over the 3-year

period immediately preceding the awarding of grants, the highest amount of research funding from the Foundation.

SEC. 225. NATIONAL SCIENCE BOARD REPORT ON MID-SCALE INSTRUMENTATION.

(a) **MID-SCALE RESEARCH INSTRUMENTATION NEEDS.**—The National Science Board shall evaluate the needs, across all disciplines supported by the Foundation, for mid-scale research instrumentation that falls between the instruments funded by the Major Research Instrumentation program and the very large projects funded by the Major Research Equipment and Facilities Construction program.

(b) **REPORT ON MID-SCALE RESEARCH INSTRUMENTATION PROGRAM.**—Not later than 1 year after the date of enactment of this Act, the National Science Board shall submit to Congress a report on mid-scale research instrumentation at the Foundation. At a minimum, this report shall include—

(1) the findings from the Board's evaluation of instrumentation needs required under subsection (a), including a description of differences across disciplines and Foundation research directorates;

(2) a recommendation or recommendations regarding how the Foundation should set priorities for mid-scale instrumentation across disciplines and Foundation research directorates;

(3) a recommendation or recommendations regarding the appropriateness of expanding existing programs, including the Major Research Instrumentation program or the Major Research Equipment and Facilities Construction program, to support more instrumentation at the mid-scale;

(4) a recommendation or recommendations regarding the need for and appropriateness of a new, Foundation-wide program or initiative in support of mid-scale instrumentation, including any recommendations regarding the administration of and budget for such a program or initiative and the appropriate scope of instruments to be funded under such a program or initiative; and

(5) any recommendation or recommendations regarding other options for supporting mid-scale research instrumentation at the Foundation.

SEC. 226. SENSE OF CONGRESS ON OVERALL SUPPORT FOR RESEARCH INFRASTRUCTURE AT THE FOUNDATION.

It is the sense of Congress that the Foundation should strive to keep the percentage of the Foundation budget devoted to research infrastructure in the range of 24 to 27 percent, as recommended in the 2003 National Science Board report entitled "Science and Engineering Infrastructure for the 21st Century".

SEC. 227. PARTNERSHIPS FOR INNOVATION.

(a) **IN GENERAL.**—The Director shall carry out a program to award merit-reviewed, competitive grants to institutions of higher education to establish and to expand partnerships that promote innovation and increase the economic and social impact of research by developing tools and resources to connect new scientific discoveries to practical uses.

(b) **PARTNERSHIPS.**—

(1) **IN GENERAL.**—To be eligible for funding under this section, an institution of higher education must propose establishment of a partnership that—

(A) includes at least one private sector entity; and

(B) may include other institutions of higher education, public sector institutions, private sector entities, and social enterprise nonprofit organizations.

(2) **PRIORITY.**—In selecting grant recipients under this section, the Director shall give priority to partnerships that include one or more institutions of higher education that are among the 100 institutions receiving, over the 3-year period immediately preceding the awarding of grants, the highest amount of research funding from the Foundation and at least one of the following:

(A) A minority serving institution.

(B) A primarily undergraduate institution.

(C) A 2-year institution of higher education.

(c) **PROGRAM.**—Proposals funded under this section shall seek to—

(1) increase the economic or social impact of the most promising research at the institution or institutions of higher education that are members of the partnership through knowledge transfer or commercialization;

(2) increase the engagement of faculty and students across multiple disciplines and departments, including faculty and students in schools of business and other appropriate non-STEM fields and disciplines in knowledge transfer activities;

(3) enhance education and mentoring of students and faculty in innovation and entrepreneurship through networks, courses, and development of best practices and curricula;

- (4) strengthen the culture of the institution or institutions of higher education to undertake and participate in activities related to innovation and leading to economic or social impact;
 - (5) broaden the participation of all types of institutions of higher education in activities to meet STEM workforce needs and promote innovation and knowledge transfer; and
 - (6) build lasting partnerships with local and regional businesses, local and State governments, and other relevant entities.
- (d) **ADDITIONAL CRITERIA.**—In selecting grant recipients under this section, the Director shall also consider the extent to which the applicants are able to demonstrate evidence of institutional support for, and commitment to—
- (1) achieving the goals of the program as described in subsection (c);
 - (2) expansion to an institution-wide program if the initial proposal is not for an institution-wide program; and
 - (3) sustaining any new innovation tools and resources generated from funding under this program.
- (e) **LIMITATION.**—No funds provided under this section may be used to construct or renovate a building or structure.

SEC. 228. PRIZE AWARDS.

- (a) **SHORT TITLE.**—This section may be cited as the “Generating Extraordinary New Innovations in the United States Act of 2010”.
- (b) **IN GENERAL.**—The Director shall carry out a pilot program to award innovation inducement cash prizes in any area of research supported by the Foundation. The Director may carry out a program of cash prizes only in conformity with this section.
- (c) **TOPICS.**—In identifying topics for prize competitions under this section, the Director shall—
- (1) consult widely both within and outside the Federal Government;
 - (2) give priority to high-risk, high-reward research challenges and to problems whose solution could improve the economic competitiveness of the United States; and
 - (3) give consideration to the extent to which the topics have the potential to raise public awareness about federally sponsored research.
- (d) **TYPES OF CONTESTS.**—The Director shall consider all categories of innovation inducement prizes, including—
- (1) contests in which the award is to the first team or individual who accomplishes a stated objective; and
 - (2) contests in which the winner is the team or individual who comes closest to achieving an objective within a specified time.
- (e) **ADVERTISING AND ANNOUNCEMENT.**—
- (1) **ADVERTISING AND SOLICITATION OF COMPETITORS.**—The Director shall widely advertise prize competitions to encourage broad participation, including by individuals, institutions of higher education, nonprofit organizations, and businesses.
 - (2) **ANNOUNCEMENT THROUGH FEDERAL REGISTER NOTICE.**—The Director shall announce each prize competition by publishing a notice in the Federal Register. This notice shall include the subject of the competition, the duration of the competition, the eligibility requirements for participation in the competition, the process for participants to register for the competition, the amount of the prize, and the criteria for awarding the prize, including the method by which the prize winner or winners will be selected.
 - (3) **TIME TO ANNOUNCEMENT.**—The Director shall announce a prize competition within 18 months after receipt of appropriated funds.
- (f) **FUNDING.**—
- (1) **FUNDING SOURCES.**—Prizes under this section shall consist of Federal appropriated funds and any funds raised pursuant to donations authorized under section 11(f) of the National Science Foundation Act of 1950 (42 U.S.C. 1870(f)) for specific prize competitions.
 - (2) **ANNOUNCEMENT OF PRIZES.**—The Director may not issue a notice as required by subsection (e)(2) until all of the funds needed to pay out the announced amount of the prize have been appropriated or committed in writing by another entity pursuant to paragraph (1).
- (g) **ELIGIBILITY.**—To be eligible to win a prize under this section, an individual or entity—
- (1) shall have complied with all of the requirements under this section;
 - (2) in the case of a private entity, shall be incorporated in and maintain a primary place of business in the United States, and in the case of an individual, whether participating singly or in a group, shall be a United States citizen or

national, or an alien lawfully admitted to the United States for permanent residence;

(3) shall not be a Federal entity, a Federal employee acting within the scope of his or her employment, or a person employed at a Federal laboratory acting within the scope of his or her employment; and

(4) shall not have utilized Federal funds to engage in the research for which the prize is being awarded.

(h) AWARDS.—

(1) NUMBER OF COMPETITIONS.—The Director may announce up to 5 prize competitions through the end of fiscal year 2013.

(2) SIZE OF AWARD.—The Director may determine the amount of each prize award based on the prize topic, but no award shall be less than \$1,000,000 or greater than \$3,000,000.

(3) SELECTING WINNERS.—The Director may convene an expert panel to select a winner of a prize competition. If the panel is unable to select a winner, the Director shall determine the winner of the prize.

(4) PUBLIC OUTREACH.—The Director shall publicly award prizes utilizing the Foundation's existing public affairs and public outreach resources.

(i) ADMINISTERING THE COMPETITION.—The Director may enter into an agreement with a private, nonprofit entity to administer the prize competition, subject to the provisions of this section.

(j) INTELLECTUAL PROPERTY.—The Federal Government shall not, by virtue of offering or awarding a prize under this section, be entitled to any intellectual property rights derived as a consequence of, or in direct relation to, the participation by a registered participant in a competition authorized by this section. This subsection shall not be construed to prevent the Federal Government from negotiating a license for the use of intellectual property developed for a prize competition under this section.

(k) LIABILITY.—The Director may require a registered participant in a prize competition under this section to waive liability against the Federal Government for injuries and damages that result from participation in such competition.

(l) NONSUBSTITUTION.—Any programs created under this section shall not be considered a substitute for Federal research and development programs.

(m) REPORTING REQUIREMENT.—Not later than 5 years after the date of enactment of this Act, the National Science Board shall transmit to Congress a report containing the results of a review and assessment of the pilot program under this section, including—

(1) a description of the nature and status of all completed or ongoing prize competitions carried out under this section, including any scientific achievements, publications, intellectual property, or commercialized technology that resulted from such competitions;

(2) any recommendations regarding changes to, the termination of, or continuation of the pilot program;

(3) an analysis of whether the program is attracting contestants more diverse than the Foundation's traditional academic constituency;

(4) an analysis of whether public awareness of innovation or of the goal of the particular prize or prizes is enhanced;

(5) an analysis of whether the Foundation's public image or ability to increase public scientific literacy is enhanced through the use of innovation inducement prizes; and

(6) an analysis of the extent to which private funds are being used to support registered participants.

(n) EARLY TERMINATION OF CONTESTS.—The Director shall terminate a prize contest before any registered participant wins if the Director determines that an unregistered entity has produced an innovation that would otherwise have qualified for the prize award.

(o) AUTHORIZATION OF APPROPRIATIONS.—

(1) IN GENERAL.—

(A) AWARDS.—There are authorized to be appropriated to the Director for the period encompassing fiscal years 2011 through 2013 \$12,000,000 for carrying out this section.

(B) ADMINISTRATION.—Of the amounts authorized in subparagraph (A), not more than 15 percent for each fiscal year shall be available for the administrative costs of carrying out this section.

(2) CARRYOVER OF FUNDS.—Funds appropriated for prize awards under this section shall remain available until expended, and may be transferred, reprogrammed, or expended for other purposes as authorized by law only after the expiration of 7 fiscal years after the fiscal year for which the funds were originally appropriated. No provision in this section permits obligation or payment

of funds in violation of section 1341 of title 31 of the United States Code (commonly referred to as the Anti-Deficiency Act).

Subtitle C—STEM Education and Workforce Training

SEC. 241. GRADUATE STUDENT SUPPORT.

(a) FINDING.—The Congress finds that—

(1) the Integrative Graduate Education and Research Traineeship program is an important program for training the next generation of scientists and engineers in team-based interdisciplinary research and problem solving, and for providing them with the many additional skills, such as communication skills, needed to thrive in diverse STEM careers; and

(2) the Integrative Graduate Education and Research Traineeship program is no less valuable to the preparation and support of graduate students than the Foundation's Graduate Research Fellowship program.

(b) EQUAL TREATMENT OF IGERT AND GRF.—Beginning in fiscal year 2011, the Director shall increase or, if necessary, decrease funding for the Foundation's Integrative Graduate Education and Research Traineeship program (or any program by which it is replaced) at least at the same rate as it increases or decreases funding for the Graduate Research Fellowship program.

(c) SUPPORT FOR GRADUATE STUDENT RESEARCH FROM THE RESEARCH ACCOUNT.—For each of the fiscal years 2011 through 2015, at least 50 percent of the total Foundation funds allocated to the Integrative Graduate Education and Research Traineeship program and the Graduate Research Fellowship program shall come from funds appropriated for Research and Related Activities.

(d) COST OF EDUCATION ALLOWANCE FOR GRF PROGRAM.—Section 10 of the National Science Foundation Act of 1950 (42 U.S.C. 1869) is amended—

(1) by inserting “(a)” before “The Foundation is authorized”; and

(2) by adding at the end the following new subsection:

“(b) The Director shall establish for each year the amount to be awarded for scholarships and fellowships under this section for that year. Each such scholarship and fellowship shall include a cost of education allowance of \$12,000, subject to any restrictions on the use of cost of education allowance as determined by the Director.”.

SEC. 242. POSTDOCTORAL FELLOWSHIP IN STEM EDUCATION RESEARCH.

(a) IN GENERAL.—The Director shall establish postdoctoral fellowships in STEM education research to provide recent doctoral degree graduates in STEM fields with the necessary skills to assume leadership roles in STEM education research, program development, and evaluation in our Nation's diverse educational institutions.

(b) AWARDS.—

(1) DURATION.—Fellowships may be awarded under this section for a period of up to 24 months in duration, renewable for an additional 12 months. The Director shall establish criteria for eligibility for renewal of the fellowship.

(2) STIPEND.—The Director shall determine the amount of the award for a fellowship, which shall include a stipend and a research allowance, and may include an educational allowance.

(3) LOCATION.—A fellowship shall be awarded for research at any institution of higher education that offers degrees in fields supported by the Foundation, or at any institution or organization that the Director determines is eligible for education research grants from the Foundation.

(4) NUMBER OF AWARDS.—The Director may award up to 20 new fellowships per year.

(c) RESEARCH.—Fellowships under this section shall be awarded for research on STEM education at any educational level, including grades pre-K-12, undergraduate, graduate, and general public education, in both formal and informal settings. Research topics may include—

(1) learning processes and progressions;

(2) knowledge transfer, including curriculum development;

(3) uses of technology as teaching and learning tools;

(4) integrating STEM fields; and

(5) assessment of student learning and program evaluation.

(d) ELIGIBILITY.—To be eligible for a fellowship under this section, an individual must—

(1) be a United States citizen or national, or an alien lawfully admitted to the United States for permanent residence, at the time of application; and

(2) have received a doctoral degree in one of the STEM fields supported by the Foundation within 3 years prior to the fellowship application deadline.

SEC. 243. ROBERT NOYCE TEACHER SCHOLARSHIP PROGRAM.

Section 10A of the National Science Foundation Authorization Act of 2002 (42 U.S.C. 1862n-1a) is amended in subsection (h)(1) by—

- (1) striking “50” and inserting “30”; and
- (2) striking “which may be provided in cash or in-kind” and inserting “which shall be provided in cash”.

SEC. 244. INSTITUTIONS SERVING PERSONS WITH DISABILITIES.

For the purposes of the activities and programs supported by the Foundation, institutions of higher education chartered to serve large numbers of students with disabilities, including Gallaudet University, Landmark College, and the National Technical Institute for the Deaf, shall have a designation consistent with the designation for other institutions that serve populations underrepresented in STEM to ensure that institutions of higher education chartered to serve persons with disabilities can benefit from STEM bridge programs and from research partnerships with major research universities. Nothing in this section shall be construed to amend or otherwise affect any of the definitions for minority-serving institutions under title III or title V of the Higher Education Act of 1965.

SEC. 245. INSTITUTIONAL INTEGRATION.

(a) **INNOVATION THROUGH INSTITUTIONAL INTEGRATION.**—The Director shall award grants for the institutional integration of projects funded by the Foundation with a focus on education, or on broadening participation in STEM by underrepresented groups, for the purpose of increasing collaboration and coordination across funded projects and institutions and expanding the impact of such projects within and among institutions of higher education in an innovative and sustainable manner.

(b) **PROGRAM ACTIVITIES.**—The program under this section shall support integrative activities that involve the strategic and innovative combination of Foundation-funded projects and that provide for—

- (1) additional opportunities to increase the recruitment, retention, and degree attainment of underrepresented groups in STEM disciplines;
- (2) the inclusion of programming, practices, and policies that encourage the integration of education and research;
- (3) seamless transitions from one educational level to another; and
- (4) other activities that expand and deepen the impact of Foundation-funded projects with a focus on education, or on broadening participation in STEM by underrepresented groups, and enhance their sustainability.

(c) **REVIEW CRITERIA.**—In selecting recipients of grants under this section, the Director shall consider at a minimum—

- (1) the extent to which the proposed project addresses the goals of project and program integration and adds value to the existing funded projects;
- (2) the extent to which there is a proven record of success for the existing projects on which the proposed integration project is based; and
- (3) the extent to which the proposed project addresses the modification of programming, practices, and policies necessary to achieve the purpose described in subsection (a).

(d) **PRIORITY.**—In selecting recipients of grants under this section, the Director shall give priority to proposals for which a senior institutional administrator, including a dean or other administrator of equal or higher rank, serves as the principal investigator.

SEC. 246. POSTDOCTORAL RESEARCH FELLOWSHIPS.

(a) **IN GENERAL.**—The Director shall establish a Foundation-wide postdoctoral research fellowship program, to award competitive, merit-based postdoctoral research fellowships in any field of research supported by the Foundation.

(b) **DURATION AND AMOUNT.**—Fellowships may be awarded under this section for a period of up to 3 years in duration. The Director shall determine the amount of the award for a fellowship, which shall include a stipend and a research allowance, and may include an educational allowance.

(c) **ELIGIBILITY.**—To be eligible to receive a fellowship under this section, an individual—

- (1) must be a United States citizen or national, or an alien lawfully admitted to the United States for permanent residence, at the time of application;
- (2) must have received a doctoral degree in any field of research supported by the Foundation within 3 years prior to the fellowship application deadline, or will complete a doctoral degree no more than 1 year after the application deadline; and

- (3) may not have previously received funding as the principal investigator of a research grant from the Foundation, unless such funding was received as a graduate student.
- (d) PRIORITY.—In evaluating applications for fellowships under this section, the Director shall give priority to applications that include—
- (1) proposals for interdisciplinary research; or
 - (2) proposals for high-risk, high-reward research.
- (e) ADDITIONAL CONSIDERATIONS.—In evaluating applications for fellowships under this section, the Director shall give consideration to the goal of promoting the participation of individuals identified in section 33 or 34 of the Science and Engineering Equal Opportunities Act (42 U.S.C. 1885a or 1885b).
- (f) NONSUBSTITUTION.—The fellowship program authorized under this section is not intended to replace or reduce support for postdoctoral research through existing programs at the Foundation.

SEC. 247. BROADENING PARTICIPATION TRAINING AND OUTREACH.

The Director shall provide education and training—

- (1) to Foundation staff and grant proposal review panels on effective mechanisms and tools for broadening participation in STEM by underrepresented groups, including reviewer selection and mitigation of implicit bias in the review process; and
- (2) to Foundation staff on related outreach approaches.

SEC. 248. TRANSFORMING UNDERGRADUATE EDUCATION IN STEM.

Section 17 of the National Science Foundation Authorization Act of 2002 (42 U.S.C. 1862n–6) is amended to read as follows:

“SEC. 17. TRANSFORMING UNDERGRADUATE EDUCATION IN STEM.

“(a) IN GENERAL.—The Director shall award grants, on a competitive, merit-reviewed basis, to institutions of higher education (or to consortia thereof) to reform undergraduate STEM education for the purpose of increasing the number and quality of students studying toward and completing baccalaureate degrees in STEM and improving the STEM learning outcomes for all undergraduate students, including through—

“(1) development, implementation, and assessment of innovative, research-based approaches to transforming the teaching and learning of disciplinary or interdisciplinary STEM at the undergraduate level; and

“(2) expansion of successful STEM reform efforts beyond a single course or group of courses to achieve reform within an entire academic unit, or expansion of successful reform efforts beyond a single academic unit to other STEM academic units within an institution or to comparable academic units at other institutions.

“(b) USES OF FUNDS.—Activities supported by grants under this section may include—

“(1) creation of multidisciplinary or interdisciplinary courses or programs that formalize collaborations for the purpose of improved student instruction and research in STEM;

“(2) expansion of undergraduate STEM research opportunities to include interdisciplinary research opportunities and research opportunities in industry, at Federal labs, and at international research institutions or research sites;

“(3) implementation or expansion of bridge programs, including programs that address student transition from 2-year to 4-year institutions, and cohort, tutoring, or mentoring programs proven to enhance student recruitment or persistence to degree completion in STEM, including recruitment or persistence to degree completion of individuals identified in section 33 or 34 of the Science and Engineering Equal Opportunities Act (42 U.S.C. 1885a or 1885b);

“(4) improvement of undergraduate STEM education for nonmajors, including education majors;

“(5) implementation of evidence-based, technology-driven reform efforts that directly impact undergraduate STEM instruction or research experiences;

“(6) development and implementation of faculty and graduate teaching assistant development programs focused on improved instruction, mentoring, assessment of student learning, and support of undergraduate STEM students;

“(7) support for graduate students and postdoctoral fellows to participate in instructional or assessment activities at primarily undergraduate institutions;

“(8) research on teaching and learning of STEM at the undergraduate level related to the proposed reform effort, including assessment and evaluation of the proposed reform activities, research on scalability and sustainability of approaches to reform, and development and implementation of longitudinal studies of students included in the proposed reform effort; and

“(9) support for initiatives that advance the integration of global challenges such as sustainability into disciplinary and interdisciplinary STEM education.

“(c) PARTNERSHIP.—An institution of higher education may partner with one or more other nonprofit education or research organizations, including scientific and engineering societies, for the purposes of carrying out the activities authorized under this section.

“(d) SELECTION PROCESS.—

“(1) APPLICATIONS.—An institution of higher education seeking a grant under this section shall submit an application to the Director at such time, in such manner, and containing such information as the Director may require. The application shall include, at a minimum—

“(A) a description of the proposed reform effort;

“(B) a description of the research findings that will serve as the basis for the proposed reform effort or, in the case of applications that propose an expansion of a previously implemented reform effort, a description of the previously implemented reform effort, including indicators of success such as data on student recruitment, persistence to degree completion, and academic achievement;

“(C) evidence of institutional support for, and commitment to, the proposed reform effort, including long-term commitment to implement successful strategies from the current reform effort beyond the academic unit or units included in the grant proposal or to disseminate successful strategies to other institutions;

“(D) a description of existing or planned institutional policies and practices regarding faculty hiring, promotion, tenure, and teaching assignment that reward faculty contributions to undergraduate STEM education; and

“(E) a description of the plans for assessment and evaluation of the proposed reform activities, including evidence of participation by individuals with experience in assessment and evaluation of teaching and learning programs.

“(2) REVIEW OF APPLICATIONS.—In selecting grant recipients under this section, the Director shall consider at a minimum—

“(A) the likelihood of success in undertaking the proposed effort at the institution submitting the application, including the extent to which the faculty, staff, and administrators of the institution are committed to making the proposed institutional reform a priority of the participating academic unit or units;

“(B) the degree to which the proposed reform will contribute to change in institutional culture and policy such that a greater value is placed on faculty engagement in undergraduate education;

“(C) the likelihood that the institution will sustain or expand the reform beyond the period of the grant; and

“(D) the degree to which scholarly assessment and evaluation plans are included in the design of the reform effort, including the degree to which such assessment and evaluation contribute to the systematic accumulation of knowledge on STEM education.

“(3) PRIORITY.—For proposals that include an expansion of existing reform efforts beyond a single academic unit, the Director shall give priority to proposals for which a senior institutional administrator, including a dean or other administrator of equal or higher rank, serves as the principal investigator or a coprincipal investigator.

“(4) GRANT DISTRIBUTION.—The Director shall ensure, to the extent practicable, that grants awarded under this section are made to a variety of types of institutions of higher education.”

SEC. 249. 21ST CENTURY GRADUATE EDUCATION.

(a) IN GENERAL.—The Director shall award grants, on a competitive, merit-reviewed basis, to institutions of higher education to implement or expand research-based reforms in master’s and doctoral level STEM education that emphasize preparation for diverse careers utilizing STEM degrees, including at diverse types of institutions of higher education, in industry, and at government agencies and research laboratories.

(b) USES OF FUNDS.—Activities supported by grants under this section may include—

(1) creation of multidisciplinary or interdisciplinary courses or programs for the purpose of improved student instruction and research in STEM;

(2) expansion of graduate STEM research opportunities to include interdisciplinary research opportunities and research opportunities in industry, at

Federal laboratories, and at international research institutions or research sites;

(3) development and implementation of future faculty training programs focused on improved instruction, mentoring, assessment of student learning, and support of undergraduate STEM students;

(4) support and training for graduate students to participate in instructional activities beyond the traditional teaching assistantship, and especially as part of ongoing educational reform efforts, including at pre-K-12 schools, informal science education institutions, and primarily undergraduate institutions;

(5) creation, improvement, or expansion of innovative graduate programs such as science master's degree programs;

(6) development and implementation of seminars, workshops, and other professional development activities that increase the ability of graduate students to engage in innovation, technology transfer, and entrepreneurship;

(7) development and implementation of seminars, workshops, and other professional development activities that increase the ability of graduate students to effectively communicate their research findings to technical audiences outside of their own discipline and to nontechnical audiences;

(8) expansion of successful STEM reform efforts beyond a single academic unit to other STEM academic units within an institution or to comparable academic units at other institutions; and

(9) research on teaching and learning of STEM at the graduate level related to the proposed reform effort, including assessment and evaluation of the proposed reform activities and research on scalability and sustainability of approaches to reform.

(c) **PARTNERSHIP.**—An institution of higher education may partner with one or more other nonprofit education or research organizations, including scientific and engineering societies, for the purposes of carrying out the activities authorized under this section.

(d) **SELECTION PROCESS.**—

(1) **APPLICATIONS.**—An institution of higher education seeking a grant under this section shall submit an application to the Director at such time, in such manner, and containing such information as the Director may require. The application shall include, at a minimum—

(A) a description of the proposed reform effort;

(B) in the case of applications that propose an expansion of a previously implemented reform effort at the applicant's institution or at other institutions, a description of the previously implemented reform effort;

(C) evidence of institutional support for, and commitment to, the proposed reform effort, including long-term commitment to implement successful strategies from the current reform effort beyond the academic unit or units included in the grant proposal or to disseminate successful strategies to other institutions; and

(D) a description of the plans for assessment and evaluation of the grant proposed reform activities.

(2) **REVIEW OF APPLICATIONS.**—In selecting grant recipients under this section, the Director shall consider at a minimum—

(A) the likelihood of success in undertaking the proposed effort at the institution submitting the application, including the extent to which the faculty, staff, and administrators of the institution are committed to making the proposed institutional reform a priority of the participating academic unit or units;

(B) the degree to which the proposed reform will contribute to change in institutional culture and policy such that a greater value is placed on preparing graduate students for diverse careers utilizing STEM degrees;

(C) the likelihood that the institution will sustain or expand the reform beyond the period of the grant; and

(D) the degree to which scholarly assessment and evaluation plans are included in the design of the reform effort.

(e) **REPEAL.**—Section 7034 of the America COMPETES Act (42 U.S.C. 1862o–13) is repealed.

SEC. 250. UNDERGRADUATE BROADENING PARTICIPATION PROGRAM.

(a) **UNDERGRADUATE BROADENING PARTICIPATION PROGRAM.**—The Foundation shall continue to support the Historically Black Colleges and Universities Undergraduate Program, the Louis Stokes Alliances for Minority Participation program, and the Tribal Colleges and Universities Program as separate programs at least through September 30, 2011.

(b) **PLAN.**—Prior to any realignment or consolidation of the programs described in subsection (a), in addition to the Hispanic-Serving Institutions Undergraduate Program required by section 7033 of the America COMPETES Act (42 U.S.C. 1862o-12), the Director shall develop a plan clarifying the objectives and rationale for such changes. The plan shall include a description of how such changes would result in—

(1) meeting or strengthening the common goal of the separate programs to increase the number of individuals from underrepresented groups attaining undergraduate STEM degrees; and

(2) addressing the unique needs of the different types of minority serving institutions and underrepresented groups currently provided for by the separate programs.

(c) **RECOMMENDATIONS.**—In the development of the plan required under subsection (b), the Director shall at a minimum—

(1) consider the recommendations and findings of the National Academy of Sciences report required by section 7032 of the America COMPETES Act (Public Law 110-69); and

(2) solicit recommendations and feedback from a wide range of stakeholders, including representatives from minority serving institutions, other institutions of higher education, and other entities with expertise on effective mechanisms to increase the recruitment and retention of members of underrepresented groups in STEM fields, and the attainment of STEM degrees by underrepresented groups.

(d) **APPROVAL BY CONGRESS.**—The plan developed under this section shall be transmitted to Congress at least 3 months prior to the implementation of any realignment or consolidation of the programs described in subsection (a).

SEC. 251. GRAND CHALLENGES IN EDUCATION RESEARCH.

(a) **IN GENERAL.**—The Director and the Secretary of Education shall collaborate, in consultation with the Director of the National Institutes of Health, in—

(1) identifying, prioritizing, and developing strategies to address grand challenges in research and development on the teaching and learning of STEM at the pre-K-12 level, in formal and informal settings, for diverse learning populations, including individuals identified in section 33 or 34 of the Science and Engineering Equal Opportunities Act (42 U.S.C. 1885a or 1885b), and students in rural schools;

(2) carrying out research and development to address the grand challenges identified in paragraph (1); and

(3) ensuring the dissemination of the results of such research and development.

(b) **STAKEHOLDER INPUT.**—In identifying the grand challenges required in subsection (a), the Director and the Secretary shall—

(1) take into consideration critical research gaps identified in existing reports, including reports by the National Academies, on the teaching and learning of STEM at the pre-K-12 level in formal and informal settings; and

(2) solicit input from a wide range of stakeholders, including local and State education officials, STEM teachers, STEM education researchers, scientific and engineering societies, STEM faculty at institutions of higher education, informal STEM education providers, businesses with a large STEM workforce, and other stakeholders in the teaching and learning of STEM at the pre-K-12 level, and may enter into an arrangement with the National Research Council for these purposes.

(c) **TOPICS TO CONSIDER.**—In identifying the grand challenges required in subsection (a), the Director and the Secretary, in order to provide students with increased access to rigorous courses of study in STEM, increase the number of students who are prepared for advanced study and careers in STEM, and increase the effective teaching of STEM subjects, shall at a minimum consider the following topics:

(1) Research on scalability, sustainability, and replication of successful STEM activities, programs, and models, in formal and informal environments.

(2) Research that utilizes a systems approach to identifying challenges and opportunities to improve the teaching and learning of STEM, including development and evaluation of model systems that support improved teaching and learning of STEM across entire school districts and States, and encompassing and integrating the teaching and learning of STEM in formal and informal venues, and in K-12 schools and institutions of higher education.

(3) Research to understand what makes a STEM teacher effective and STEM teacher professional development effective, including development of tools and methodologies to measure STEM teacher effectiveness.

(4) Research and development on cyber-enabled tools and programs and television based tools and programs for learning and teaching STEM, including development of tools and methodologies for assessing cyber and television enabled teaching and learning.

(5) Research and development on STEM teaching and learning in informal environments, including development of tools and methodologies for assessing STEM teaching and learning in informal environments.

(6) Research and development on how integrating engineering with mathematics and science education may—

(A) improve student learning of mathematics and science;

(B) increase student interest and persistence in STEM; or

(C) improve student understanding of engineering design principles and of the built world.

(7) Research to understand what makes hands-on, inquiry-based classroom experiences effective, including development of tools and methodologies for assessing such experiences.

(d) REPORT TO CONGRESS.—Not later than 18 months after the date of enactment of this Act, the Director and the Secretary shall report back to Congress with a description of—

(1) the grand challenges identified pursuant to this section;

(2) the role of each agency in supporting research and development activities to address the grand challenges;

(3) the common metrics that will be used to assess progress toward meeting the grand challenges;

(4) plans for periodically updating the grand challenges;

(5) how the agencies will disseminate the results of research and development activities carried out under this section to STEM education practitioners, to other Federal agencies that support STEM programs and activities, and to non-Federal funders of STEM education; and

(6) how the agencies will support implementation of best practices identified by the research and development activities.

SEC. 252. RESEARCH EXPERIENCES FOR UNDERGRADUATES.

(a) RESEARCH SITES.—The Director shall award grants, on a merit-reviewed, competitive basis, to institutions of higher education, nonprofit organizations, or consortia of such institutions and organizations, for sites designated by the Director to provide research experiences for 10 or more undergraduate STEM students, with consideration given to the goal of promoting the participation of individuals identified in section 33 or 34 of the Science and Engineering Equal Opportunities Act (42 U.S.C. 1885a or 1885b). The Director shall ensure that—

(1) at least half of the students participating in a program funded by a grant under this subsection at each site shall be recruited from institutions of higher education where research opportunities in STEM are limited, including 2-year institutions;

(2) the awards provide undergraduate research experiences in a wide range of STEM disciplines;

(3) the awards support a variety of projects, including independent investigator-led projects, interdisciplinary projects, and multi-institutional projects (including virtual projects);

(4) students participating in each program funded have mentors, including during the academic year to the extent practicable, to help connect the students' research experiences to the overall academic course of study and to help students achieve success in courses of study leading to a baccalaureate degree in a STEM field;

(5) mentors and students are supported with appropriate salary or stipends; and

(6) student participants are tracked, for employment and continued matriculation in STEM fields, through receipt of the undergraduate degree and for at least 3 years thereafter.

(b) INCLUSION OF UNDERGRADUATES IN STANDARD RESEARCH GRANTS.—The Director shall require that every recipient of a research grant from the Foundation proposing to include 1 or more undergraduate students in carrying out the research under the grant shall request support, including stipend support, for such undergraduate students as part of the research proposal itself rather than as a supplement to the research proposal, unless such undergraduate participation was not foreseeable at the time of the original proposal.

SEC. 253. LABORATORY SCIENCE PILOT PROGRAM.

Section 7026 of the America COMPETES Act (Public Law 110–69) is amended by striking subsections (d) and (e).

SEC. 254. STEM INDUSTRY INTERNSHIP PROGRAMS.

(a) **IN GENERAL.**—The Director may award grants, on a competitive, merit-reviewed basis, to institutions of higher education, or consortia thereof, to establish or expand partnerships with local or regional private sector entities, for the purpose of providing undergraduate students with integrated internship experiences that connect private sector internship experiences with the students' STEM coursework. Such partnerships may also include industry or professional associations.

(b) **PRIORITY.**—In awarding grants under this section, the Director shall give priority to institutions of higher education or consortia thereof that demonstrate significant outreach to and coordination with local or regional private sector entities in developing academic courses designed to provide students with the skills necessary for employment in local or regional companies.

(c) **COST-SHARE.**—The Director shall require a 50 percent non-Federal cost-share from partnerships established or expanded under this section.

(d) **RESTRICTION.**—No Federal funds provided under this section may be used—

(1) for the purpose of providing stipends or compensation to students for private sector internships; or

(2) as payment or reimbursement to private sector entities.

(e) **REPORT.**—Not less than 3 years after the date of enactment of this Act, the Director shall submit a report to Congress on the number and total value of awards made under this section, the number of students affected by those awards, and any evidence of the effect of those awards on workforce preparation and jobs placement for participating students.

SEC. 255. TRIBAL COLLEGES AND UNIVERSITIES PROGRAM.

(a) **IN GENERAL.**—The Director shall continue to support a program to award grants on a competitive, merit-reviewed basis to tribal colleges and universities (as defined in section 316 of the Higher Education Act of 1965 (20 U.S.C. 1059c)), including institutions described in section 317 of such Act (20 U.S.C. 1059d), to enhance the quality of undergraduate STEM education at such institutions and to increase the retention and graduation rates of Native American students pursuing associate's or baccalaureate degrees in STEM.

(b) **PROGRAM COMPONENTS.**—Grants awarded under this section shall support—

(1) activities to improve courses and curriculum in STEM;

(2) faculty development;

(3) stipends for undergraduate students participating in research; and

(4) other activities consistent with subsection (a), as determined by the Director.

(c) **INSTRUMENTATION.**—Funding provided under this section may be used for instrumentation.

TITLE III—STEM EDUCATION**SEC. 301. COORDINATION OF FEDERAL STEM EDUCATION.**

(a) **SHORT TITLE.**—This section may be cited as the “STEM Education Coordination Act of 2010”.

(b) **DEFINITION.**—In this section, the term “STEM” means science, technology, engineering, and mathematics.

(c) **ESTABLISHMENT.**—The Director of the Office of Science and Technology Policy shall establish a committee under the National Science and Technology Council with the responsibility to coordinate Federal programs and activities in support of STEM education, including at the National Science Foundation, the Department of Energy, the National Aeronautics and Space Administration, the National Oceanic and Atmospheric Administration, the Department of Education, and all other Federal agencies that have programs and activities in support of STEM education.

(d) **RESPONSIBILITIES OF THE COMMITTEE.**—The committee established under subsection (c) shall—

(1) coordinate the STEM education activities and programs of the Federal agencies;

(2) develop, implement through the participating agencies, and update once every 5 years a 5-year STEM education strategic plan, which shall—

(A) specify and prioritize annual and long-term objectives;

(B) specify the common metrics that will be used to assess progress toward achieving the objectives;

(C) describe the approaches that will be taken by each participating agency to assess the effectiveness of its STEM education programs and activities; and

- (D) with respect to subparagraph (A), describe the role of each agency in supporting programs and activities designed to achieve the objectives; and
- (3) establish, periodically update, and maintain an inventory of federally sponsored STEM education programs and activities, including documentation of assessments of the effectiveness of such programs and activities and rates of participation by underrepresented minorities in such programs and activities.
- (e) RESPONSIBILITIES OF OSTP.—The Director of the Office of Science and Technology Policy shall encourage and monitor the efforts of the participating agencies to ensure that the strategic plan under subsection (d)(2) is developed and executed effectively and that the objectives of the strategic plan are met.
- (f) REPORT.—The Director of the Office of Science and Technology Policy shall transmit a report annually to Congress at the time of the President's budget request describing the plan required under subsection (d)(2). The annual report shall include—
- (1) a description of the STEM education programs and activities for the previous and current fiscal years, and the proposed programs and activities under the President's budget request, of each participating Federal agency;
 - (2) the levels of funding for each participating Federal agency for the programs and activities described under paragraph (1) for the previous fiscal year and under the President's budget request;
 - (3) except for the initial annual report, a description of the progress made in carrying out the implementation plan, including a description of the outcome of any program assessments completed in the previous year, and any changes made to that plan since the previous annual report; and
 - (4) a description of how the participating Federal agencies will disseminate information about federally supported resources for STEM education practitioners, including teacher professional development programs, to States and to STEM education practitioners, including to teachers and administrators in high-need schools, as defined in section 200 of the Higher Education Act of 1965 (20 U.S.C. 1021).

SEC. 302. ADVISORY COMMITTEE ON STEM EDUCATION.

- (a) IN GENERAL.—The President shall establish or designate an advisory committee on science, technology, engineering, and mathematics (STEM) education.
- (b) MEMBERSHIP.—The advisory committee established or designated by the President under subsection (a) shall be chaired by at least 2 members of the President's Council of Advisors on Science and Technology, with the remaining advisory committee membership consisting of non-Federal members who are specially qualified to provide the President with advice and information on STEM education. Membership of the advisory committee, at a minimum, shall include individuals from the following categories of individuals and organizations:
- (1) STEM educator professional associations.
 - (2) Organizations that provide informal STEM education activities.
 - (3) Institutions of higher education.
 - (4) Scientific and engineering professional societies.
 - (5) Business and industry associations.
 - (6) Foundations that fund STEM education activities.
- (c) RESPONSIBILITIES.—The responsibilities of the advisory committee shall include—
- (1) soliciting input from teachers, administrators, local education agencies, States, and other public and private STEM education stakeholder groups for the purpose of informing the Federal agencies that support STEM education programs on the STEM education needs of States and school districts;
 - (2) soliciting input from all STEM education stakeholder groups regarding STEM education programs, including STEM education research programs, supported by Federal agencies;
 - (3) providing advice to the Federal agencies that support STEM education programs on how their programs can be better aligned with the needs of States and school districts as identified in paragraph (1), consistent with the mission of each agency; and
 - (4) offering guidance to the President on current STEM education activities, research findings, and best practices, with the purpose of increasing connectivity between public and private STEM education efforts.

SEC. 303. STEM EDUCATION AT THE DEPARTMENT OF ENERGY.

- (a) DEFINITIONS.—Section 5002 of the America COMPETES Act (42 U.S.C. 16531) is amended—
- (1) by redesignating paragraphs (2) through (4) as paragraphs (3) through (5), respectively; and
 - (2) by inserting after paragraph (1) the following new paragraph:

“(2) ENERGY SYSTEMS SCIENCE AND ENGINEERING.—The term ‘energy systems science and engineering’ means—

- “(A) nuclear science and engineering, including—
 - “(i) nuclear engineering;
 - “(ii) nuclear chemistry;
 - “(iii) radiochemistry; and
 - “(iv) health physics;
- “(B) hydrocarbon system science and engineering, including—
 - “(i) petroleum or reservoir engineering;
 - “(ii) environmental geoscience;
 - “(iii) petrophysics;
 - “(iv) geophysics;
 - “(v) geochemistry;
 - “(vi) petroleum geology;
 - “(vii) ocean engineering;
 - “(viii) environmental engineering; and
 - “(ix) carbon capture and sequestration science and engineering;
- “(C) energy efficiency and renewable energy technology systems science and engineering, including with respect to—
 - “(i) solar technology systems;
 - “(ii) wind technology systems;
 - “(iii) buildings technology systems;
 - “(iv) transportation technology systems;
 - “(v) hydropower systems; and
 - “(vi) geothermal systems; and
- “(D) energy storage and distribution systems science and engineering, including with respect to—
 - “(i) energy storage; and
 - “(ii) energy delivery.”.

(b) SCIENCE, TECHNOLOGY, ENGINEERING, AND MATHEMATICS EDUCATION PROGRAMS.—Subpart B of the Department of Energy Science Education Enhancement Act (42 U.S.C. 7381g et seq.) is amended—

(1) in section 3170—

(A) by amending paragraph (1) to read as follows:

“(1) DIRECTOR.—The term ‘Director’ means the Director of STEM Education appointed or designated under section 3171(c)(1).”;

(B) by redesignating paragraph (2) as paragraph (3);

(C) by inserting after paragraph (1) the following new paragraph:

“(2) ENERGY SYSTEMS SCIENCE AND ENGINEERING.—The term ‘energy systems science and engineering’ means—

- “(A) nuclear science and engineering, including—
 - “(i) nuclear engineering;
 - “(ii) nuclear chemistry;
 - “(iii) radiochemistry; and
 - “(iv) health physics;
- “(B) hydrocarbon system science and engineering, including—
 - “(i) petroleum or reservoir engineering;
 - “(ii) environmental geoscience;
 - “(iii) petrophysics;
 - “(iv) geophysics;
 - “(v) geochemistry;
 - “(vi) petroleum geology;
 - “(vii) ocean engineering; and
 - “(viii) environmental engineering;
- “(C) energy efficiency and renewable energy technology systems science and engineering, including with respect to—
 - “(i) solar technology systems;
 - “(ii) wind technology systems;
 - “(iii) buildings technology systems;
 - “(iv) transportation technology systems;
 - “(v) hydropower systems; and
 - “(vi) geothermal systems; and
- “(D) energy storage and distribution systems science and engineering, including with respect to—
 - “(i) energy storage; and
 - “(ii) energy delivery.”; and

(D) by adding at the end the following new paragraph:

“(4) STEM.—The term ‘STEM’ means science, technology, engineering, and mathematics.”;

- (2) by striking chapters 1, 2, 3, 4, and 6;
- (3) by inserting after section 3170 the following new chapter:

“CHAPTER 1—STEM EDUCATION

“SEC. 3171. STEM EDUCATION.

“(a) **IN GENERAL.**—The Secretary of Energy shall develop, conduct, support, promote, and coordinate formal and informal educational activities that leverage the Department’s unique content expertise and facilities to contribute to improving STEM education at all levels in the United States, and to enhance awareness and understanding of STEM, including energy sciences, in order to create a diverse skilled scientific and technical workforce essential to meeting the challenges facing the Department and the Nation in the 21st century.

“(b) **PROGRAMS.**—The Secretary shall carry out evidence-based programs designed to increase student interest and participation, improve public literacy and support, and improve the teaching and learning of energy systems science and engineering and other STEM disciplines supported by the Department. Programs authorized under this subsection may include—

“(1) informal educational programming designed to excite and inspire students and the general public about energy systems science and engineering and other STEM disciplines supported by the Department, while strengthening their content knowledge in these fields;

“(2) teacher training and professional development opportunities for pre-service and in-service elementary and secondary teachers designed to increase the content knowledge of teachers in energy systems science and engineering and other STEM disciplines supported by the Department, including through hands-on research experiences;

“(3) research opportunities for secondary school students, including internships at the National Laboratories, that provide secondary school students with hands-on research experiences as well as exposure to working scientists;

“(4) research opportunities at the National Laboratories for undergraduate and graduate students pursuing degrees in energy systems science and engineering and other STEM disciplines supported by the Department; and

“(5) competitive scholarships, fellowships, and traineeships for undergraduate and graduate students in energy systems science and engineering and other STEM disciplines supported by the Department.

“(c) **ORGANIZATION OF STEM EDUCATION PROGRAMS.**—

“(1) **DIRECTOR OF STEM EDUCATION.**—The Secretary shall appoint or designate a Director of STEM Education, who shall have the principal responsibility to oversee and coordinate all programs and activities of the Department in support of STEM education, including energy systems science and engineering education, across all functions of the Department.

“(2) **QUALIFICATIONS.**—The Director shall be an individual, who by reason of professional background and experience, is specially qualified to advise the Secretary on all matters pertaining to STEM education, including energy systems science and engineering education, at the Department.

“(3) **DUTIES.**—The Director shall—

“(A) oversee and coordinate all programs in support of STEM education, including energy systems science and engineering education, across all functions of the Department;

“(B) represent the Department as the principal interagency liaison for all STEM education programs, unless otherwise represented by the Secretary, the Under Secretary for Science, or the Under Secretary for Energy;

“(C) prepare the annual budget and advise the Under Secretary for Science and the Under Secretary for Energy on all budgetary issues for STEM education, including energy systems science and engineering education, relative to the programs of the Department;

“(D) establish, periodically update, and maintain a publicly accessible online inventory of STEM education programs and activities, including energy systems science and engineering education programs and activities;

“(E) develop, implement, and update the Department of Energy STEM education strategic plan, as required by subsection (d);

“(F) increase, to the maximum extent practicable, the participation and advancement of women and underrepresented minorities at every level of STEM education, including energy systems science and engineering education; and

“(G) perform such other matters relating to STEM education as are required by the Secretary, the Under Secretary for Science, or the Under Secretary for Energy.

“(d) DEPARTMENT OF ENERGY STEM EDUCATION STRATEGIC PLAN.—The Director of STEM education appointed or designated under subsection (c)(1) shall develop, implement, and update once every 3 years a 3-year STEM education strategic plan for the Department, which shall—

“(1) identify and prioritize annual and long-term STEM education goals and objectives for the Department that are aligned with the overall goals of the National Science and Technology Council Committee on STEM Education Strategic plan required under section 301(d)(2) of the STEM Education Coordination Act of 2010;

“(2) describe the role of each program or activity of the Department in contributing to the goals and objectives identified under paragraph (1);

“(3) specify the metrics that will be used to assess progress toward achieving those goals and objectives; and

“(4) describe the approaches that will be taken to assess the effectiveness of each STEM education program and activity supported by the Department.

“(e) OUTREACH TO STUDENTS FROM UNDERREPRESENTED GROUPS.—In carrying out a program authorized under this section, the Secretary shall give consideration to the goal of promoting the participation of individuals identified in section 33 or 34 of the Science and Engineering Equal Opportunities Act (42 U.S.C. 1885a or 1885b).

“(f) CONSULTATION AND PARTNERSHIP WITH OTHER AGENCIES.—In carrying out the programs and activities authorized under this section, the Secretary shall—

“(1) consult with the Secretary of Education and the Director of the National Science Foundation regarding activities designed to improve elementary and secondary STEM education; and

“(2) consult and partner with the Director of the National Science Foundation in carrying out programs under this section designed to build capacity in STEM education at the undergraduate and graduate level, including by supporting excellent proposals in energy systems science and engineering that are submitted for funding to the Foundation’s Advanced Technological Education Program.”; and

(4) in section 3191—

(A) in subsection (a)—

(i) by striking “web-based” and inserting “, through a publicly available website,” ; and

(ii) by inserting “and project-based learning opportunities” after “laboratory experiments”;

(B) in subsection (b)(1), by inserting “, including energy systems science and engineering” after “the science of energy”; and

(C) by striking subsection (d).

(c) ENERGY APPLIED SCIENCE TALENT EXPANSION PROGRAM FOR INSTITUTIONS OF HIGHER EDUCATION.—

(1) AMENDMENT.—Strike sections 5004 and 5005 of the America COMPETES Act (42 U.S.C. 16532 and 16533) and insert the following new section:

“**SEC. 5004. ENERGY APPLIED SCIENCE TALENT EXPANSION PROGRAM FOR INSTITUTIONS OF HIGHER EDUCATION.**

“(a) PURPOSES.—The purposes of this section are—

“(1) to address the decline in the number of and resources available to energy systems science and engineering programs at institutions of higher education, including community colleges; and

“(2) to increase the number of graduates with degrees in energy systems science and engineering, an area of strategic importance to the economic competitiveness and energy security of the United States.

“(b) ESTABLISHMENT.—The Secretary shall award grants, on a competitive, merit-reviewed basis, to institutions of higher education to implement or expand the energy systems science and engineering educational and technical training capabilities of the institution, and to provide merit-based financial support for master’s and doctoral level students pursuing courses of study and research in energy systems sciences and engineering.

“(c) USE OF FUNDS.—An institution of higher education that receives a grant under this section may use the grant to—

“(1) provide traineeships, including stipends and cost of education allowances, to master’s and doctoral students;

“(2) develop or expand multidisciplinary or interdisciplinary courses or programs;

“(3) recruit and retain new faculty;

“(4) develop or improve core and specialized course content;

“(5) encourage interdisciplinary and multidisciplinary research collaborations;

“(6) support outreach efforts to recruit students, including individuals identified in section 33 or 34 of the Science and Engineering Equal Opportunities Act (42 U.S.C. 1885a or 1885b); and

“(7) pursue opportunities for collaboration with industry and National Laboratories.

“(d) CRITERIA.—Criteria for awarding a grant under this section shall be based on—

“(1) the potential to attract new students to the program;

“(2) academic rigor; and

“(3) the ability to offer hands-on education and training opportunities for graduate students in the emerging areas of energy systems science and engineering.

“(e) PRIORITY.—The Secretary shall give priority to proposals that involve active partnerships with a National Laboratory or other energy systems science and engineering related entity, as determined by the Secretary.

“(f) DURATION AND AMOUNT.—

“(1) DURATION.—A grant under this section may be for up to 5 years in duration.

“(2) AMOUNT.—An institution of higher education that receives a grant under this section shall be eligible for up to \$1,000,000 for each year of the grant period.

“(g) AUTHORIZATION OF APPROPRIATIONS.—There are authorized to be appropriated to the Secretary to carry out this section—

“(1) \$30,000,000 for fiscal year 2011;

“(2) \$32,000,000 for fiscal year 2012;

“(3) \$36,000,000 for fiscal year 2013;

“(4) \$38,000,000 for fiscal year 2014; and

“(5) \$40,000,000 for fiscal year 2015.”

(2) CONFORMING AMENDMENT.—The table of contents for the America COMPETES Act is amended by striking the items relating to sections 5004 and 5005 and inserting the following:

Sec. 5004. Energy applied science talent expansion program for institutions of higher education.

(d) DEPARTMENT OF ENERGY EARLY CAREER AWARDS FOR SCIENCE, ENGINEERING, AND MATHEMATICS RESEARCHERS.—Section 5006 of the America COMPETES Act (42 U.S.C. 16534) is amended—

(1) in subsection (a), by striking “Director of the Office” and all that follows through “shall carry” and inserting “Secretary shall carry”;

(2) in subsection (b)(1)—

(A) in subparagraph (A), by inserting “per year” after “\$80,000”; and

(B) in subparagraph (B), by striking “\$125,000” and inserting “\$175,000 per year”;

(3) in subsection (c)(1), by striking “, as determined by the Director”;

(4) in subsections (c)(2), (e), (f), and (g), by striking “Director” each place it appears and inserting “Secretary”;

(5) in subsection (d), by striking “merit-reviewed” and inserting “merit-based, peer reviewed”; and

(6) in subsection (h)—

(A) by striking “, acting through the Director,”; and

(B) by striking “\$25,000,000 for each of fiscal years 2008 through 2010” and inserting “such sums as are necessary”.

(e) PROTECTING AMERICA’S COMPETITIVE EDGE (PACE) GRADUATE FELLOWSHIP PROGRAM.—Section 5009 of the America COMPETES Act (42 U.S.C. 16536) is amended—

(1) in subsection (c)—

(A) in paragraph (1), by striking “involving written and oral interviews, that will result in a wide distribution of awards throughout the United States,”; and

(B) in paragraph (2)(B)(iv), by striking “verbal and”;

(2) in subsection (d)(1)(B)(i), by inserting “partial or full” before “graduate tuition”; and

(3) by striking subsection (f).

(f) REPEAL.—Section 3164 of the Department of Energy Science Education Enhancement Act (42 U.S.C. 7381a) is repealed.

SEC. 304. GREEN ENERGY EDUCATION.

(a) SHORT TITLE.—This section may be cited as the “Green Energy Education Act of 2010”.

(b) DEFINITION.—For the purposes of this section:

- (1) **DIRECTOR.**—The term “Director” means the Director of the National Science Foundation.
- (2) **HIGH PERFORMANCE BUILDING.**—The term “high performance building” has the meaning given that term in section 914(a) of the Energy Policy Act of 2005 (42 U.S.C. 16194(a)).
- (c) **GRADUATE TRAINING IN ENERGY RESEARCH AND DEVELOPMENT.**—
- (1) **FUNDING.**—In carrying out research, development, demonstration, and commercial application activities authorized for the Department of Energy, the Secretary may contribute funds to the National Science Foundation for the Integrative Graduate Education and Research Traineeship program to support projects that enable graduate education related to such activities.
- (2) **CONSULTATION.**—The Director shall consult with the Secretary when preparing solicitations and awarding grants for projects described in paragraph (1).
- (d) **CURRICULUM DEVELOPMENT FOR HIGH PERFORMANCE BUILDING DESIGN.**—
- (1) **FUNDING.**—In carrying out advanced energy technology research, development, demonstration, and commercial application activities authorized for the Department of Energy related to high performance buildings, the Secretary may contribute funds to curriculum development activities at the National Science Foundation for the purpose of improving undergraduate or graduate interdisciplinary engineering and architecture education related to the design and construction of high performance buildings, including development of curricula, of laboratory activities, of training practicums, or of design projects. A primary goal of curriculum development activities supported under this subsection shall be to improve the ability of engineers, architects, landscape architects, and planners to work together on the incorporation of advanced energy technologies during the design and construction of high performance buildings.
- (2) **CONSULTATION.**—The Director shall consult with the Secretary when preparing solicitations and awarding grants for projects described in paragraph (1).
- (3) **PRIORITY.**—In awarding grants with respect to which the Secretary has contributed funds under this subsection, the Director shall give priority to applications from departments, programs, or centers of a school of engineering that are partnered with schools, departments, or programs of design, architecture, landscape architecture, and city, regional, or urban planning.

TITLE IV—NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY

SEC. 401. SHORT TITLE.

This title may be cited as the “National Institute of Standards and Technology Authorization Act of 2010”.

SEC. 402. AUTHORIZATION OF APPROPRIATIONS.

- (a) **FISCAL YEAR 2011.**—
- (1) **IN GENERAL.**—There are authorized to be appropriated to the Secretary of Commerce \$991,100,000 for the National Institute of Standards and Technology for fiscal year 2011.
- (2) **SPECIFIC ALLOCATIONS.**—Of the amount authorized under paragraph (1)—
- (A) \$620,000,000 shall be authorized for scientific and technical research and services laboratory activities;
- (B) \$125,000,000 shall be authorized for the construction and maintenance of facilities; and
- (C) \$246,100,000 shall be authorized for industrial technology services activities, of which—
- (i) \$95,000,000 shall be authorized for the Technology Innovation Program under section 28 of the National Institute of Standards and Technology Act (15 U.S.C. 278n);
- (ii) \$141,100,000 shall be authorized for the Manufacturing Extension Partnership program under sections 25 and 26 of such Act (15 U.S.C. 278k and 278l); and
- (iii) \$10,000,000 shall be authorized for the Malcolm Baldrige National Quality Award program under section 17 of the Stevenson-Wydler Technology Innovation Act of 1980 (15 U.S.C. 3711a).
- (b) **FISCAL YEAR 2012.**—
- (1) **IN GENERAL.**—There are authorized to be appropriated to the Secretary of Commerce \$992,400,000 for the National Institute of Standards and Technology for fiscal year 2012.
- (2) **SPECIFIC ALLOCATIONS.**—Of the amount authorized under paragraph (1)—

(A) \$657,200,000 shall be authorized for scientific and technical research and services laboratory activities;

(B) \$85,000,000 shall be authorized for the construction and maintenance of facilities; and

(C) \$250,200,000 shall be authorized for industrial technology services activities, of which—

(i) \$89,000,000 shall be authorized for the Technology Innovation Program under section 28 of the National Institute of Standards and Technology Act (15 U.S.C. 278n);

(ii) \$150,900,000 shall be authorized for the Manufacturing Extension Partnership program under sections 25 and 26 of such Act (15 U.S.C. 278k and 278l); and

(iii) \$10,300,000 shall be authorized for the Malcolm Baldrige National Quality Award program under section 17 of the Stevenson-Wydler Technology Innovation Act of 1980 (15 U.S.C. 3711a).

(c) FISCAL YEAR 2013.—

(1) IN GENERAL.—There are authorized to be appropriated to the Secretary of Commerce \$1,079,809,000 for the National Institute of Standards and Technology for fiscal year 2013.

(2) SPECIFIC ALLOCATIONS.—Of the amount authorized under paragraph (1)—

(A) \$696,700,000 shall be authorized for scientific and technical research and services laboratory activities;

(B) \$122,000,000 shall be authorized for the construction and maintenance of facilities; and

(C) \$261,109,000 shall be authorized for industrial technology services activities, of which—

(i) \$89,000,000 shall be authorized for the Technology Innovation Program under section 28 of the National Institute of Standards and Technology Act (15 U.S.C. 278n);

(ii) \$161,500,000 shall be authorized for the Manufacturing Extension Partnership program under sections 25 and 26 of such Act (15 U.S.C. 278k and 278l); and

(iii) \$10,609,000 shall be authorized for the Malcolm Baldrige National Quality Award program under section 17 of the Stevenson-Wydler Technology Innovation Act of 1980 (15 U.S.C. 3711a).

(d) FISCAL YEAR 2014.—

(1) IN GENERAL.—There are authorized to be appropriated to the Secretary of Commerce \$1,126,227,000 for the National Institute of Standards and Technology for fiscal year 2014.

(2) SPECIFIC ALLOCATIONS.—Of the amount authorized under paragraph (1)—

(A) \$738,500,000 shall be authorized for scientific and technical research and services laboratory activities;

(B) \$124,000,000 shall be authorized for the construction and maintenance of facilities; and

(C) \$263,727,000 shall be authorized for industrial technology services activities, of which—

(i) \$80,000,000 shall be authorized for the Technology Innovation Program under section 28 of the National Institute of Standards and Technology Act (15 U.S.C. 278n);

(ii) \$172,800,000 shall be authorized for the Manufacturing Extension Partnership program under sections 25 and 26 of such Act (15 U.S.C. 278k and 278l); and

(iii) \$10,927,000 shall be authorized for the Malcolm Baldrige National Quality Award program under section 17 of the Stevenson-Wydler Technology Innovation Act of 1980 (15 U.S.C. 3711a).

(e) FISCAL YEAR 2015.—

(1) IN GENERAL.—There are authorized to be appropriated to the Secretary of Commerce \$1,191,955,000 for the National Institute of Standards and Technology for fiscal year 2015.

(2) SPECIFIC ALLOCATIONS.—Of the amount authorized under paragraph (1)—

(A) \$782,800,000 shall be authorized for scientific and technical research and services laboratory activities;

(B) \$133,000,000 shall be authorized for the construction and maintenance of facilities; and

(C) \$276,155,000 shall be authorized for industrial technology services activities, of which—

(i) \$80,000,000 shall be authorized for the Technology Innovation Program under section 28 of the National Institute of Standards and Technology Act (15 U.S.C. 278n);

(ii) \$184,900,000 shall be authorized for the Manufacturing Extension Partnership program under sections 25 and 26 of such Act (15 U.S.C. 278k and 278l); and

(iii) \$11,255,000 shall be authorized for the Malcolm Baldrige National Quality Award program under section 17 of the Stevenson-Wydler Technology Innovation Act of 1980 (15 U.S.C. 3711a).

SEC. 403. UNDER SECRETARY OF COMMERCE FOR STANDARDS AND TECHNOLOGY.

(a) ESTABLISHMENT.—Section 4 of the National Institute of Standards and Technology Act is amended to read as follows:

“SEC. 4. UNDER SECRETARY OF COMMERCE FOR STANDARDS AND TECHNOLOGY.

“(a) ESTABLISHMENT.—There shall be in the Department of Commerce an Under Secretary of Commerce for Standards and Technology (in this section referred to as the ‘Under Secretary’).

“(b) APPOINTMENT.—The Under Secretary shall be appointed by the President by and with the advice and consent of the Senate.

“(c) COMPENSATION.—The Under Secretary shall be compensated at the rate in effect for level III of the Executive Schedule under section 5314 of title 5, United States Code.

“(d) DUTIES.—The Under Secretary shall serve as the Director of the Institute and shall perform such duties as required of the Director by the Secretary under this Act or by law.

“(e) APPLICABILITY.—The individual serving as the Director of the Institute on the date of enactment of the National Institute of Standards and Technology Authorization Act of 2010 shall also serve as the Under Secretary until such time as a successor is appointed under subsection (b).”.

(b) CONFORMING AMENDMENTS.—

(1) TITLE 5, UNITED STATES CODE.—

(A) LEVEL III.—Section 5314 of title 5, United States Code, is amended by inserting before the item “Associate Attorney General” the following:

“Under Secretary of Commerce for Standards and Technology, who also serves as Director of the National Institute of Standards and Technology.”.

(B) LEVEL IV.—Section 5315 of title 5, United States Code, is amended by striking “Director, National Institute of Standards and Technology, Department of Commerce.”.

(2) NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY ACT.—Section 5 of the National Institute of Standards and Technology Act (15 U.S.C. 274) is amended by striking the first, fifth, and sixth sentences.

SEC. 404. REORGANIZATION OF NIST LABORATORIES.

(a) ORGANIZATION.—The Director shall reorganize the scientific and technical research and services laboratory program into the following operational units:

(1) The Physical Measurement Laboratory, whose mission is to realize and disseminate the national standards for length, mass, time and frequency, electricity, temperature, force, and radiation by activities including fundamental research in measurement science, the provision of measurement services and standards, and the provision of testing facilities resources for use by the Federal Government.

(2) The Information Technology Laboratory, whose mission is to develop and disseminate standards, measurements, and testing capabilities for interoperability, security, usability, and reliability of information technologies, including cyber security standards and guidelines for Federal agencies, United States industry, and the public, through fundamental and applied research in computer science, mathematics, and statistics.

(3) The Engineering Laboratory, whose mission is to develop and disseminate advanced manufacturing and construction technologies to the United States manufacturing and construction industries through activities including measurement science research, performance metrics, tools for engineering applications, and promotion of standards adoption.

(4) The Material Measurement Laboratory, whose mission is to serve as the national reference laboratory in biological, chemical, and material sciences and engineering through activities including fundamental research in the composition, structure, and properties of biological and environmental materials and processes, the development of certified reference materials and critically evaluated data, and other programs to assure measurement quality in materials and biotechnology fields.

(5) The Center for Nanoscale Science and Technology, a national shared-use facility for nanoscale fabrication and measurement, whose mission is to develop innovative nanoscale measurement and fabrication capabilities to support re-

searchers from industry, institutions of higher education, the National Institute of Standards and Technology, and other Federal agencies in nanoscale technology from discovery to production.

(6) The NIST Center for Neutron Research, a national user facility, whose mission is to provide neutron-based measurement capabilities to researchers from industry, institutions of higher education, the National Institute of Standards and Technology, and other Federal agencies in support of materials research, nondestructive evaluation, neutron imaging, chemical analysis, neutron standards, dosimetry, and radiation metrology.

(b) **ADDITIONAL DUTIES.**—The Director may assign additional duties to the operational units listed in subsection (a) that are consistent with the missions of such units.

(c) **REVISION.**—

(1) **IN GENERAL.**—Subsequent to the reorganization required under subsection (a), the Director may revise the organization of the scientific and technical research and services laboratory program.

(2) **REPORT TO CONGRESS.**—Any revision to the organization of such program under paragraph (1) shall be submitted in a report to the Committee on Science and Technology of the House of Representatives and the Committee on Commerce, Science, and Transportation of the Senate at least 60 days before the effective date of such revision.

SEC. 405. FEDERAL GOVERNMENT STANDARDS AND CONFORMITY ASSESSMENT COORDINATION.

(a) **COORDINATION.**—Section 2(b) of the National Institute of Standards and Technology Act (15 U.S.C. 272(b)) is amended—

(1) in paragraph (12), by striking “and” after the semicolon;

(2) in paragraph (13), by striking the period at the end and inserting a semicolon; and

(3) by adding after paragraph (13) the following:

“(14) to promote collaboration among Federal departments and agencies and private sector stakeholders in the development and implementation of standards and conformity assessment frameworks to address specific Federal Government policy goals; and

“(15) to convene Federal departments and agencies, as appropriate, to—

“(A) coordinate and determine Federal Government positions on specific policy issues related to the development of international technical standards and conformity assessment-related activities; and

“(B) coordinate Federal department and agency engagement in the development of international technical standards and conformity assessment-related activities.”

(b) **REPORT.**—The Director, in consultation with appropriate Federal agencies, shall submit a report annually to Congress addressing the Federal Government’s technical standards and conformity assessment-related activities. The report shall identify—

(1) current and anticipated international standards and conformity assessment-related issues that have the potential to impact the competitiveness and innovation capabilities of the United States;

(2) any action being taken by the Federal Government to address these issues and the Federal agency taking that action; and

(3) any action that the Director is taking or will take to ensure effective Federal Government engagement on technical standards and conformity assessment-related issues, as appropriate, where the Federal Government is not effectively engaged.

SEC. 406. MANUFACTURING EXTENSION PARTNERSHIP.

(a) **COMMUNITY COLLEGE SUPPORT.**—Section 25(a) of the National Institute of Standards and Technology Act (15 U.S.C. 278k(a)) is amended—

(1) in paragraph (4), by striking “and” after the semicolon;

(2) in paragraph (5), by striking the period at the end and inserting “; and”; and

(3) by adding after paragraph (5) the following:

“(6) providing to community colleges information about the job skills needed in small- and medium-sized manufacturing businesses in the regions they serve.”

(b) **INNOVATIVE SERVICES INITIATIVE.**—Section 25 of such Act (15 U.S.C. 278k) is amended by adding at the end the following:

“(g) **INNOVATIVE SERVICES INITIATIVE.**—

“(1) ESTABLISHMENT.—The Director may establish, within the Centers program under this section, an innovative services initiative to assist small- and medium-sized manufacturers in—

“(A) reducing their energy usage and environmental waste to improve profitability; and

“(B) accelerating the domestic commercialization of new product technologies, including components for renewable energy systems.

“(2) MARKET DEMAND.—The Director may not undertake any activity to accelerate the domestic commercialization of a new product technology under this subsection unless an analysis of market demand for the new product technology has been conducted.”

(c) REPORTS.—Section 25 of such Act (15 U.S.C. 278k) is further amended by adding after subsection (g), as added by subsection (b), the following:

“(h) REPORTS.—

“(1) IN GENERAL.—In submitting the 3-year programmatic planning document and annual updates under section 23, the Director shall include an assessment of the Director’s governance of the program established under this section.

“(2) CRITERIA.—In conducting such assessment, the Director shall use the criteria established pursuant to the Malcolm Baldrige National Quality Award under section 17(d)(1)(C) of the Stevenson-Wydler Technology Innovation Act of 1980 (15 U.S.C. 3711a(d)(1)(C)).”

(d) HOLLINGS MANUFACTURING EXTENSION PARTNERSHIP PROGRAM COST-SHARING.—Section 25(c) of such Act (15 U.S.C. 278k(e)) is amended by adding at the end the following:

“(7) Notwithstanding paragraphs (1), (3), and (5), for fiscal year 2011 through fiscal year 2015, the Secretary may not provide to a Center more than 50 percent of the costs incurred by such Center and may not require that a Center’s cost share exceed 50 percent.

“(8) Not later than 4 years after the date of enactment of the National Institute of Standards and Technology Authorization Act of 2010, the Secretary shall submit to Congress a report on the cost share requirements under the program. The report shall—

“(A) discuss various cost share structures, including the cost share structure in place prior to such date of enactment and the cost share structure in place under paragraph (7), and the effect of such cost share structures on individual Centers and the overall program; and

“(B) include a recommendation for how best to structure the cost share requirement after fiscal year 2015 to provide for the long-term sustainability of the program.”

(e) ADVISORY BOARD.—Section 25(e)(4) of such Act (15 U.S.C. 278k(e)(4)) is amended to read as follows:

“(4) FEDERAL ADVISORY COMMITTEE ACT APPLICABILITY.—

“(A) IN GENERAL.—In discharging its duties under this subsection, the MEP Advisory Board shall function solely in an advisory capacity, in accordance with the Federal Advisory Committee Act.

“(B) EXCEPTION.—Section 14 of the Federal Advisory Committee Act shall not apply to the MEP Advisory Board.”

(f) DEFINITIONS.—Section 25 of such Act (15 U.S.C. 278k) is further amended by adding after subsection (h), as added by subsection (c), the following:

“(i) DEFINITION.—In this section, the term ‘community college’ means an institution of higher education (as defined under section 101(a) of the Higher Education Act of 1965 (20 U.S.C. 1001(a))) at which the highest degree that is predominately awarded to students is an associate’s degree.”

SEC. 407. BIOSCIENCE RESEARCH PROGRAM.

(a) IN GENERAL.—The National Institute of Standards and Technology Act (15 U.S.C. 271 et seq.) is amended—

(1) by redesignating section 34 as section 35; and

(2) by inserting after section 33 the following:

“SEC. 34. BIOSCIENCE RESEARCH PROGRAM.

“(a) IN GENERAL.—The Director shall establish a bioscience research program to support research and development of standard reference materials, measurements, methods, and genomic and other data to advance—

“(1) biological drug research and development;

“(2) molecular diagnostics;

“(3) medical imaging technologies; and

“(4) personalized medicine.

“(b) UNIVERSITY RESEARCH CENTERS.—

“(1) ESTABLISHMENT.—The Director may establish research centers at institutions of higher education (in this section referred to as ‘university research centers’) through a competitive application process to conduct research that furthers the objectives of the bioscience research program.

“(2) APPLICATION.—

“(A) IN GENERAL.—An institution of higher education seeking to establish a university research center under this subsection shall submit an application to the Director at such time, in such manner, and containing such information and assurances as the Director may require.

“(B) COMPONENTS.—The application shall include, at a minimum, a description of—

“(i) the relevant research and instructional capacity of the applicant;

“(ii) the research projects that will be undertaken by the applicant;

“(iii) the extent to which the applicant will partner with industry and the role industry will play in the research undertaken by the university research center;

“(iv) how the applicant will disseminate research results effectively; and

“(v) the metrics that will be used to evaluate the success of the projects under clause (ii) and the contribution of the university research center in furthering the objectives of the bioscience research program.

“(C) SPECIAL CONSIDERATION.—The Director shall give special consideration to an application from an institution of higher education that is—

“(i) an 1890 Institution, as defined in section 2 of the Agricultural Research, Extension, and Education Reform Act of 1998 (7 U.S.C. 7061);

“(ii) a Predominantly Black Institution, as defined in section 318 of the Higher Education Act of 1965 (20 U.S.C. 1059e);

“(iii) a part B institution, as defined in section 322 of the Higher Education Act of 1965 (20 U.S.C. 1061);

“(iv) a Tribal College or University, as defined in section 316 of the Higher Education Act of 1965 (20 U.S.C. 1059c);

“(v) a Native American-serving, nontribal institution, as defined in section 319 of the Higher Education Act of 1965 (20 U.S.C. 1059f);

“(vi) an Asian American and Native American Pacific Islander-serving institution, as defined in section 320 of the Higher Education Act of 1965 (20 U.S.C. 1059g);

“(vii) an Alaska Native-serving institution, as defined in section 317 of the Higher Education Act of 1965 (20 U.S.C. 1059d);

“(viii) a Native Hawaiian-serving institution, as defined in section 317 of the Higher Education Act of 1965 (20 U.S.C. 1059d); or

“(ix) a Hispanic-serving institution, as defined in section 502 of the Higher Education Act of 1965 (20 U.S.C. 1101a).

“(3) ASSESSMENT.—Not later than 3 years after the date on which a university research center is established and every 3 years thereafter, the Director shall evaluate the university research center for its contributions to the bioscience research program.

“(4) ANNUAL MEETING.—If the Director establishes more than 1 university research center, the Director shall convene an annual meeting of researchers from all of the university research centers and the Institute to foster collaboration and communication.

“(c) USER FACILITY.—The Director may establish a bioscience user facility to provide access to advanced or unique equipment, services, materials, and other resources to industry, institutions of higher education, nonprofit organizations, and government agencies to perform research and testing.

“(d) POSTDOCTORAL FELLOWS.—The Director shall, to the extent practicable, assign 1 or more fellows from the postdoctoral fellowship program established in section 19 to the bioscience research program.

“(e) PROGRAMMATIC PLANNING DOCUMENT.—The Director shall ensure that the updates to the programmatic planning document transmitted to Congress under section 23(d) include the bioscience research program.

“(f) DEFINITIONS.—In this section:

“(1) BIOSCIENCE RESEARCH PROGRAM.—The term ‘bioscience research program’ means the research and development program authorized under subsection (a).

“(2) INSTITUTION OF HIGHER EDUCATION.—The term ‘institution of higher education’ has the same meaning given the term in section 101(a) of the Higher Education Act of 1965 (20 U.S.C. 1001(a)).”.

(b) VISITING COMMITTEE ON ADVANCED TECHNOLOGY AMENDMENTS.—Section 10 of the National Institute of Standards and Technology Act (15 U.S.C. 278) is amended—

(1) in subsection (a)—

(A) by striking “15 members” and inserting “at least 15, but not more than 20, members”; and

(B) by striking “at least 10” and inserting “at least 13”; and

(2) in subsection (h)(1), by striking “Program established under section 28” and inserting “programs established under sections 28 and 34”.

SEC. 408. EMERGENCY COMMUNICATION AND TRACKING TECHNOLOGIES RESEARCH INITIATIVE.

(a) ESTABLISHMENT.—The Director shall establish a research initiative to support the development of emergency communication and tracking technologies for use in locating trapped individuals in confined spaces, such as underground mines, and other shielded environments, such as high-rise buildings or collapsed structures, where conventional radio communication is limited.

(b) ACTIVITIES.—In order to carry out this section, the Director shall work with the private sector and appropriate Federal agencies to—

(1) perform a needs assessment to identify and evaluate the measurement, technical standards, and conformity assessment needs required to improve the operation and reliability of such emergency communication and tracking technologies; and

(2) support the development of technical standards and conformance architecture to improve the operation and reliability of such emergency communication and tracking technologies.

(c) REPORT.—Not later than 18 months after the date of enactment of this Act, the Director shall submit to Congress and make publicly available a report describing the assessment performed under subsection (b)(1) and making recommendations about research priorities to address gaps in the measurement, technical standards, and conformity assessment needs identified by such assessment.

SEC. 409. TIP ADVISORY BOARD.

Section 28(k)(4) of the National Institute of Standards and Technology Act (15 U.S.C. 278n(k)(4)) is amended to read as follows:

“(4) FEDERAL ADVISORY COMMITTEE ACT APPLICABILITY.—

“(A) IN GENERAL.—In discharging its duties under this subsection, the TIP Advisory Board shall function solely in an advisory capacity, in accordance with the Federal Advisory Committee Act.

“(B) EXCEPTION.—Section 14 of the Federal Advisory Committee Act shall not apply to the TIP Advisory Board.”.

SEC. 410. UNDERREPRESENTED MINORITIES.

(a) RESEARCH FELLOWSHIPS.—Section 18 of the National Institute of Standards and Technology Act (15 U.S.C. 278g-1) is amended by adding at the end the following:

“(c) UNDERREPRESENTED MINORITIES.—In evaluating applications for fellowships under this section, the Director shall give consideration to the goal of promoting the participation of underrepresented minorities in research areas supported by the Institute.”.

(b) POSTDOCTORAL FELLOWSHIP PROGRAM.—Section 19 of such Act (15 U.S.C. 278g-2) is amended by adding at the end the following: “In evaluating applications for fellowships under this section, the Director shall give consideration to the goal of promoting the participation of underrepresented minorities in research areas supported by the Institute.”.

(c) TEACHER DEVELOPMENT.—Section 19A(c) of such Act (15 U.S.C. 278g-2a(c)) is amended by adding at the end the following: “The Director shall give special consideration to an application from a teacher from a high-need school, as defined in section 200 of the Higher Education Act of 1965 (20 U.S.C. 1021).”.

SEC. 411. CYBER SECURITY STANDARDS AND GUIDELINES.

Cyber security standards and guidelines developed by the National Institute of Standards and Technology for use by United States industry and the public shall be voluntary.

SEC. 412. DEFINITIONS.

In this title:

(1) DIRECTOR.—The term “Director” means the Director of the National Institute of Standards and Technology.

(2) **FEDERAL AGENCY.**—The term “Federal agency” has the meaning given such term in section 4 of the Stevenson-Wydler Technology Innovation Act of 1980 (15 U.S.C. 3703).

TITLE V—INNOVATION

SEC. 501. OFFICE OF INNOVATION AND ENTREPRENEURSHIP.

The Stevenson-Wydler Technology Innovation Act of 1980 (15 U.S.C. 3701 et seq.) is amended by adding at the end the following new section:

“SEC. 24. OFFICE OF INNOVATION AND ENTREPRENEURSHIP.

“(a) **IN GENERAL.**—The Secretary shall establish an Office of Innovation and Entrepreneurship to foster innovation and the commercialization of new technologies, products, processes, and services with the goal of promoting productivity and economic growth in the United States.

“(b) **DUTIES.**—The Office of Innovation and Entrepreneurship shall be responsible for—

“(1) developing and advocating policies to accelerate innovation and advance the commercialization of research and development, including federally funded research and development;

“(2) identifying existing barriers to innovation and commercialization, including access to capital and other resources, and ways to overcome those barriers;

“(3) providing access to relevant data, research, and technical assistance on innovation and commercialization;

“(4) strengthening collaboration on and coordination of policies relating to innovation and commercialization within the Department of Commerce and between the Department of Commerce and other Federal agencies, as appropriate; and

“(5) any other duties as determined by the Secretary.

“(c) **ADVISORY COMMITTEE.**—The Secretary shall establish an Advisory Council on Innovation and Entrepreneurship to provide advice to the Secretary on carrying out subsection (b).”

SEC. 502. FEDERAL LOAN GUARANTEES FOR INNOVATIVE TECHNOLOGIES IN MANUFACTURING.

The Stevenson-Wydler Technology Innovation Act of 1980 (15 U.S.C. 3701 et seq.) is further amended by adding after section 24, as added by section 501 of this title, the following new section:

“SEC. 25. FEDERAL LOAN GUARANTEES FOR INNOVATIVE TECHNOLOGIES IN MANUFACTURING.

“(a) **ESTABLISHMENT.**—The Secretary shall establish a program to provide loan guarantees for obligations to small- or medium-sized manufacturers for the use or production of innovative technologies.

“(b) **ELIGIBLE PROJECTS.**—A loan guarantee may be made under such program only for a project that reequips, expands, or establishes a manufacturing facility in the United States to—

“(1) use an innovative technology or an innovative process in manufacturing;

or

“(2) manufacture an innovative technology product or an integral component of such product.

“(c) **ELIGIBLE BORROWER.**—A loan guarantee may be made under such program only for a borrower who is a small- or medium-sized manufacturer, as determined by the Secretary under the criteria established pursuant to subsection (m).

“(d) **LIMITATION ON AMOUNT.**—A loan guarantee shall not exceed an amount equal to 80 percent of the obligation, as estimated at the time at which the loan guarantee is issued.

“(e) **LIMITATIONS ON LOAN GUARANTEE.**—No loan guarantee shall be made unless the Secretary determines that—

“(1) there is a reasonable prospect of repayment of the principal and interest on the obligation by the borrower;

“(2) the amount of the obligation (when combined with amounts available to the borrower from other sources) is sufficient to carry out the project;

“(3) the obligation is not subordinate to other financing;

“(4) the obligation bears interest at a rate that does not exceed a level that the Secretary determines appropriate, taking into account the prevailing rate of interest in the private sector for similar loans and risks; and

“(5) the term of an obligation requires full repayment over a period not to exceed the lesser of—

- “(A) 30 years; or
 - “(B) 90 percent of the projected useful life, as determined by the Secretary, of the physical asset to be financed by the obligation.
- “(f) DEFAULTS.—
- “(1) PAYMENT BY SECRETARY.—
 - “(A) IN GENERAL.—If a borrower defaults (as defined in regulations promulgated by the Secretary and specified in the loan guarantee) on the obligation, the holder of the loan guarantee shall have the right to demand payment of the unpaid amount from the Secretary.
 - “(B) PAYMENT REQUIRED.—Within such period as may be specified in the loan guarantee or related agreements, the Secretary shall pay to the holder of the loan guarantee the unpaid interest on and unpaid principal of the obligation as to which the borrower has defaulted, unless the Secretary finds that there was no default by the borrower in the payment of interest or principal or that the default has been remedied.
 - “(C) FORBEARANCE.—Nothing in this subsection precludes any forbearance by the holder of the obligation for the benefit of the borrower which may be agreed upon by the parties to the obligation and approved by the Secretary.
 - “(2) SUBROGATION.—
 - “(A) IN GENERAL.—If the Secretary makes a payment under paragraph (1), the Secretary shall be subrogated to the rights, as specified in the loan guarantee, of the recipient of the payment or related agreements including, if appropriate, the authority (notwithstanding any other provision of law) to—
 - “(i) complete, maintain, operate, lease, or otherwise dispose of any property acquired pursuant to such loan guarantee or related agreement; or
 - “(ii) permit the borrower, pursuant to an agreement with the Secretary, to continue to pursue the purposes of the project if the Secretary determines that such an agreement is in the public interest.
 - “(B) SUPERIORITY OF RIGHTS.—The rights of the Secretary, with respect to any property acquired pursuant to a loan guarantee or related agreements, shall be superior to the rights of any other person with respect to the property.
 - “(3) ACTION BY ATTORNEY GENERAL.—
 - “(A) NOTIFICATION.—If the borrower defaults on an obligation, the Secretary shall notify the Attorney General of the default.
 - “(B) RECOVERY.—On notification, the Attorney General shall take such action as is appropriate to recover the unpaid principal and interest.
- “(g) PAYMENT OF PRINCIPAL AND INTEREST BY SECRETARY.—With respect to any obligation guaranteed under this section, the Secretary may enter into a contract to pay, and pay, holders of the obligation for and on behalf of the borrower from funds appropriated for that purpose the principal and interest payments that become due and payable on the unpaid balance of the obligation if the Secretary finds that—
- “(1)(A) the borrower is unable to make the payments and is not in default;
 - “(B) it is in the public interest to permit the borrower to continue to pursue the project; and
 - “(C) the probable net benefit to the Federal Government in paying the principal and interest will be greater than that which would result in the event of a default;
- “(2) the amount of the payment that the Secretary is authorized to pay shall be no greater than the amount of principal and interest that the borrower is obligated to pay under the obligation being guaranteed; and
 - “(3) the borrower agrees to reimburse the Secretary for the payment (including interest) on terms and conditions that are satisfactory to the Secretary.
- “(h) TERMS AND CONDITIONS.—A loan guarantee under this section shall include such detailed terms and conditions as the Secretary determines appropriate to—
- “(1) protect the interests of the United States in the case of default; and
 - “(2) have available all the patents and technology necessary for any person selected, including the Secretary, to complete and operate the project.
- “(i) CONSULTATION.—In establishing the terms and conditions of a loan guarantee under this section, the Secretary shall consult with the Secretary of the Treasury.
- “(j) FEES.—
- “(1) IN GENERAL.—The Secretary shall charge and collect fees for loan guarantees in amounts the Secretary determines are sufficient to cover applicable administrative expenses.
 - “(2) AVAILABILITY.—Fees collected under this subsection shall—

“(A) be deposited by the Secretary into the Treasury of the United States; and

“(B) remain available until expended, subject to such other conditions as are contained in annual appropriations Acts.

“(k) RECORDS.—

“(1) IN GENERAL.—With respect to a loan guarantee under this section, the borrower, the lender, and any other appropriate party shall keep such records and other pertinent documents as the Secretary shall prescribe by regulation, including such records as the Secretary may require to facilitate an effective audit.

“(2) ACCESS.—The Secretary and the Comptroller General of the United States, or their duly authorized representatives, shall have access to records and other pertinent documents for the purpose of conducting an audit.

“(l) FULL FAITH AND CREDIT.—The full faith and credit of the United States is pledged to the payment of all loan guarantees issued under this section with respect to principal and interest.

“(m) REGULATIONS.—The Secretary shall issue final regulations before making any loan guarantees under the program. Such regulations shall include—

“(1) criteria that the Secretary shall use to determine eligibility for loan guarantees under this section, including—

“(A) whether a borrower is a small- or medium-sized manufacturer; and

“(B) whether a borrower demonstrates that a market exists for the innovative technology product, or the integral component of such product, to be manufactured, as evidenced by written statements of interest from potential purchasers;

“(2) policies and procedures for selecting and monitoring lenders and loan performance; and

“(3) any other policies, procedures, or information necessary to implement this section.

“(n) AUDIT.—

“(1) ANNUAL INDEPENDENT AUDITS.—The Secretary shall enter into an arrangement with an independent auditor for annual evaluations of the program under this section.

“(2) ANNUAL REVIEW.—The Comptroller General shall conduct an annual review of the Secretary’s execution of the program under this section.

“(3) REPORT.—The results of the independent audit under paragraph (1) and the Comptroller General’s review under paragraph (2) shall be provided directly to the Committee on Science and Technology of the House of Representatives and the Committee on Commerce, Science, and Transportation of the Senate.

“(o) REPORT TO CONGRESS.—Concurrent with the submission to Congress of the President’s annual budget request in each year after the date of enactment of this section, the Secretary shall transmit to the Committee on Science and Technology of the House of Representatives and the Committee on Commerce, Science, and Transportation of the Senate a report containing a summary of all activities carried out under this section.

“(p) COORDINATION AND NONDUPLICATION.—To the maximum extent practicable, the Secretary shall ensure that the activities carried out under this section are coordinated with, and do not duplicate the efforts of, other loan guarantee programs within the Federal Government.

“(q) MEP CENTERS.—The Secretary may use centers established under section 25 of the National Institute of Standards and Technology Act (15 U.S.C. 278k) to provide information about the program established under this section and to conduct outreach to potential borrowers, as appropriate.

“(r) MINIMIZING RISK.—The Secretary shall promulgate regulations and policies to carry out this section in accordance with Office of Management and Budget Circular No. A-129, entitled ‘Policies for Federal Credit Programs and Non-Tax Receivables’, as in effect on the date of enactment of this section.

“(s) SENSE OF CONGRESS.—It is the sense of Congress that no loan guarantee shall be made under this section unless the borrower agrees to use a federally-approved electronic employment eligibility verification system to verify the employment eligibility of—

“(1) all persons hired during the contract term by the borrower to perform employment duties within the United States; and

“(2) all persons assigned by the borrower to perform work within the United States on the project.

“(t) DEFINITIONS.—In this section:

“(1) COST.—The term ‘cost’ has the meaning given such term under section 502 of the Federal Credit Reform Act of 1990 (2 U.S.C. 661a).

“(2) INNOVATIVE PROCESS.—The term ‘innovative process’ means a process that is significantly improved as compared to the process in general use in the commercial marketplace in the United States at the time the loan guarantee is issued.

“(3) INNOVATIVE TECHNOLOGY.—The term ‘innovative technology’ means a technology that is significantly improved as compared to the technology in general use in the commercial marketplace in the United States at the time the loan guarantee is issued.

“(4) LOAN GUARANTEE.—The term ‘loan guarantee’ has the meaning given such term in section 502 of the Federal Credit Reform Act of 1990 (2 U.S.C. 661a). The term includes a loan guarantee commitment (as defined in section 502 of such Act (2 U.S.C. 661a)).

“(5) OBLIGATION.—The term ‘obligation’ means the loan or other debt obligation that is guaranteed under this section.

“(6) PROGRAM.—The term ‘program’ means the loan guarantee program established in subsection (a).

“(u) AUTHORIZATION OF APPROPRIATIONS.—

“(1) COST OF LOAN GUARANTEES.—There are authorized to be appropriated \$50,000,000 for each of fiscal years 2011 through 2015 to provide the cost of loan guarantees under this section.

“(2) PRINCIPAL AND INTEREST.—There are authorized to be appropriated such sums as are necessary to carry out subsection (g).”.

SEC. 503. REGIONAL INNOVATION PROGRAM.

The Stevenson-Wydler Technology Innovation Act of 1980 (15 U.S.C. 3701 et seq.) is further amended by adding after section 25, as added by section 502 of this title, the following new section:

“SEC. 26. REGIONAL INNOVATION PROGRAM.

“(a) ESTABLISHMENT.—The Secretary shall establish a regional innovation program to encourage and support the development of regional innovation strategies, including regional innovation clusters.

“(b) REGIONAL INNOVATION CLUSTER GRANTS.—

“(1) IN GENERAL.—As part of the program established under subsection (a), the Secretary may award grants on a competitive basis to eligible recipients for activities relating to the formation and development of regional innovation clusters.

“(2) PERMISSIBLE ACTIVITIES.—Grants awarded under this subsection may be used for activities determined appropriate by the Secretary, including the following:

“(A) Feasibility studies.

“(B) Planning activities.

“(C) Technical assistance.

“(D) Developing or strengthening communication and collaboration between and among participants of a regional innovation cluster.

“(E) Attracting additional participants to a regional innovation cluster.

“(F) Facilitating market development of products and services developed by a regional innovation cluster, including through demonstration, deployment, technology transfer, and commercialization activities.

“(G) Developing relationships between a regional innovation cluster and entities or clusters in other regions.

“(3) ELIGIBLE RECIPIENT.—For purposes of this subsection, the term ‘eligible recipient’ means any of the following:

“(A) A State.

“(B) An Indian tribe.

“(C) A city or other political subdivision of a State.

“(D) An entity that—

“(i) is a nonprofit organization, an institution of higher education, a public-private partnership, or an economic development organization or similar entity; and

“(ii) has an application that is supported by a State or a political subdivision of a State.

“(E) A consortium of any of the entities listed in subparagraphs (A) through (D).

“(4) APPLICATION.—

“(A) IN GENERAL.—An eligible recipient shall submit an application to the Secretary at such time, in such manner, and containing such information and assurances as the Secretary may require.

“(B) COMPONENTS.—The application shall include, at a minimum, a description of the regional innovation cluster supported by the proposed activity, including a description of the following:

“(i) Whether the regional innovation cluster is supported by the private sector, State and local governments, and other relevant stakeholders.

“(ii) How the existing participants in the regional innovation cluster will encourage and solicit participation by all types of entities that might benefit from participation, including newly formed entities and those rival to existing participants.

“(iii) The extent to which the regional innovation cluster is likely to stimulate innovation and have a positive impact on regional economic growth and development.

“(iv) Whether the participants in the regional innovation cluster have access to, or contribute to, a well-trained workforce.

“(v) Whether the participants in the regional innovation cluster are capable of attracting additional funds from non-Federal sources.

“(vi) The likelihood that the participants in the regional innovation cluster will be able to sustain activities once grant funds under this subsection have been expended.

“(5) COST SHARE.—The Secretary may not provide more than 50 percent of the total cost of any activity funded under this subsection.

“(6) USE AND APPLICATION OF RESEARCH AND INFORMATION PROGRAM.—To the maximum extent practicable, the Secretary shall ensure that activities funded under this subsection use and apply any relevant research, best practices, and metrics developed under the program established in subsection (c).

“(c) REGIONAL INNOVATION RESEARCH AND INFORMATION PROGRAM.—

“(1) IN GENERAL.—As part of the program established under subsection (a), the Secretary shall establish a regional innovation research and information program to—

“(A) gather, analyze, and disseminate information on best practices for regional innovation strategies (including regional innovation clusters), including information relating to how innovation, productivity, and economic development can be maximized through such strategies;

“(B) provide technical assistance, including through the development of technical assistance guides, for the development and implementation of regional innovation strategies (including regional innovation clusters);

“(C) support the development of relevant metrics and measurement standards to evaluate regional innovation strategies (including regional innovation clusters), including the extent to which such strategies stimulate innovation, productivity, and economic development; and

“(D) collect and make available data on regional innovation cluster activity in the United States, including data on—

“(i) the size, specialization, and competitiveness of regional innovation clusters;

“(ii) the regional domestic product contribution, total jobs and earnings by key occupations, establishment size, nature of specialization, patents, Federal research and development spending, and other relevant information for regional innovation clusters; and

“(iii) supply chain product and service flows within and between regional innovation clusters.

“(2) RESEARCH GRANTS.—The Secretary may award research grants on a competitive basis to support and further the goals of the program established under this subsection.

“(3) DISSEMINATION OF INFORMATION.—Data and analysis compiled by the Secretary under the program established in this subsection shall be made available to other Federal agencies, State and local governments, and nonprofit and for-profit entities.

“(4) CLUSTER GRANT PROGRAM.—The Secretary shall incorporate data and analysis relating to any regional innovation cluster supported by a grant under subsection (b) into the program established under this subsection.

“(d) INTERAGENCY COORDINATION.—

“(1) IN GENERAL.—To the maximum extent practicable, the Secretary shall ensure that the activities carried out under this section are coordinated with, and do not duplicate the efforts of, other programs at the Department of Commerce or other Federal agencies.

“(2) COLLABORATION.—The Secretary shall explore and pursue collaboration with other Federal agencies, including through multiagency funding opportunities, on regional innovation strategies.

- “(e) EVALUATION.—
- “(1) IN GENERAL.—Not later than 4 years after the date of enactment of this section, the Secretary shall enter into a contract with an independent entity, such as the National Academy of Sciences, to conduct an evaluation of the program established under subsection (a).
- “(2) REQUIREMENTS.—The evaluation shall include—
- “(A) whether such program is achieving its goals;
- “(B) any recommendations for how such program may be improved; and
- “(C) a recommendation as to whether such program should be continued or terminated.
- “(f) REGIONAL INNOVATION CLUSTER DEFINED.—The term ‘regional innovation cluster’ means a geographically bounded network of similar, synergistic, or complementary entities that—
- “(1) are engaged in or with a particular industry sector;
- “(2) have active channels for business transactions and communication;
- “(3) share specialized infrastructure, labor markets, and services; and
- “(4) leverage the region’s unique competitive strengths to stimulate innovation and create jobs.
- “(g) AUTHORIZATION OF APPROPRIATIONS.—There are authorized to be appropriated such sums as are necessary for each of fiscal years 2011 through 2015 to carry out this section, including such sums as are necessary to carry out the evaluation required under subsection (e).”.

TITLE VI—DEPARTMENT OF ENERGY

Subtitle A—Office of Science

SEC. 601. SHORT TITLE.

This subtitle may be cited as the “Department of Energy Office of Science Authorization Act of 2010”.

SEC. 602. DEFINITIONS.

Except as otherwise provided, in this subtitle:

- (1) DEPARTMENT.—The term “Department” means the Department of Energy.
- (2) DIRECTOR.—The term “Director” means the Director of the Office of Science.
- (3) OFFICE OF SCIENCE.—The term “Office of Science” means the Department of Energy Office of Science.
- (4) SECRETARY.—The term “Secretary” means the Secretary of Energy.

SEC. 603. MISSION OF THE OFFICE OF SCIENCE.

(a) MISSION.—The mission of the Office of Science shall be the delivery of scientific discoveries, capabilities, and major scientific tools to transform the understanding of nature and to advance the energy, economic, and national security of the United States.

(b) DUTIES.—In support of this mission, the Secretary shall carry out, through the Office of Science, programs on basic energy sciences, biological and environmental research, advanced scientific computing research, fusion energy sciences, high energy physics, and nuclear physics through activities focused on—

- (1) Science for Discovery to unravel nature’s mysteries through the study of subatomic particles, atoms, and molecules that make up the materials of our everyday world to DNA, proteins, cells, and entire biological systems;
- (2) Science for National Need by—
- (A) advancing a clean energy agenda through research on energy production, storage, transmission, efficiency, and use; and
- (B) advancing our understanding of the Earth’s climate through research in atmospheric and environmental sciences and climate change; and

(3) National Scientific User Facilities to deliver the 21st century tools of science, engineering, and technology and provide the Nation’s researchers with the most advanced tools of modern science including accelerators, colliders, supercomputers, light sources and neutron sources, and facilities for studying the nanoworld.

(c) SUPPORTING ACTIVITIES.—The activities described in subsection (b) shall include providing for relevant facilities and infrastructure, analysis, coordination, and education and outreach activities.

(d) USER FACILITIES.—The Director shall carry out the construction, operation, and maintenance of user facilities to support the activities described in subsection (b). As practicable, these facilities shall serve the needs of the Department, industry,

the academic community, and other relevant entities for the purposes of advancing the missions of the Department.

(e) OTHER AUTHORIZED ACTIVITIES.—In addition to the activities authorized under this subtitle, the Office of Science shall carry out such other activities it is authorized or required to carry out by law.

(f) COORDINATION AND JOINT ACTIVITIES.—The Department's Under Secretary for Science shall ensure the coordination of activities under this subtitle with the other activities of the Department, and shall support joint activities among the programs of the Department.

(g) DOMESTICALLY SOURCED HARDWARE.—

(1) PLAN.—The Director shall develop a plan to increase the percentage of domestically sourced hardware for planned and ongoing projects of the Department of Energy. In developing this plan, the Director shall—

(A) give consideration to technologies that the United States does not currently have the capacity to manufacture and to procurement activities that can strengthen United States high-technology competitiveness broadly;

(B) seek opportunities to engage and partner with domestic manufacturers; and

(C) annually assess levels of domestically available goods relevant to planned and ongoing projects of the Office of Science.

(2) INTERNATIONAL AGREEMENTS.—This subsection shall be applied in a manner consistent with United States obligations under international agreements.

(3) REPORT TO CONGRESS.—Not later than 1 year after the date of enactment of this Act, the Director shall transmit the plan developed under this subsection to the Committee on Energy and Natural Resources of the Senate and the Committee on Science and Technology of the House of Representatives, and shall transmit any appropriate updates to those committees.

(h) MERIT-REVIEWED STUDY.—As part of the President's annual budget request, the Secretary shall include a detailed summary of the degree to which current research activities are competitive and merit-reviewed, including a list of activities that would have been undertaken in the absence of Congressionally-directed projects and an analysis of the effects of increasing the proportion of competitive, merit-reviewed activities on the strategic objectives of the Office of Science.

SEC. 604. BASIC ENERGY SCIENCES PROGRAM.

(a) PROGRAM.—As part of the activities authorized under section 603, the Director shall carry out a program in basic energy sciences, including materials sciences and engineering, chemical sciences, physical biosciences, and geosciences, for the purpose of providing the scientific foundations for new energy technologies.

(b) BASIC ENERGY SCIENCES USER FACILITIES.—

(1) IN GENERAL.—The Director shall carry out a program for the construction, operation, and maintenance of national user facilities to support the program under this section. As practicable, these facilities shall serve the needs of the Department, industry, the academic community, and other relevant entities to create and examine new materials and chemical processes for the purposes of advancing new energy technologies and improving the competitiveness of the United States. These facilities shall include—

(A) x-ray light sources;

(B) neutron sources;

(C) electron beam microcharacterization centers;

(D) nanoscale science research centers; and

(E) other facilities the Director considers appropriate, consistent with section 603(d).

(2) FACILITY CONSTRUCTION AND UPGRADES.—Consistent with the Office of Science's project management practices, the Director shall support construction of—

(A) the National Synchrotron Light Source II;

(B) a Second Target Station at the Spallation Neutron Source; and

(C) an upgrade of the Advanced Photon Source to improve brightness and performance.

(c) ENERGY FRONTIER RESEARCH CENTERS.—

(1) IN GENERAL.—The Director shall carry out a grant program to provide awards, on a competitive, merit-reviewed basis, to multi-institutional collaborations or other appropriate entities to conduct fundamental and use-inspired energy research to accelerate scientific breakthroughs related to needs identified in—

(A) the Grand Challenges report of the Department's Basic Energy Sciences Advisory Committee;

(B) the Basic Energy Sciences Basic Research Needs workshop reports;

- (C) energy-related Grand Challenges for Engineering, as described by the National Academy of Engineering; or
- (D) other relevant reports identified by the Director.
- (2) COLLABORATIONS.—A collaboration receiving a grant under this subsection may include multiple types of institutions and private sector entities.
- (3) SELECTION AND DURATION.—
 - (A) IN GENERAL.—A collaboration under this subsection shall be selected for a period of 5 years.
 - (B) REAPPLICATION.—After the end of the period described in subparagraph (A), a grantee may reapply for selection for a second period of 5 years on a competitive, merit-reviewed basis.
 - (4) NO FUNDING FOR CONSTRUCTION.—No funding provided pursuant to this subsection may be used for the construction of new buildings or facilities.
 - (d) ACCELERATOR RESEARCH AND DEVELOPMENT.—The Director shall carry out research and development on advanced accelerator technologies relevant to the development of Basic Energy Sciences user facilities, in consultation with the Office of Science’s High Energy Physics and Nuclear Physics programs.

SEC. 605. BIOLOGICAL AND ENVIRONMENTAL RESEARCH PROGRAM.

- (a) IN GENERAL.—As part of the activities authorized under section 603, and coordinated with the activities authorized in section 604, the Director shall carry out a program of research, development, and demonstration in the areas of biological systems science and climate and environmental science to support the energy and environmental missions of the Department.
- (b) BIOLOGICAL SYSTEMS SCIENCE ACTIVITIES.—
 - (1) ACTIVITIES.—As part of the activities authorized under subsection (a), the Director shall carry out research, development, and demonstration activities in fundamental, structural, computational, and systems biology to increase systems-level understanding of complex biological systems, which shall include activities to—
 - (A) accelerate breakthroughs and new knowledge that will enable cost-effective sustainable production of—
 - (i) biomass-based liquid transportation fuels, including hydrogen;
 - (ii) bioenergy; and
 - (iii) biobased products,
 - that support the energy and environmental missions of the Department;
 - (B) improve understanding of the global carbon cycle, including processes for removing carbon dioxide from the atmosphere, through photosynthesis and other biological processes, for sequestration and storage; and
 - (C) understand the biological mechanisms used to destroy, immobilize, or remove contaminants from subsurface environments.
 - (2) RESEARCH PLAN.—
 - (A) REQUIREMENT.—Not later than 1 year after the date of enactment of this Act, the Director shall prepare and transmit to Congress a research plan describing how the activities authorized under this subsection will be undertaken.
 - (B) UTILIZATION OF EXISTING PLAN.—In developing the plan in subparagraph (A), the Director may utilize an existing research plan and update such plan to incorporate the activities identified in paragraph (1).
 - (C) UPDATES.—Not later than 3 years after the initial report under this paragraph, and at least once every 3 years thereafter, the Director shall update the research plan and transmit it to Congress.
 - (3) BIOENERGY RESEARCH CENTERS.—
 - (A) IN GENERAL.—In carrying out the activities under paragraph (1), the Director shall support at least 3 bioenergy research centers to accelerate basic biological research, development, demonstration, and commercial application of biomass-based liquid transportation fuels, bioenergy, and biobased products that support the energy and environmental missions of the Department and are produced from a variety of regionally diverse feedstocks.
 - (B) GEOGRAPHIC DISTRIBUTION.—The Director shall ensure that the bioenergy research centers under this paragraph are established in geographically diverse locations.
 - (C) SELECTION AND DURATION.—A center established under subparagraph (A) shall be selected on a competitive, merit-reviewed basis for a period of 5 years beginning on the date of establishment of that center. A center already in existence on the date of enactment of this Act may continue to receive support for a period of 5 years beginning on the date of establishment of that center.

(4) ENABLING SYNTHETIC BIOLOGY PLAN.—

(A) IN GENERAL.—The Secretary, in consultation with other relevant Federal agencies, the academic community, research-based nonprofit entities, and the private sector, shall develop a comprehensive plan for federally supported research and development activities that will support the energy and environmental missions of the Department and enable a competitive synthetic biology industry in the United States.

(B) PLAN.—The plan developed under subparagraph (A) shall assess the need to create a database for synthetic biology information, the need and process for developing standards for biological parts, components and systems, and the need for a federally funded facility that enables the discovery, design, development, production, and systematic use of parts, components, and systems created through synthetic biology. The plan shall describe the role of the Federal Government in meeting these needs.

(C) SUBMISSION TO CONGRESS.—The Secretary shall transmit the plan developed under subparagraph (A) to the Congress not later than 9 months after the date of enactment of this Act.

(5) COMPUTATIONAL BIOLOGY AND SYSTEMS BIOLOGY KNOWLEDGEBASE.—As part of the activities described in paragraph (1), the Director, in collaboration with the Advanced Scientific Computing Research program described in section 606, shall carry out research in computational biology, acquire or otherwise ensure the availability of hardware for biology-specific computation, and establish and maintain an open virtual database and information management system to centrally integrate systems biology data, analytical software, and computational modeling tools that will allow data sharing and free information exchange within the scientific community.

(6) PROHIBITION ON BIOMEDICAL AND HUMAN CELL AND HUMAN SUBJECT RESEARCH.—

(A) NO BIOMEDICAL RESEARCH.—In carrying out activities under subsection (b), the Secretary shall not conduct biomedical research.

(B) LIMITATIONS.—Nothing in subsection (b) shall authorize the Secretary to conduct any research or demonstrations—

- (i) on human cells or human subjects; or
- (ii) designed to have direct application with respect to human cells or human subjects.

(C) INFORMATION SHARING.—Nothing in this paragraph shall restrict the Department from sharing information, including research findings, research methodologies, models, or any other information, with any Federal agency.

(7) REPEAL.—Section 977 of the Energy Policy Act of 2005 (42 U.S.C. 16317) is repealed.

(c) CLIMATE AND ENVIRONMENTAL SCIENCES ACTIVITIES.—

(1) IN GENERAL.—As part of the activities authorized under subsection (a), the Director shall carry out climate and environmental science research, which shall include activities to—

(A) understand, observe, and model the response of the Earth's atmosphere and biosphere, including oceans, to increased concentrations of greenhouse gas emissions, and any associated changes in climate;

(B) understand the processes for sequestration, destruction, immobilization, or removal of, and understand the movement of, contaminants and carbon in subsurface environments, including at facilities of the Department; and

(C) inform potential mitigation and adaptation options for increased concentrations of greenhouse gas emissions and any associated changes in climate.

(2) SUBSURFACE BIOGEOCHEMISTRY RESEARCH.—

(A) IN GENERAL.—As part of the activities described in paragraph (1), the Director shall carry out research to advance a fundamental understanding of coupled physical, chemical, and biological processes for controlling the movement of sequestered carbon and subsurface environmental contaminants, including field observations of subsurface microorganisms and field-scale subsurface research.

(B) COORDINATION.—

(i) DIRECTOR.—The Director shall carry out activities under this paragraph in accordance with priorities established by the Department's Under Secretary for Science to support and accelerate the decontamination of relevant facilities managed by the Department.

(ii) UNDER SECRETARY FOR SCIENCE.—The Department's Under Secretary for Science shall ensure the coordination of the activities of the Department, including activities under this paragraph, to support and

accelerate the decontamination of relevant facilities managed by the Department.

(3) NEXT-GENERATION ECOSYSTEM-CLIMATE EXPERIMENT.—

(A) IN GENERAL.—As part of the activities described in paragraph (1), the Director, in collaboration with other relevant agencies that are participants in the United States Global Change Research Program, shall carry out the selection and development of a next-generation ecosystem-climate change experiment to understand the impact and feedbacks of increased temperature and elevated carbon levels on ecosystems.

(B) REPORT.—Not later than 1 year after the date of enactment of this Act, the Director shall transmit to the Congress a report containing—

- (i) an identification of the location or locations that have been selected for the experiment described in subparagraph (A);
- (ii) a description of the need for additional experiments; and
- (iii) an associated research plan.

(4) AMERIFLUX NETWORK COORDINATION AND RESEARCH.—As part of the activities described in paragraph (1), the Director shall carry out research and coordinate the AmeriFlux Network to directly observe and understand the exchange of greenhouse gases, water vapor, and heat energy within terrestrial ecosystems and the response of those systems to climate change and other dynamic terrestrial landscape changes. The Director, in collaboration with other relevant Federal agencies, shall—

(A) identify opportunities to incorporate innovative and emerging observation technologies and practices into the existing Network;

(B) conduct research to determine the need for increased greenhouse gas observation Network facilities across North America to meet future mitigation and adaptation needs of the United States; and

(C) examine how the technologies and practices described in subparagraph (A), and increased coordination among scientific communities through the Network, have the potential to help characterize terrestrial baseline greenhouse gas emission sources and sinks in the United States and internationally.

(5) CLIMATE AND EARTH MODELING.—As part of the activities described in paragraph (1), the Director, in collaboration with the Advanced Scientific Computing Research program described in section 606, shall carry out research to develop, evaluate, and use high-resolution regional climate, global climate, Earth, and predictive models to inform decisions on reducing the impacts of changing climate.

(6) INTEGRATED ASSESSMENT RESEARCH.—As part of the activities described in paragraph (1), the Director shall carry out research into options for mitigation of and adaptation to climate change through multiscale models of the entire climate system. Such modeling shall include human processes and greenhouse gas emissions, land use, and interaction among human and Earth systems.

(7) COORDINATION.—The Director shall coordinate activities under this subsection with other Office of Science activities and with the United States Global Change Research Program.

(d) USER FACILITIES AND ANCILLARY EQUIPMENT.—

(1) IN GENERAL.—The Director shall carry out a program for the construction, operation, and maintenance of user facilities to support the program under this section. As practicable, these facilities shall serve the needs of the Department, industry, the academic community, and other relevant entities.

(2) INCLUDED FUNCTIONS.—User facilities described in paragraph (1) shall include facilities which carry out—

(A) genome sequencing and analysis of plants, microbes, and microbial communities using high throughput tools, technologies, and comparative analysis;

(B) molecular level research in biological, chemical, environmental, and subsurface sciences, including synthesis, dynamic properties, and interactions among natural and engineered materials; and

(C) measurement of cloud and aerosol properties used for examining atmospheric processes and evaluating climate model performance, including ground stations at various locations, mobile resources, and aerial vehicles.

SEC. 606. ADVANCED SCIENTIFIC COMPUTING RESEARCH PROGRAM.

(a) IN GENERAL.—As part of the activities authorized under section 603, the Director shall carry out a research, development, demonstration, and commercial application program to advance computational and networking capabilities to analyze, model, simulate, and predict complex phenomena relevant to the development of new energy technologies and the competitiveness of the United States.

(b) COORDINATION.—

(1) DIRECTOR.—The Director shall carry out activities under this section in accordance with priorities established by the Department's Under Secretary for Science to determine and meet the computational and networking research and facility needs of the Office of Science and all other relevant energy technology and energy efficiency programs within the Department.

(2) UNDER SECRETARY FOR SCIENCE.—The Department's Under Secretary for Science shall ensure the coordination of the activities of the Department, including activities under this section, to determine and meet the computational and networking research and facility needs of the Office of Science and all other relevant energy technology and energy efficiency programs within the Department.

(c) RESEARCH TO SUPPORT ENERGY APPLICATIONS.—As part of the activities authorized under subsection (a), the program shall support research in high-performance computing and networking relevant to energy applications, including both basic and applied energy research programs carried out by the Secretary.

(d) REPORTS.—

(1) ADVANCED COMPUTING FOR ENERGY APPLICATIONS.—Not later than one year after the date of enactment of this Act, the Secretary shall transmit to the Congress a plan to integrate and leverage the expertise and capabilities of the program described in subsection (a), as well as other relevant computational and networking research programs and resources supported by the Federal Government, to advance the missions of the Department's applied energy and energy efficiency programs.

(2) EXASCALE COMPUTING.—At least 18 months prior to the initiation of construction or installation of any exascale-class computing facility, the Secretary shall transmit a plan to the Congress detailing—

(A) the proposed facility's cost projections and capabilities to significantly accelerate the development of new energy technologies;

(B) technical risks and challenges that must be overcome to achieve successful completion and operation of the facility; and

(C) an assessment of the scientific and technological advances expected from such a facility relative to those expected from a comparable investment in expanded research and applications at terascale-class and petascale-class computing facilities.

(e) APPLIED MATHEMATICS AND SOFTWARE DEVELOPMENT FOR HIGH-END COMPUTING SYSTEMS.—The Director shall carry out activities to develop, test, and support mathematics, models, and algorithms for complex systems, as well as programming environments, tools, languages, and operating systems for high-end computing systems (as defined in section 2 of the Department of Energy High-End Computing Revitalization Act of 2004 (15 U.S.C. 5541)).

(f) HIGH-END COMPUTING FACILITIES.—The Director shall—

(1) provide for sustained access by the public and private research community in the United States to high-end computing systems, including access to the National Energy Research Scientific Computing Center and to Leadership Systems (as defined in section 2 of the Department of Energy High-End Computing Revitalization Act of 2004 (15 U.S.C. 5541));

(2) provide technical support for users of such systems; and

(3) conduct research and development on next-generation computing architectures and platforms to support the missions of the Department.

(g) OUTREACH.—The Secretary shall conduct outreach programs and may form partnerships to increase the use of and access to high-performance computing modeling and simulation capabilities by industry, including manufacturers.

SEC. 607. FUSION ENERGY RESEARCH PROGRAM.

(a) PROGRAM.—As part of the activities authorized under section 603, the Director shall carry out a fusion energy sciences research and enabling technology development program to effectively address the scientific and engineering challenges to building a cost-competitive fusion power plant and a competitive fusion power industry in the United States. As part of this program, the Director shall carry out research activities to expand the fundamental understanding of plasmas and matter at very high temperatures and densities.

(b) ITER.—The Director shall coordinate and carry out the responsibilities of the United States with respect to the ITER international fusion project pursuant to the Agreement on the Establishment of the ITER International Fusion Energy Organization for the Joint Implementation of the ITER Project.

(c) IDENTIFICATION OF PRIORITIES.—Not later than 18 months after the date of enactment of this Act, the Secretary shall transmit to the Congress a report on the Department's proposed research and development activities in magnetic fusion over

the 10 years following the date of enactment of this Act under four realistic budget scenarios. The report shall—

- (1) identify specific areas of fusion energy research and enabling technology development in which the United States can and should establish or solidify a lead in the global fusion energy development effort; and
- (2) identify priorities for initiation of facility construction and facility decommissioning under each of those scenarios.

(d) **FUSION MATERIALS RESEARCH AND DEVELOPMENT.**—The Director, in coordination with the Assistant Secretary for Nuclear Energy of the Department, shall carry out research and development activities to identify, characterize, and create materials that can endure the neutron, plasma, and heat fluxes expected in a commercial fusion power plant. As part of the activities authorized under subsection (c), the Secretary shall—

- (1) provide an assessment of the need for a facility or facilities that can examine and test potential fusion and next generation fission materials and other enabling technologies relevant to the development of commercial fusion power plants; and
- (2) provide an assessment of whether a single new facility that substantially addresses magnetic fusion, inertial fusion, and next generation fission materials research needs is feasible, in conjunction with the expected capabilities of facilities operational as of the date of enactment of this Act.

(e) **ENABLING TECHNOLOGY DEVELOPMENT.**—The Director shall carry out activities to develop technologies necessary to enable the reliable, sustainable, safe, and economically competitive operation of a commercial fusion power plant.

(f) **FUSION SIMULATION PROJECT.**—In collaboration with the Office of Science’s Advanced Scientific Computing Research program described in section 606, the Director shall carry out a computational project to advance the capability of fusion researchers to accurately simulate an entire fusion energy system.

(g) **INERTIAL FUSION ENERGY RESEARCH AND DEVELOPMENT PROGRAM.**—The Secretary shall carry out a program of research and technology development in inertial fusion for energy applications, including ion beam and laser fusion. Not later than 180 days after the release of a report from the National Academies on inertial fusion energy research, the Secretary shall transmit to Congress a report describing the Department’s plan to incorporate any relevant recommendations from the National Academies’ report into this program.

SEC. 608. HIGH ENERGY PHYSICS PROGRAM.

(a) **PROGRAM.**—As part of the activities authorized under section 603, the Director shall carry out a research program on the elementary constituents of matter and energy and the nature of space and time.

(b) **NEUTRINO RESEARCH.**—As part of the program described in subsection (a), the Director shall carry out research activities on rare decay processes and the nature of the neutrino, which may—

- (1) include collaborations with the National Science Foundation on relevant projects; and
- (2) utilize components of existing accelerator facilities to produce neutrino beams of sufficient intensity to explore research priorities identified by the High Energy Physics Advisory Panel or the National Academy of Sciences.

(c) **DARK ENERGY AND DARK MATTER RESEARCH.**—As part of the program described in subsection (a), the Director shall carry out research activities on the nature of dark energy and dark matter. These activities shall be consistent with research priorities identified by the High Energy Physics Advisory Panel or the National Academy of Sciences, and may include—

- (1) the development of space-based and land-based facilities and experiments; and
- (2) collaborations with the National Aeronautics and Space Administration, the National Science Foundation, or international collaborations on relevant research projects.

(d) **ACCELERATOR RESEARCH AND DEVELOPMENT.**—The Director shall carry out research and development in advanced accelerator concepts and technologies to reduce the necessary scope and cost for the next generation of particle accelerators.

(e) **INTERNATIONAL COLLABORATION.**—The Director, as practicable and in coordination with other appropriate Federal agencies as necessary, shall ensure the access of United States researchers to the most advanced accelerator facilities and research capabilities in the world, including the Large Hadron Collider.

SEC. 609. NUCLEAR PHYSICS PROGRAM.

(a) **PROGRAM.**—As part of the activities authorized under section 603, the Director shall carry out a research program, and support relevant facilities, to discover and understand various forms of nuclear matter.

(b) **FACILITY CONSTRUCTION AND UPGRADES.**—Consistent with the Office of Science’s project management practices, the Director shall carry out—

- (1) an upgrade of the Continuous Electron Beam Accelerator Facility to a 12 gigaelectronvolt beam of electrons; and
- (2) construction of the Facility for Rare Isotope Beams.

(c) **ISOTOPE DEVELOPMENT AND PRODUCTION FOR RESEARCH APPLICATIONS.**—The Director shall carry out a program for the production of isotopes, including the development of techniques to produce isotopes, that the Secretary determines are needed for research or other purposes. In making this determination, the Secretary shall consider any relevant recommendations made by Federal advisory committees, the National Academies, and interagency working groups in which the Department participates.

SEC. 610. SCIENCE LABORATORIES INFRASTRUCTURE PROGRAM.

(a) **PROGRAM.**—The Director shall carry out a program to improve the safety, efficiency, and mission readiness of infrastructure at Office of Science laboratories. The program shall include projects to—

- (1) renovate or replace space that does not meet research needs;
- (2) replace facilities that are no longer cost effective to renovate or operate;
- (3) modernize utility systems to prevent failures and ensure efficiency;
- (4) remove excess facilities to allow safe and efficient operations; and
- (5) construct modern facilities to conduct advanced research in controlled environmental conditions.

(b) **MINOR CONSTRUCTION PROJECTS.**—

(1) **AUTHORITY.**—Using operation and maintenance funds or facilities and infrastructure funds authorized by law, the Secretary may carry out minor construction projects with respect to laboratories administered by the Office of Science.

(2) **ANNUAL REPORT.**—The Secretary shall submit to Congress, as part of the annual budget submission of the Department, a report on each exercise of the authority under subsection (a) during the preceding fiscal year. Each report shall include a summary of maintenance and infrastructure needs and associated funding requirements at each of the laboratories, including the amount of both planned and deferred infrastructure spending at each laboratory. Each report shall provide a brief description of each minor construction project covered by the report.

(3) **COST VARIATION REPORTS.**—If, at any time during the construction of any minor construction project, the estimated cost of the project is revised and the revised cost of the project exceeds the minor construction threshold, the Secretary shall immediately submit to Congress a report explaining the reasons for the cost variation.

(4) **DEFINITIONS.**—In this section—

(A) the term “minor construction project” means any plant project not specifically authorized by law for which the approved total estimated cost does not exceed the minor construction threshold; and

(B) the term “minor construction threshold” means \$10,000,000, with such amount to be adjusted by the Secretary in accordance with the Engineering News-Record Construction Cost Index, or an appropriate alternative index as determined by the Secretary, once every five years after the date of enactment of this Act.

(5) **NONAPPLICABILITY.**—Sections 4703 and 4704 of the Atomic Energy Defense Act (50 U.S.C. 2743 and 2744) shall not apply to laboratories administered by the Office of Science.

SEC. 611. AUTHORIZATION OF APPROPRIATIONS.

There are authorized to be appropriated to the Secretary for the activities of the Office of Science—

- (1) \$5,247,000,000 for fiscal year 2011, of which—
 - (A) \$1,875,000,000 shall be for Basic Energy Sciences activities under section 604;
 - (B) \$667,000,000 shall be for Biological and Environmental Research activities under section 605; and
 - (C) \$466,000,000 shall be for Advanced Scientific Computing Research activities under section 606;
- (2) \$5,614,000,000 for fiscal year 2012, of which—
 - (A) \$2,025,000,000 shall be for Basic Energy Sciences activities under section 604;
 - (B) \$720,000,000 shall be for Biological and Environmental Research activities under section 605; and

- (C) \$503,000,000 shall be for Advanced Scientific Computing Research activities under section 606;
- (3) \$6,007,000,000 for fiscal year 2013, of which—
 - (A) \$2,187,000,000 shall be for Basic Energy Sciences activities under section 604;
 - (B) \$778,000,000 shall be for Biological and Environmental Research activities under section 605; and
 - (C) \$544,000,000 shall be for Advanced Scientific Computing Research activities under section 606;
- (4) \$6,428,000,000 for fiscal year 2014, of which—
 - (A) \$2,362,000,000 shall be for Basic Energy Sciences activities under section 604;
 - (B) \$840,000,000 shall be for Biological and Environmental Research activities under section 605; and
 - (C) \$587,000,000 shall be for Advanced Scientific Computing Research activities under section 606; and
- (5) \$6,878,000,000 for fiscal year 2015, of which—
 - (A) \$2,551,000,000 shall be for Basic Energy Sciences activities under section 604;
 - (B) \$907,000,000 shall be for Biological and Environmental Research activities under section 605; and
 - (C) \$634,000,000 shall be for Advanced Scientific Computing Research activities under section 606.

Subtitle B—Advanced Research Projects Agency-Energy

SEC. 621. SHORT TITLE.

This subtitle may be cited as the “ARPA-E Reauthorization Act of 2010”.

SEC. 622. ARPA-E AMENDMENTS.

Section 5012 of the America COMPETES Act (42 U.S.C. 16538) is amended—

- (1) in subsection (c)(2)—
 - (A) in subparagraph (A), by inserting “and applied” after “advances in fundamental”;
 - (B) by striking “and” at the end of subparagraph (B);
 - (C) by striking the period at the end of subparagraph (C) and inserting “, and”; and
 - (D) by adding at the end the following new subparagraph:
 - “(D) promoting the commercial application of advanced energy technologies.”;
- (2) in subsection (e)(3), by amending subparagraph (C) to read as follows:
 - “(C) research and development of advanced manufacturing process and technologies for the domestic manufacturing of novel energy technologies; and”;
- (3) in subsection (e)—
 - (A) by striking “and” at the end of paragraph (3)(D);
 - (B) by striking the period at the end of paragraph (4) and inserting “, and”; and
 - (C) by adding at the end the following new paragraph:
 - “(5) pursuant to subsection (c)(2)(C)—
 - “(A) ensuring that applications for funding disclose the extent of current and prior efforts, including monetary investments as appropriate, in pursuit of the technology area for which funding is being requested;
 - “(B) adopting measures to ensure that, in making awards, program managers adhere to the objectives in subsection (c)(2)(C); and
 - “(C) providing as part of the annual report required by subsection (h)(1) a summary of the instances of and reasons for ARPA-E funding projects in technology areas already being undertaken by industry.”;
- (4) by redesignating subsections (f) through (m) as subsections (g), (h), (i), (j), (l), (m), (n), and (o), respectively;
- (5) by inserting after subsection (e) the following new subsection:
 - “(f) AWARDS.—In carrying out this section, the Director shall initiate and execute awards in the form of grants, contracts, cooperative agreements, cash prizes, and other transactions.”;
- (6) in subsection (g), as so redesignated by paragraph (4) of this section—

(A) by redesignating paragraphs (1) and (2) as paragraphs (2) and (3), respectively;

(B) by inserting before paragraph (2), as so redesignated by subparagraph (A) of this paragraph, the following new paragraph:

“(1) IN GENERAL.—The Director shall establish and maintain within ARPA-E a staff with sufficient qualifications and expertise to enable ARPA-E to carry out its responsibilities under this section in conjunction with the operations of the rest of the Department.”;

(C) in paragraph (2)(A), as so redesignated by subparagraph (A) of this paragraph—

(i) in the paragraph heading, by striking “PROGRAM MANAGERS” and inserting “PROGRAM DIRECTORS”;

(ii) by striking “program managers” and inserting “program directors”; and

(iii) by striking “each of”.

(D) in paragraph (2)(B), as so redesignated by subparagraph (A) of this paragraph—

(i) by striking “program manager” and inserting “program director”;

(ii) in clause (iv), by striking “, with advice under subsection (j) as appropriate.”;

(iii) by redesignating clauses (v) and (vi) as clauses (vi) and (viii), respectively;

(iv) by inserting after clause (iv) the following new clause:

“(v) identifying innovative cost-sharing arrangements for ARPA-E projects, including through use of the authority under section 988(b)(3) of the Energy Policy Act of 2005 (42 U.S.C. 16352(b)(3));”;

(v) in clause (vi), as so redesignated by clause (iii) of this subparagraph, by striking “; and” and inserting a semicolon; and

(vi) by inserting after clause (vi), as so redesignated by clause (iii) of this subparagraph, the following new clause:

“(vii) identifying mechanisms for commercial application of successful energy technology development projects, including through establishment of partnerships between awardees and commercial entities; and”;

(E) in paragraph (2)(C), as so redesignated by subparagraph (A) of this paragraph, by inserting “up to” after “shall be”;

(F) in paragraph (3), as so redesignated by subparagraph (A) of this paragraph, by striking subparagraph (B) and redesignating subparagraphs (C) and (D) as subparagraphs (B) and (C), respectively; and

(G) by adding at the end the following new paragraph:

“(4) FELLOWSHIPS.—The Director is authorized to select exceptional early-career and senior scientific, legal, business, and technical personnel to serve as fellows to work at ARPA-E for terms not to exceed two years. Responsibilities of fellows may include—

“(A) supporting program managers in program creation, design, implementation, and management;

“(B) exploring technical fields for future ARPA-E program areas;

“(C) assisting the Director in the creation of the strategic vision for ARPA-E referred to in subsection (h)(2);

“(D) preparing energy technology and economic analyses; and

“(E) any other appropriate responsibilities identified by the Director.”;

(7) in subsection (h)(2), as so redesignated by paragraph (4) of this section—

(A) by striking “2008” and inserting “2010”; and

(B) by striking “2011” and inserting “2013”;

(8) by amending subsection (j), as so redesignated by paragraph (4) of this section, to read as follows:

“(j) FEDERAL DEMONSTRATION OF TECHNOLOGIES.—The Director shall seek opportunities to partner with purchasing and procurement programs of Federal agencies to demonstrate energy technologies resulting from activities funded through ARPA-E.”;

(9) by inserting after such subsection (j) the following new subsection:

“(k) EVENTS.—

“(1) The Director is authorized to convene, organize, and sponsor events that further the objectives of ARPA-E, including events that assemble awardees, the most promising applicants for ARPA-E funding, and a broad range of ARPA-E stakeholders (which may include members of relevant scientific research and academic communities, government officials, financial institutions, private investors, entrepreneurs, and other private entities), for the purposes of—

“(A) demonstrating projects of ARPA-E awardees;

“(B) demonstrating projects of finalists for ARPA-E awards and other energy technology projects;

“(C) facilitating discussion of the commercial application of energy technologies developed under ARPA-E and other government-sponsored research and development programs; or

“(D) such other purposes as the Director considers appropriate.

“(2) Funding for activities described in paragraph (1) shall be provided as part of the technology transfer and outreach activities authorized under subsection (o)(4)(B).”;

(10) in subsection (m)(1), as so redesignated by paragraph (4) of this section, by striking “4 years” and inserting “6 years”;

(11) in subsection (m)(2)(B), as so redesignated by paragraph (4) of this section, by inserting “, and how those lessons may apply to the operation of other programs within the Department of Energy” after “ARPA-E”;

(12) by amending subsection (o)(2), as so redesignated by paragraph (4) of this section, to read as follows:

“(2) AUTHORIZATION OF APPROPRIATIONS.—Subject to paragraph (4), there are authorized to be appropriated to the Director for deposit in the Fund, without fiscal year limitation—

“(A) \$300,000,000 for fiscal year 2011;

“(B) \$450,000,000 for fiscal year 2012;

“(C) \$600,000,000 for fiscal year 2013;

“(D) \$800,000,000 for fiscal year 2014; and

“(E) \$1,000,000,000 for fiscal year 2015.”;

(13) in subsection (o), as so redesignated by paragraph (4) of this section, by—

(A) striking paragraph (4); and

(B) redesignating paragraph (5) as paragraph (4); and

(14) in subsection (o)(4)(B), as so redesignated by paragraphs (4) and (13)(B) of this subsection—

(A) by striking “2.5 percent” and inserting “5 percent”; and

(B) by inserting “, consistent with the goal described in subsection (c)(2)(D) and within the responsibilities of program directors as specified in subsection (g)(2)(B)(vii)” after “outreach activities”.

Subtitle C—Energy Innovation Hubs

SEC. 631. SHORT TITLE.

This subtitle may be cited as the “Energy Innovation Hubs Authorization Act of 2010”.

SEC. 632. ENERGY INNOVATION HUBS.

(a) ESTABLISHMENT OF PROGRAM.—

(1) IN GENERAL.—The Secretary of Energy shall carry out a program to enhance the Nation’s economic, environmental, and energy security by making grants to consortia for establishing and operating Energy Innovation Hubs to conduct and support, whenever practicable at one centralized location, multidisciplinary, collaborative research, development, demonstration, and commercial application of advanced energy technologies in areas not being served by the private sector.

(2) TECHNOLOGY DEVELOPMENT FOCUS.—The Secretary shall designate for each Hub a unique advanced energy technology development focus.

(3) COORDINATION.—The Secretary shall ensure the coordination of, and avoid unnecessary duplication of, the activities of Hubs with those of other Department of Energy research entities, including the National Laboratories, the Advanced Research Projects Agency—Energy, and Energy Frontier Research Centers, and within industry. Such coordination shall include convening and consulting with representatives of staff of the Department of Energy, representatives from Hubs and the qualifying entities that are members of the consortia operating the Hubs, and representatives of such other entities as the Secretary considers appropriate, to share research results, program plans, and opportunities for collaboration.

(4) ADMINISTRATION.—The Secretary shall administer this section with respect to each Hub through the Department program office appropriate to administer the subject matter of the technology development focus assigned under paragraph (2) for the Hub.

(b) CONSORTIA.—

(1) ELIGIBILITY.—To be eligible to receive a grant under this section for the establishment and operation of a Hub, a consortium shall—

- (A) be composed of no fewer than 2 qualifying entities;
- (B) operate subject to a binding agreement entered into by its members that documents—
 - (i) the proposed partnership agreement, including the governance and management structure of the Hub;
 - (ii) measures to enable cost-effective implementation of the program under this section;
 - (iii) a proposed budget, including financial contributions from non-Federal sources;
 - (iv) conflict of interest procedures consistent with subsection (d)(3), all known material conflicts of interest, and corresponding mitigation plans;
 - (v) an accounting structure that enables the Secretary to ensure that the consortium has complied with the requirements of this section; and
 - (vi) an external advisory committee consistent with subsection (d)(2); and
- (C) operate as a nonprofit organization.

(2) APPLICATION.—A consortium seeking to establish and operate a Hub under this section, acting through a prime applicant, shall transmit to the Secretary an application at such time, in such form, and accompanied by such information as the Secretary shall require, including a detailed description of the elements of the consortium agreement required under paragraph (1)(B). If the consortium members will not be located at one centralized location, such application shall include a communications plan that ensures close coordination and integration of the Hub's activities.

(c) SELECTION AND SCHEDULE.—The Secretary shall select consortia for grants for the establishment and operation of Hubs through competitive selection processes. Grants made to a Hub shall be for a period not to exceed 5 years, after which the grant may be renewed, subject to a competitive selection process.

(d) HUB OPERATIONS.—

(1) IN GENERAL.—Hubs shall conduct or provide for multidisciplinary, collaborative research, development, demonstration, and commercial application of advanced energy technologies within the technology development focus designated for the Hub by the Secretary under subsection (a)(2). Each Hub shall—

(A) encourage collaboration and communication among the member qualifying entities of the consortium and awardees by conducting activities whenever practicable at one centralized location;

(B) develop and publish on the Department of Energy's website proposed plans and programs;

(C) submit an annual report to the Secretary summarizing the Hub's activities, including detailing organizational expenditures, listing external advisory committee members, and describing each project undertaken by the Hub; and

(D) monitor project implementation and coordination.

(2) EXTERNAL ADVISORY COMMITTEE.—Each Hub shall establish an external advisory committee, the membership of which shall have sufficient expertise to advise and provide guidance on scientific, technical, industry, financial, and research management matters.

(3) CONFLICTS OF INTEREST.—

(A) PROCEDURES.—Hubs shall establish conflict of interest procedures, consistent with those of the Department of Energy, to ensure that employees and consortia designees for Hub activities who are in decisionmaking capacities disclose all material conflicts of interest, including financial, organizational, and personal conflicts of interest.

(B) DISQUALIFICATION AND REVOCATION.—The Secretary may disqualify an application or revoke funds distributed to a Hub if the Secretary discovers a failure to comply with conflict of interest procedures established under subparagraph (A).

(e) PROHIBITION ON CONSTRUCTION.—

(1) IN GENERAL.—No funds provided pursuant to this section may be used for construction of new buildings or facilities for Hubs. Construction of new buildings or facilities shall not be considered as part of the non-Federal share of a Hub cost-sharing agreement.

(2) TEST BED AND RENOVATION EXCEPTION.—Nothing in this subsection shall prohibit the use of funds provided pursuant to this section, or non-Federal cost share funds, for the construction of a test bed or renovations to existing buildings or facilities for the purposes of research if the Oversight Board determines that the test bed or renovations are limited to a scope and scale necessary for the research to be conducted.

(f) OVERSIGHT BOARD.—The Secretary shall establish and maintain within the Department an Oversight Board to oversee the progress of Hubs.

(g) PRIORITY CONSIDERATION.—The Secretary shall give priority consideration to applications in which 1 or more of the institutions under subsection (b)(1)(A) are 1890 Land Grant Institutions (as defined in section 2 of the Agricultural Research, Extension, and Education Reform Act of 1998 (7 U.S.C. 7061)), Predominantly Black Institutions (as defined in section 318 of the Higher Education Act of 1965 (20 U.S.C. 1059e)), Tribal Colleges or Universities (as defined in section 316(b) of the Higher Education Act of 1965 (20 U.S.C. 1059c(b))), or Hispanic Serving Institutions (as defined in section 318 of the Higher Education Act of 1965 (20 U.S.C. 1059e)).

(h) DEFINITIONS.—For purposes of this section:

(1) ADVANCED ENERGY TECHNOLOGY.—The term “advanced energy technology” means an innovative technology—

(A) that produces energy from solar, wind, geothermal, biomass, tidal, wave, ocean, or other renewable energy resources;

(B) that produces nuclear energy;

(C) for carbon capture and sequestration;

(D) that enables advanced vehicles, vehicle components, and related technologies that result in significant energy savings;

(E) that generates, transmits, distributes, utilizes, or stores energy more efficiently than conventional technologies; or

(F) that enhances the energy independence and security of the United States by enabling improved or expanded supply and production of domestic energy resources, including coal, oil, and natural gas.

(2) HUB.—The term “Hub” means an Energy Innovation Hub established in accordance with this section.

(3) INSTITUTION OF HIGHER EDUCATION.—The term “institution of higher education” has the meaning given that term in section 101(a) of the Higher Education Act of 1965 (20 U.S.C. 1001(a)).

(4) QUALIFYING ENTITY.—The term “qualifying entity” means—

(A) an institution of higher education;

(B) an appropriate State or Federal entity, including the Department of Energy Federally Funded Research and Development Centers;

(C) a nongovernmental organization with expertise in advanced energy technology research, development, demonstration, or commercial application; or

(D) any other relevant entity the Secretary considers appropriate.

(5) SECRETARY.—The term “Secretary” means the Secretary of Energy.

(i) AUTHORIZATION OF APPROPRIATIONS.—There are authorized to be appropriated to the Secretary to carry out this section—

(1) \$110,000,000 for fiscal year 2011;

(2) \$135,000,000 for fiscal year 2012;

(3) \$195,000,000 for fiscal year 2013;

(4) \$210,000,000 for fiscal year 2014; and

(5) \$210,000,000 for fiscal year 2015.

Subtitle D—Cooperative Research and Development Fund

SEC. 641. SHORT TITLE.

This subtitle may be cited as the “Cooperative Research and Development Fund Authorization Act of 2010”.

SEC. 642. COOPERATIVE RESEARCH AND DEVELOPMENT FUND.

(a) IN GENERAL.—The Secretary of Energy shall make funds available to Department of Energy National Laboratories for the Federal share of cooperative research and development agreements. The Secretary of Energy shall determine the apportionment of such funds to each Department of Energy National Laboratory and shall ensure that special consideration is given to small business firms and consortia involving small business firms in the selection process for which cooperative research and development agreements will receive such funds.

(b) REPORTING.—Each year the Secretary shall submit to Congress a report that describes how funds were expended under this subtitle.

(c) AUTHORIZATION OF APPROPRIATIONS.—There are authorized to be appropriated to the Secretary such sums as are necessary to carry out this section each fiscal year. No funds allocated for this section shall come from funds allocated for the Office of Science.

TITLE VII—MISCELLANEOUS

SEC. 701. SENSE OF CONGRESS.

It is the sense of Congress that, among the programs and activities authorized in this Act, those that correspond to the recommendations of the National Academy of Sciences' 2005 report entitled "Rising Above the Gathering Storm" remain critical to maintaining long-term United States economic competitiveness, and accordingly shall receive funding priority.

SEC. 702. PERSONS WITH DISABILITIES.

For the purposes of the activities and programs supported by this Act and the amendments made by this Act, institutions of higher education chartered to serve large numbers of students with disabilities, including Gallaudet University, Landmark College, and the National Technical Institute for the Deaf and those with programs serving or those serving disabled veterans, shall receive special consideration and have a designation consistent with the designation for other institutions that serve populations underrepresented in STEM to ensure that institutions of higher education chartered to or serving persons with disabilities benefit from such activities and programs.

SEC. 703. VETERANS AND SERVICE MEMBERS.

In awarding scholarships and fellowships under this Act, an institution of higher education shall give preference to applications from veterans and service members, including those who have received or will receive the Afghanistan Campaign Medal or the Iraq Campaign Medal as authorized by Public Law 108–234 (10 U.S.C. 1121 note; 118 Stat. 655) and Executive Order No. 13363.

I. BILL

II. PURPOSE OF THE BILL

The purpose of the bill is to invest in innovation through research and development and to improve the competitiveness of the United States. It reauthorizes the National Science Foundation, the National Institute of Standards and Technology, the Department of Energy's Office of Science, and the Advanced Projects Agency—Energy at the Department of Energy. The bill also authorizes new innovation-focused programs at the Department of Commerce and an energy innovation hub program at the Department of Energy.

III. BACKGROUND AND NEED FOR THE LEGISLATION

TITLE I—SCIENCE AND TECHNOLOGY POLICY

Subtitle A—National Nanotechnology Initiative Amendments

The Science and Technology Committee was instrumental in the development and enactment of the 21st Century Nanotechnology Research and Development Act of 2003 (P.L. 108–153), which authorizes the interagency National Nanotechnology Initiative (NNI). The 2003 statute put in place formal interagency planning, budgeting, and coordinating mechanisms for NNI. The National Science and Technology Council (NSTC), through the Nanoscale Science, Engineering, and Technology (NSET) Subcommittee, plans and coordinates the NNI, and the National Nanotechnology Coordination Office (NNCO) provides technical and administrative support to the NSET. There are currently twenty-five Federal agencies that participate in the NNI, with 15 of those agencies reporting a nanotechnology research and development budget. The total NNI budget proposed for fiscal year 2011 is \$1.76 billion.

P.L. 108–153 also provides for formal reviews of the content and management of the program by the National Academy of Sciences

and by the NNI Advisory Panel, a statutorily created advisory committee of non-government experts. These reviews have found that the coordination and planning processes among the participating agencies in the NNI are largely effective. However, the formal reviews by external experts noted above, as well as the findings of the Committee's oversight hearings on the NNI, have identified aspects of the interagency program that could be strengthened and improved. These areas are environmental, health and safety research; technology transfer and the fostering of commercialization of research results; and educational activities.

Subtitle B—Networking and Information Technology Research and Development

The NITRD program, originally authorized in the High Performance Computing Act of 1991 (P.L. 102–194), is a multi-agency research effort to accelerate progress in the advancement of computing and networking technologies and to support leading edge computational research in a range of science and engineering fields. The 1991 statute established a set of mechanisms and procedures to provide for interagency planning, coordination, and budgeting of R&D activities carried out under the program. The NITRD Subcommittee of the NSTC is the working body for interagency planning and coordination and includes representatives from each of the participating NITRD agencies as well as the Office of Management and Budget (OMB) and the Office of Science and Technology Policy (OSTP). In fiscal year 2011 the 13 Federal agencies involved in the NITRD program requested a total budget of \$4.26 billion.

In August 2007, PCAST completed an assessment of the NITRD program and issued a report entitled, *Leadership Under Challenge: Information Technology R&D in a Competitive World*. The report indicates that while the U.S. remains the global leader in NIT, several countries, including China and India, are investing heavily in R&D and higher education. PCAST found that while the NITRD program has been effective at addressing the IT needs of the Federal agencies and the Nation, a number of changes are necessary to guarantee continued U.S. leadership in networking and information technology. Specifically, PCAST recommended improvements in the program's planning, prioritization and coordination functions; a rebalancing of the investment portfolio toward long-term, large-scale R&D; adjustments to the research content of the program; and a focus on workforce training through improved NIT education.

Subtitle C—Other OSTP Provisions

Science and technology have become increasingly more important in the national decision-making process, but the complexity of such issues requires long-term planning and coordination, as well as immediate program development and action. OSTP, often acting through the NSTC, plays a central role in guiding the course of the Nation's scientific enterprise. The need to establish a long-term, interagency vision for the preservation of Federal scientific collections, manufacturing research and development, and public access to federally funded research has emerged.

TITLE II—NATIONAL SCIENCE FOUNDATION

NSF is an independent Federal agency created by the National Science Foundation Act of 1950 (P.L. 81–507). NSF’s mission is unique among the Federal government’s scientific research agencies in that it is to support science and engineering across all disciplines. NSF currently funds research and education activities at more than 1,900 universities, colleges, and other public and private institutions throughout the United States, supporting more than 240,000 researchers, postdoctoral fellows, teachers, students and trainees. Virtually all of this support is provided through competitive, merit-reviewed grants and cooperative agreements. Although NSF’s research and development budget accounts for only about three percent of all federally funded research, the role of NSF in promoting fundamental research is vital to the Nation’s scientific research enterprise, as NSF provides approximately 20 percent of the Federal support for basic research conducted at academic institutions.

Basic research pays enormous dividends to society. Economic growth, public health, national defense, and social advancement have all been tied to technological developments resulting from research and development. The Administration’s Strategy for American Innovation, recognizes the importance of investing in fundamental research and STEM education as the basis for sustainable economic growth, and has the goal of increasing the amount of the Nation’s gross domestic product spent on research and development to 3 percent.

NSF has a central role to play in a national innovation strategy and needs to see steady growth over the long-term to maximize the agency’s potential contribution to the research enterprise. NSF is currently able to fund only about 25 percent of the grant proposals received each year because of limited funds; in some directorates, the percentage of grant proposals funded is as low as 10 percent. The \$3 billion received in the American Recovery and Reinvestment Act (P.L. 111–5) allowed NSF to fund a large number of previously declined, but highly rated proposals, raising NSF’s grant funding rate to 32 percent, the highest level since 2000. While the one-time investment in NSF through the Recovery Act was critical to keeping the scientific enterprise thriving and the brightest young people in the innovation pipeline, sustained growth will be necessary to maintain gains and in order to ensure future economic growth, and to strengthen homeland defense and national security.

NSF was most recently authorized by the 2007 America COMPETES Act (P.L. 110–69), which authorized appropriations for NSF for FY 2008 through FY 2010. In addition to continuing authorizations of appropriations for five more years, several policy and administrative issues—including ones related to the Foundation’s responsibilities for funding high-risk, high reward research, for supporting and spurring innovation, for supporting postdoctoral research fellowships, for funding STEM education programs, for broadening participation in STEM, and for implementing clear guidelines for the broader impacts review criterion—have arisen since the last authorization bill.

TITLE III—STEM EDUCATION

A consensus exists that improving science, technology, engineering, and math (STEM) education throughout the Nation is a necessary condition for preserving the U.S.'s capacity for innovation and discovery and for ensuring the nation's economic strength and competitiveness. A variety of STEM education programs and activities exist for K–16 students and teachers at the Federal research and development agencies. For the most part, agencies have developed their programs independently and without a strategic plan for accomplishing a set of overarching goals and objectives. Furthermore, each program, if it has been evaluated at all, utilizes a unique method of evaluation, making comparison of effectiveness across the programs impossible. Finally, the agencies have at times had trouble building widespread awareness of their programs among teachers and other practitioners. Many of the witnesses at the Research and Science Education Subcommittee hearings held in the 110th Congress testified that there is a need for improved interagency and intra-agency coordination of Federal STEM education efforts in order to better communicate best practices and eliminate inefficiencies.

In addition, several recent and high-profile reports have underscored the need to drastically improve STEM education in the United States, including: the National Academies' *Rising above the Gathering Storm*; the National Science Board's, *A National Action Plan for Addressing the Critical Needs of the U.S. Science, Technology, Engineering, and Mathematics Education System*; and the Carnegie-IAS Commission on Mathematics and Science Education's, *Opportunity Equation*. A key recommendation of the Board's action plan was the creation of a Committee on STEM Education under the National Science and Technology Council responsible for coordinating STEM education programs across Federal science agencies and the Department of Education.

In addition to the need for increased collaboration and communication among the agencies, many witnesses before the Committee and other stakeholders have suggested that agency activities need to be better aligned with the needs of STEM educators and state and local education agencies. Many have also called for increased coordination between Federal and non-Federal STEM education initiatives. The 2007 National Science Board report called for the establishment of a body that would facilitate improved communication and coordination between the Federal government and various public and private STEM education stakeholders.

TITLE IV—NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY

In NIST's Organic Act (P.L. 56–177), Congress directed NIST to work on "the solution of problems which arise in connection with standards" and to engage in the "determination of physical constants and the properties of materials, when such data are of great importance to scientific or manufacturing interests and are not to be obtained of sufficient accuracy elsewhere."

In its implementation of this almost endless scope of work, NIST has been a key central component in the U.S. Government's efforts to stimulate innovation, competitiveness, and in turn, job creation.

Since 1901, NIST has made key contributions to the development of integrated circuits, DNA diagnostic testing, digitized fingerprints, laser technology, closed-caption television, cholesterol testing, and cybersecurity, to name just a few. The Committee fully expects that NIST will make equally significant contributions in the next 100 years. Given its original Congressional mandate and its subsequent record, a NIST authorization was an important component of the America COMPETES Act (P.L. 110–69).

The original COMPETES legislation included the first comprehensive authorization of NIST in 15 years. That bill put funding for NIST’s labs and the Manufacturing Extension Partnership (MEP) program on a 10-year doubling path. It also replaced the 20-year-old Advanced Technology Program (ATP) with the Technology Innovation Program (TIP) to focus on small, high-tech, entrepreneurial firms and to encourage partnerships between these firms and universities.

However, the NIST authorization in the first COMPETES bill largely maintained the status quo at NIST. In the face of accelerating global competition in innovation and competitiveness, NIST programs and structure need to reflect this new reality. It is the Committee’s responsibility to ensure that NIST continues to support the innovation in the sciences and manufacturing.

TITLE V—INNOVATION

In recent years, there have been increased calls for the Federal Government to be more active and engaged in efforts to foster innovation in the United States, and to do a better job at coordinating the innovation activities of the Federal Government. The Secretary of Commerce recently announced the intent to establish an Office of Innovation and Entrepreneurship at the Department of Commerce to help answer these calls, but the Office has not been statutorily authorized. Along these same lines, there has been much discussion about the need for the Federal Government to be more involved in efforts to empower local communities to develop innovation strategies, including through the development of innovation clusters, to spur innovation at a regional level.

There is also widespread recognition that there is a need for small- and medium-sized manufacturers to retool themselves and innovate in order to remain competitive in the 21st century. The ability of small- and medium-sized manufacturers to implement innovative technologies in manufacturing is often limited, particularly by limited access to the capital necessary to retool. Many have encouraged the Federal Government to explore ways to ensure that small- and medium-sized manufacturers have the capital they need for these purposes.

TITLE VI—DEPARTMENT OF ENERGY

Subtitle A—Office of Science

Among its many recommendations the panel concluded that the government should increase its investment in its basic research portfolio, with special attention on the physical sciences, engineering, mathematics and the information sciences. The COMPETES Act followed on the panel’s recommendations by setting the Depart-

ment of Energy's Office of Science budget on a path to double in 7 years, along with the National Science Foundation and the National Institute of Standards and Technology. This follows roughly the funding trajectory set by the Energy Policy Act of 2005 by extending the authorizations an additional year to include fiscal year 2010. However, beyond an authorization of appropriations, the COMPETES Act did not include any program guidance for the Office of Science. While such guidance was provided for select Office of Science research areas within the Energy Policy Act 2005, as well as the Department of Energy High-End Computing Revitalization Act of 2004, to date the Office of Science has never had comprehensive statutory guidance for its major research programs.

The Office of Science is the single largest supporter of basic research in the physical sciences in the United States with a current budget of roughly \$5 billion, and manages 10 of the Department of Energy's 17 laboratories. Created over a half-century ago, the national laboratory system is a major component of the nation's research infrastructure. The ten Office of Science laboratories are:

- Ames Laboratory (Ames, IA).
- Argonne National Laboratory (Argonne, IL).
- Brookhaven National Laboratory (Upton, NY).
- Fermi National Accelerator Laboratory (Batavia, IL).
- Lawrence Berkeley National Laboratory (Berkeley, CA).
- Oak Ridge National Laboratory (Oak Ridge, TN).
- Pacific Northwest National Laboratory (Richland, WA).
- Princeton Plasma Physics Laboratory (Princeton, NJ).
- Stanford Linear Accelerator Center (Stanford, CA).
- Thomas Jefferson National Accelerator Facility (Newport News, VA).

The Office of Science oversees the construction and operation of some of the Nation's most advanced research and development user facilities, located at national laboratories and universities. These include supercomputers, particle accelerators, and x-ray light sources and neutron scattering facilities that enable the examination of materials and chemical processes for a wide range of industrial and basic energy research applications. In the 2009 fiscal year, these facilities were used by more than 22,000 researchers from universities, national laboratories, private industry, and other federal science agencies.

The Office of Science is a principal supporter of graduate students and postdoctoral researchers early in their careers. About a third of its research funding goes to support research at more than 300 colleges and universities nationwide. In addition, about half the users at user facilities are from colleges and universities. The Office of Science makes extensive use of peer review and federal advisory committees to develop general directions for research investments, to identify priorities, and to determine the best scientific proposals to support.

Subtitle B—Advanced Research Projects Agency—Energy

The Gathering Storm panel called on the federal government to create a new energy research agency (ARPA-E) within Department of Energy, patterned after the successful Defense Advanced Research Projects Agency (DARPA) within the Department of De-

fense. According to the Gathering Storm report, ARPA-E should be structured to:

“. . . sponsor creative, out-of-the-box, transformational, generic energy research in those areas where industry by itself cannot or will not undertake such sponsorships, where risks and potential payoffs are high, and where success could provide dramatic benefits for the Nation. . . . It would be designed as a lean, effective, and agile—but largely independent—organization that can start and stop targeted programs based on performance and ultimate relevance.”

The COMPETES Act of 2007 directed the Secretary of Energy to establish ARPA-E, and provided basic programmatic structure and guidance for the program. However, since funding from the American Recovery and Reinvestment Act of 2009 (\$400 million) and the Fiscal Year 2009 Omnibus Appropriations Act (\$15 million) allowed for the establishment of ARPA-E, fiscal year 2010 will be the first full year of operation for the new program.

ARPA-E borrows from the DARPA model in a number of ways that are intended to provide for agile management and rapid execution of high-risk, high-reward technology projects. Both utilize a flat reporting structure—the Director of ARPA-E reports directly to the Secretary of Energy—and both rely on a small team of highly technically qualified individuals to serve limited terms as Program Directors. Program Directors are given extraordinary resources and authority to make technical decisions, select research performers outside of the standard peer review process, and to carry successful projects through commercial application of the technology. The Director of ARPA-E may also exercise flexible hiring authority to quickly recruit these and other essential staff, and to compensate them at levels above standard federal pay scales. To attract non-traditional performers and negotiate intellectual property agreements ARPA-E also uses flexible contracting mechanisms called Technology Investment Agreements authorized for the Department as “Other Transactions Authority” in the Energy Policy Act of 2005.

To date, ARPA-E has issued three Funding Opportunity Announcements (FOA), and received applications for thousands of projects. Approximately 3700 concept papers were submitted for the first round of funding and, of those, 37 projects were ultimately chosen for awards. For that round, ARPA-E successfully completed awards within two months, which is considered by many to be a rapid pace for federal contracting. Second round FOA winners were announced in April, and it is expected that this and subsequent rounds will follow a similar pace for project selection and contracting.

Recognizing the high volume of applicants as evidence of a pent-up demand that exceeds the resources of ARPA-E, the Secretary held an ARPA-E Innovation Summit in early March of 2010. The Summit provided a forum for ARPA-E project awardees, finalists and others to exhibit their technology proposals, and for technology industries, the financial sector, academia and policymakers to discuss challenges faced in the development and adoption of advanced energy technologies. It is expected that ARPA-E will hold similar events in the future.

The COMPETES Act authorized appropriations for ARPA-E for fiscal years 2008 through 2010. In addition to extending authorizations, lessons learned in ARPA-E's first year indicate that further programmatic guidance is needed to ensure that it operates as the independent and agile program envisioned by the Gathering Storm panel and authorized by Congress in the COMPETES Act.

Subtitle C—Energy Innovation Hubs

As part of a larger effort to strengthen the role of the federal energy research enterprise as an instrument of U.S. technological innovation and economic growth, a number of new models for research have emerged. In the rollout of the FY 2010 budget request Secretary Chu announced the Administration's proposal to establish a system of Energy Innovation Hubs, modeled on the Bioenergy Research Centers established under the previous Administration. No statutory authorization exists specifically for Energy Innovation Hubs.

To accelerate scientific and technological solutions to certain grand energy challenges, an Energy Innovation Hub, as described by the Secretary, will comprise a highly collaborative team spanning many disciplines including science, engineering, economics, and public policy ideally, but not exclusively, working together under one roof. This is similar to the model of the Manhattan Project, which developed the atomic bomb, and the legendary Bell Laboratories, where the invention of the transistor and the development of information theory, among other things, helped make possible the semiconductor industry and the Internet.

Secretary Chu identified the following eight scientific areas as particularly resistant to the standard DOE research and development approach and thus appropriate for the focus of a Hub: (1) Fuels from Sunlight; (2) Nuclear Fuel Management; (3) Energy Efficient Building Systems; (4) Batteries and Energy Storage; (5) Solar Electricity; (6) Novel Carbon Capture and Storage; (7) Modeling and Simulation for Nuclear Reactors; and (8) Electrical Grid Systems.

The Administration requested \$280 million for FY2010 for the Hubs program with each Hub being funded \$25 million per year over five years and an additional \$10 million in the first year for start up costs. The funding was to be awarded on the basis of external peer-review of proposals submitted in response to a funding opportunity announcement (FOA), and awards contingent upon finalization and approval of DOE's FY2010 budget. However, Appropriators funded only three of the Hubs requested by the administration at \$22 million each which included Fuels from Sunlight, Energy Efficient Buildings and Modeling and Simulation for Nuclear Reactors. In the President's FY2011 budget request, there is an additional funding request for the Batteries and Energy Storage Hub.

IV. HEARING SUMMARY

During the 110th and 111th Congresses, the House Committee on Science and Technology held 33 hearings relevant to the activities authorized in the bill.

On May 15, 2007, the Subcommittee on Research and Science Education held a hearing entitled “Federal STEM Education Programs; Educators’ Perspective”. The purpose of the hearing was to inform the Subcommittee of educators’ experiences working science, technology, engineering, and math (STEM) education programs for K–16 students supported by federal R & D mission agencies and explore whether such issues as the lack of coordination between the agencies, difficulty by educators in finding information about the programs, and the absence of robust evaluation techniques hinder the potential of the Federal programs. Witnesses included: (1) Dr. Linda Froschauer, President, National Science Teachers Association; (2) Mr. Michael Lach, Director of Mathematics and Science, Chicago Public Schools; (3) Dr. George D. Nelson, Director, Science, Technology, and Mathematics Education, Western Washington University; (4) Mr. Van Reiner, President, Maryland Science Center; and (5) Dr. Iris Weiss, President, Horizon Research, Inc.

On June 6, 2007, the Subcommittee on Research and Science Education held a hearing entitled “Federal STEM Education Programs”. The purpose of the hearing was to review the K–16 science, technology, engineering, and mathematics (STEM) education activities of federal agencies and to explore current efforts for the improvement of interagency coordination and evaluation of programs. Witnesses included (1) Dr. Cora Marrett, Assistant Director, Directorate for Education and Human Resources, National Science Foundation and Co-Chair, Education and Workforce Development Subcommittee, National Science and Technology Council; (2) Dr. Joyce Winterton, Assistant Administrator, Office of Education, National Aeronautics and Space Administration; (3) Mr. William Valdez, Director, Office of Workforce Development for Teachers and Scientists, Office of Science, Department of Energy; and (4) Dr. Bruce Fuchs, Director, Office of Science Education, National Institutes of Health.

On October 10, 2007, the Subcommittee on Research and Science Education held a hearing entitled “Assessment of the National Science Board’s Action Plan for STEM Education”. The purpose of the hearing was to receive testimony on the National Science Board’s recommendations for bringing greater coherence to the Nation’s STEM education system, as laid out in their report, “A National Action Plan for Addressing the Critical Needs of the U.S. Science, Technology, Engineering, and Mathematics Education System.” Witnesses included: (1) Dr. Steven Beering, Chairman, National Science Board; (2) Ms. Judy A. Jeffrey, Director, Iowa Department of Education and Representing the Council of Chief State School Officers; (3) Dr. Francis (Skip) Fennell, President, National Council of Teachers of Mathematics and Professor of Education at McDaniel College; (4) Ms. Chrisanne Gayl, Director of Federal Programs, National School Boards Association; (5) Dr. Robert Semper, Executive Associate Director, The Exploratorium and Representing the Association of Science-Technology Centers; and (6) Ms. Susan L. Traiman, Director, Education and Workforce Policy Business Roundtable.

On April 16, 2008, the Committee on Science and Technology held a hearing entitled “The National Nanotechnology Initiative Amendments Act of 2008”. The purpose of the hearing was to review legislation that proposes changes to various aspects of the

planning and implementation mechanisms for and to the content of the National Nanotechnology Initiative (NNI). Witnesses included: (1) Mr. Floyd E. Kvamme, Co-Chair, President's Council of Advisors on Science and Technology; (2) Mr. Sean Murdock, Executive Director, NanoBusiness Alliance; (3) Dr. Joseph Krajcik, Associate Dean for Research and Professor of Education, University of Michigan; (4) Dr. Andrew Maynard, Chief Science Advisor, Project on Emerging Nanotechnologies, Woodrow Wilson Center; (5) Dr. Raymond Davis, Manager of Toxicology, BASF Corporation on behalf of the American Chemistry Council; and (6) Dr. Robert R. Doering, Senior Fellow and Research Strategy Manager, Texas Instruments and on behalf of the Semiconductor Industry Association.

On May 8, 2008, the Subcommittee on Research and Science Education held a hearing to receive comments on a discussion draft of the Fulfilling the Potential of Women in Academic Science and Engineering Act of 2008. The Subcommittee heard from three witnesses that included: (1) Dr. Lynda T. Carlson, Director, Division of Science Resource Statistics, Directorate for Social, Behavioral and Economic Sciences, National Science Foundation; (2) Dr. Linda G. Blevins, Senior Technical Advisor, Office of the Deputy Director for Science Programs, Office of Science, Department of Energy; and (3) Dr. Donna K. Ginther, Associate Professor of Economics and Director of the Center for Economic and Business Analysis, Institute for Policy Research, University of Kansas.

On July 31, 2008, the Committee on Science and Technology held a hearing entitled "Oversight of the Networking and Information Technology Research and Development (NITRD) Program" The purpose of the hearing was to review the multi-agency, coordinated Networking and Information Technology Research and Development (NITRD) program and examine the program in light of the assessment of the President's Council of Advisors on Science and Technology and explore whether additional legislative adjustments to the program were needed. Witnesses included: (1) Dr. Chris Greer, Director, NITRD National Coordination Office; (2) Dr. Daniel A. Reed, Director of Scalable and Multicore Computing, Microsoft; (3) Dr. Craig Stewart, Associate Dean, Research Technologies, Indiana University, and representing the Coalition for Academic Scientific Computing; and (4) Mr. Don C. Winter, Vice President—Engineering and Information Technology, Phantom Works, the Boeing Company.

On September 10, 2008, the Subcommittee on Energy and Environment held a hearing entitled "The Foundation for Developing New Energy Technologies: Basic Energy Research in the Department of Energy (DOE) Office of Science." The hearing examined the Basic Energy Sciences program in DOE's Office of Science, with a focus on stewardship of the major light and neutron source facilities as well as its initiatives to advance research for specific energy applications. Witnesses included: (1) Dr. Patricia Dehmer, Deputy Director of Science for the DOE Office of Science; (2) Dr. Steven Dierker, Associate Laboratory Director for Light Sources at Brookhaven National Laboratory; (3) Dr. Ernest Hall, Chief Scientist for Chemistry Technologies and Materials Characterization at GE Global Research; and (4) Dr. Thomas Russell, Professor of Polymer Science and Engineering at the University of Massachu-

setts at Amherst and Director of its Materials Research Science and Engineering Center on Polymers.

On February 26, 2009, the Subcommittee on Research and Science Education held a hearing entitled “Beyond the Classroom: Informal STEM Education”. The purpose of the hearing was to examine the role of informal environments in promoting STEM learning, including the potential for informal STEM learning to engage students in math and science in ways that traditional formal learning environments cannot and ways in which informal STEM education can complement and enhance classroom STEM studies. The witnesses included: (1) Dr. Joan Ferrini-Mundy, Division Director, Division of Research on Learning in Formal and Informal Settings, Education and Human Resources Directorate, National Science Foundation; (2) Dr. Phillip Bell, Professor, College of Education, the University of Washington, Seattle; (3) Ms. Andrea Ingram, Vice President of Education and Guest Experiences, Museum of Science and Industry-Chicago; (4) Mr. Robert Lippincott, Senior Vice President for Education, the Public Broadcasting Service; and (5) Dr. Alejandro Grajal, Senior Vice President of Conservation, Education, and Training, the Chicago Zoological Society.

On March 17, 2009, the Committee on Science and Technology held a hearing entitled “New Directions for Energy Research and Development at the U.S. Department of Energy.” The purpose of the hearing was to receive testimony from Secretary of Energy Steven Chu on the Administration’s near-term objectives and priority issues for the research and development (R&D) activities under the Offices of Science, Energy Efficiency and Renewable Energy, Fossil Energy, Nuclear Energy, Electricity Delivery and Energy Reliability, and the Loan Guarantee Program, as well as the Advanced Research Projects Agency—Energy. In addition, the hearing included testimony on the proposed Energy Innovation Hubs and how they differ from existing DOE programs.

On April 1, 2009, the Committee on Science and Technology held a hearing to receive testimony on the Networking and Information Technology Research and Development Act of 2009. Witnesses included: (1) Dr. Chris L. Greer, Director, National Coordination Office for Networking and Information Technology Research and Development; (2) Dr. Peter Lee, Professor and Head, Computer Science Department, Carnegie Mellon University; (3) Dr. Armit Yoran, Chairman and Chief Executive Officer, NetWitness Corporation; and (4) Dr. Deborah Estrin, Director, Center for Embedded Networked Sensing, University of California, Los Angeles.

On April 22, 2009, the Committee on Science and Technology held a hearing entitled “Monitoring, Measurement and Verification of Greenhouse Gas Emissions II: The Role of Federal and Academic Research and Monitoring Programs.” The hearing examined existing and planned federal programs focused on monitoring, measuring, and verifying sources and sinks of greenhouse gases, their atmospheric chemistry and their impacts on Earth’s climate. Witnesses included: (1) Dr. Alexander “Sandy” MacDonald, Director, Earth Systems Research Laboratory, National Oceanic and Atmospheric Administration; (2) Dr. Beverly Law, Professor, Global Change Forest Science, Oregon State University and Science Chair, AmeriFlux Network; (3) Dr. Richard Birdsey, Project Leader, Climate, Fire, and Carbon Cycle Science, USDA Forest Service, and

Chair, Carbon Cycle Scientific Steering Group; (4) Dr. Michael Freilich, Director, Earth Science Division, National Aeronautics and Space Administration; and (5) Ms. Dina Kruger, Director, Climate Change Division, Office of Atmospheric Programs, Environmental Protection Agency.

On June 9, 2009, the Subcommittee on Energy and Environment held a hearing entitled “Environmental Research at the Department of Energy.” The hearing examined the Department of Energy’s stewardship of its seven National Environmental Research Parks, as well as other climate and environmental research programs conducted by the DOE Office of Science. Witnesses included: (1) Dr. Paul Hanson, Ecosystem Science Group Leader at Oak Ridge National Laboratory; (2) Dr. David Bader, Director of the Program for Climate Model Diagnosis and Intercomparison; (3) Dr. Nathan McDowell, lead researcher in the Atmospheric, Climate, and Environmental Dynamics Group at Los Alamos National Laboratory; and (4) Dr. Whit Gibbons, Professor Emeritus of Ecology at the University of Georgia and Head of the Environmental Outreach and Education program at the Savannah River Ecology Laboratory.

On July 21, 2009, the Subcommittee on Research and Science Education held a hearing entitled “Encouraging the Participation of Female Students in STEM Fields.” The purpose of the hearing was to examine current research findings, best practices, and the role of the Federal agencies in increasing the interest of girls in STEM in primary and secondary schools, and addressing the challenges that deter young women from pursuing post-secondary STEM degrees. The witnesses included: (1) Dr. Alan I. Leshner, Chief Executive Officer, American Association for the Advancement of Science; (2) Dr. Marcia Brumit Kropf, Chief Operating Officer, Girls Incorporated; (3) Dr. Sandra Hanson, Professor of Sociology, Catholic University; (4) Ms. Barbara Bogue, Associate Professor of Engineering Science and Mechanics and Women in Engineering, Penn State College of Engineering; and (5) Ms. Cheryl Thomas, President, Ardmore Associates LLC.

On July 30, 2009, the Subcommittee on Research and Science Education held a hearing entitled “A Systems Approach to Improving K–12 STEM Education.” The purpose of the hearing was to examine how the many public and private stakeholders in an urban K–12 system can work together to improve STEM education inside and outside of the classroom. The witnesses included: (1) Dr. Wanda Ward, Acting Assistant Director, Directorate for Education and Human Resources, National Science Foundation; (2) Ms. Maggie Daley, Chair, After School Matters; (3) Mr. Michael Lach, Officer of Teaching and Learning, Chicago Public Schools; (4) Dr. Donald Wink, Director of Undergraduate Studies, Department of Chemistry, and Director of Graduate Studies, Learning Sciences Research Institute, University of Illinois at Chicago; and (5) Ms. Katherine Pickus, Divisional Vice President, Global Citizenship and Policy, Abbott.

On September 10, 2009, the Subcommittee on Energy and Environment held a hearing entitled “Biological Research for Energy and Medical Applications at the Department of Energy Office of Science.” The hearing examined biological research activities of the DOE Office of Science conducted through the Biological and Envi-

ronmental Research (BER) and Nuclear Physics (NP) programs. Witnesses included: (1) Dr. Anna Palmisano, Director of BER; (2) Dr. Jay Keasling, CEO of Joint BioEnergy Institute at Lawrence Berkeley National Laboratory; (3) Dr. Allison Campbell, Director of the WR Wiley Environmental Molecular Sciences Laboratory at the Pacific Northwest National Laboratory; (4) Dr. Ari Patrinos, President of Synthetic Genomics, Inc.; and (5) Dr. Jehanne Gillo, Facilities & Project Management Division Director of NP.

On September 24, 2009, the Subcommittee on Technology and Innovation held a hearing entitled “The Potential Need for Measurement Standards to Facilitate the Research and Development of Biologic Drugs.” The purpose of the hearing was to examine the need for the National Institute of Standards and Technology (NIST) to develop measurement standards and protocols to aid research and development of biologic drugs. Witnesses included: (1) Dr. Anthony Mire-Sluis, Executive Director, Global Product Quality and Quality Compliance, Amgen, Inc.; (2) Dr. Patrick Vink, Senior Vice President and Global Head of Biologics, Mylan GmbH; (3) Dr. Steven Kozlowski, Director, Office of Biotechnology Products, Office of Pharmaceutical Science, Center for Drug Evaluation and Research, U.S. Food and Drug Administration (FDA); and (4) Dr. Willie May, Director, Chemical Science and Technology Laboratory, NIST.

On October 1, 2009, the Subcommittee on Energy and Environment held a hearing entitled “Investigating the Nature of Matter, Energy, Space, and Time.” The hearing discussed the fundamental physics research activities of the DOE Office of Science conducted through the High Energy Physics (HEP) and Nuclear Physics (NP) programs and examined how these areas of study relate to the work of other DOE program offices and federal agencies.

On October 8, 2009, the Subcommittee on Research and Science Education held a hearing entitled “Investing in High-Risk, High-Reward Research.” The purpose of the hearing was to examine mechanisms for funding high-risk, potentially high-reward research, and the appropriate role of the Federal government in supporting such research. Witnesses included: (1) Dr. Neal F. Lane, Malcolm Gillis University Professor and Senior Fellow, James A. Baker III Institute for Public Policy, Rice University; (2) Dr. James P. Collins, Assistant Director for Biological Sciences, National Science Foundation; (3) Dr. Richard D. McCullough, Professor of Chemistry and Vice President of Research, Carnegie Mellon University; and (4) Dr. Gerald M. Rubin, Vice President and Director, Janelia Farm Research Campus, Howard Hughes Medical Institute.

On October 22, 2009, the Subcommittee on Research and Science Education held a hearing entitled “Engineering in K–12 Education.” The purpose of the hearing was to examine the potential benefits of, challenges to, and current models for incorporating engineering education at the K–12 level. Witnesses included: (1) Dr. Linda Katehi, Chair, National Academy of Engineering Committee on K–12 Engineering Education, and Chancellor, University of California, Davis; (2) Dr. Thomas Peterson, Assistant Director for Engineering, National Science Foundation; (3) Dr. Ioannis Miaoulis, President and Director, Museum of Science, Boston and Founder, National Center for Technological Literacy; (4) Dr. Darryll Pines, Dean and Nariman Farvardin Professor of Engineer-

ing, A. James Clark School of Engineering, University of Maryland, College Park; and (5) Mr. Rick Sandlin, Principal, Martha and Josh Morriss Mathematics and Engineering Elementary School, Texarkana, Texas.

On October 29, 2009, the Subcommittee on Energy and Environment held a hearing entitled “The Next Generation of Fusion Energy Research.” The hearing examined research activities on fusion energy conducted within the Office of Science’s Fusion Energy Sciences (FES) program and DOE’s National Nuclear Security Administration (NNSA), as well as the possibilities for international partnerships. Witnesses included: (1) Dr. Edmund Synakowski, Director of FES; (2) Dr. Stewart Prager, Director of the Princeton Plasma Physics Laboratory and former Chair of DOE’s Fusion Energy Sciences Advisory Committee; (3) Dr. Thom Mason, Director of Oak Ridge National Laboratory; and (4) Dr. Riccardo Betti, Assistant Director of the University of Rochester’s Laboratory for Laser Energetics.

On January 20, 2010, the Committee on Science and Technology held a hearing entitled “America COMPETES: Big Picture Perspectives on the Need for Innovation, Investments in R & D and a Commitment to STEM Education.” The purpose of the hearing was to examine the role that science and technology play in promoting economic security and maintaining U.S. competitiveness and to understand the perspective of the business community on the reauthorization of the America COMPETES Act. Witnesses included: (1) Mr. John Castellani, President, Business Roundtable; (2) Mr. Tom Donohue, President, U.S. Chamber of Commerce; (3) Governor John Engler, President, National Association of Manufacturers; and (4) Ms. Deborah Wince-Smith, President and CEO, Council on Competitiveness.

On January 21, 2010, the Subcommittee on Technology and Innovation held a hearing entitled “Commerce Department Programs to Support Job Creation and Innovation at Small and Medium-Sized Manufacturers.” The purpose of the hearing was to learn about the challenges faced by small and medium-sized manufacturers, as well as entrepreneurs marketing new technology, and to learn about Department of Commerce initiatives to address these challenges and examine how those programs can be made most effective for these enterprises. Witnesses included: (1) The Honorable Dennis F. High-tower, Deputy Secretary of Commerce, U.S. Department of Commerce (DOC); (2) Ms. Jennifer Owens, Vice President, Ann Arbor Spark; (3) Ms. RoseAnn B. Rosenthal, President and CEO, Ben Franklin Technology Partners of Southeastern Pennsylvania; and (4) Mr. Michael Coast, President, Michigan Manufacturing Technology Center.

On January 27, 2010, the Committee on Science and Technology held a hearing entitled “The Advanced Research Projects Agency—Energy (ARPA-E): Assessing the Agency’s Progress and Promise in Transforming the U.S. Energy Innovation System.” The purpose of the hearing was to review progress made on establishing ARPA-E and discuss what differentiates ARPA-E from other DOE programs, hear accounts of experiences with the agency’s first funding opportunities, examine the agency’s plans and goals for the coming years, and discuss ways in which ARPA-E may be improved through reauthorization of the America COMPETES Act. The wit-

nesses included: (1) Dr. Arun Majumdar, Director of ARPA-E; (2) Dr. Charles Vest, President of the National Academy of Engineering; (3) Dr. Anthony Atti, President and CEO of Phononic Devices, Inc.; and (4) Dr. John Pierce, Vice President of Technology at DuPont Applied BioSciences.

On February 4, 2010, the Subcommittee on Research and Science Education held a hearing entitled “Strengthening Undergraduate and Graduate STEM Education.” The purpose of the hearing was to examine STEM education in undergraduate and graduate institutions, including the role of the NSF in strengthening post-secondary STEM education. The witnesses included: (1) Dr. Joan Ferrini-Mundy, Acting Assistant Director for Education and Human Resources, National Science Foundation; (2) Mr. Rick Stephens, Senior Vice President for Resources and Administration, Boeing Company; (3) Dr. Noah Finkelstein, Associate Professor of Physics, University of Colorado at Boulder; (4) Dr. Karen Klomparens, Associate Provost and Dean for Graduate Education, Michigan State University; and (5) Dr. Robert Mathieu, Professor and Chair of Astronomy, University of Wisconsin-Madison.

On February 23, 2010, the Subcommittee on Research and Science Education held a hearing entitled “The State of Research Infrastructure at U.S. Universities.” The purpose of the hearing was to examine the research and research training infrastructure of our universities and colleges, including research facilities, and cyberinfrastructure capabilities, the capacity of the research infrastructure to meet the needs of U.S. scientists and engineers now and in the future, and the appropriate role of the Federal government in sustaining such infrastructure. Witnesses included: (1) Dr. Leslie Tolbert, Vice President for Research, Graduate Studies and Economic Development, University of Arizona; (2) Mr. Albert Horvath, Senior Vice President for Finance and Business, Pennsylvania State University; (3) Dr. John R. Raymond, Vice President for Academic Affairs and Provost, Medical University of South Carolina, and Chair, State of South Carolina EPSCoR Committee; and (4) Dr. Thom Dunning, Director of the National Center for Supercomputing Applications, University of Illinois at Urbana-Champaign.

On February 24, 2010, the Committee on Science and Technology held a hearing entitled “The Administration’s FY 2011 Research and Development Budget Proposal.” The purpose of the hearing was to receive testimony from Dr. John Holdren, Assistant to the President for Science and Technology and Director of the Office of Science and Technology Policy on the Administration’s proposed fiscal year 2011 funding for Federal research, development, demonstration, and commercial application programs and to examine the status of program authorized in the America COMPETES Act. Dr. Holdren also discussed Energy Innovation Hubs.

On February 24, 2010, the Subcommittee on Technology and Innovation held a hearing entitled “How Can NIST Better Serve the Needs of the Biomedical Research Community in the 21st Century?” The purpose of the hearing was to examine ways in which NIST could better serve the needs of the biomedical community. The witnesses included: (1) Dr. Thomas M. Baer, Executive Director, Stanford Photonics Research Center, Ginzton Lab; (2) Sharon F. Terry, MA, President and CEO, Genetic Alliance; and (3) Dr.

Daniel Sullivan, Professor and Vice Chair, Research in Radiology, Duke University Medical Center and Science Advisor, Radiologic Society of North America.

On March 3, 2010, the Committee on Science and Technology held a hearing entitled “The Department of Energy Fiscal Year 2011 Research and Development Budget Proposal.” The purpose of the hearing was to receive testimony from Secretary of Energy Steven Chu on the President’s Fiscal Year 2011 budget request for energy research and technology development programs at DOE, including activities under the Offices of Science, Energy Efficiency and Renewable Energy, Fossil Energy, Nuclear Energy, Electricity Delivery and Energy Reliability, the Advanced Research Projects Agency—Energy, and the Loan Guarantee Program.

On March 4, 2010, the Committee on Science and Technology held a hearing entitled “Reform in K–12 STEM Education.” The purpose of the hearing was to examine the role of Federal agencies in supporting improvements in K–12 STEM education and promoting STEM literacy in preparation for the reauthorization of the America COMPETES Act. The witnesses included: (1) Dr. Jim Simons, Founder and Chairman, Math for America; (2) Ms. Ellen Futter, President, American Museum of Natural History; (3) Dr. Gordon Gee, President, The Ohio State University; and (4) Dr. Jeffrey Wadsworth, President and CEO, Batelle Memorial Institute.

On March 10, 2010, the Subcommittee on Research and Science Education held a hearing entitled “The National Science Foundation’s FY 2011 Budget Request.” The purpose of the hearing was to examine the priorities in the National Science Foundation’s FY 2011 budget request, and to examine core activities, initiatives, and policy directions for research, infrastructure, education and workforce training at the Foundation. The witnesses included Dr. Arden Bement, Director of the National Science Foundation, and Dr. Steven Beering, Chair of the National Science Board.

On March 16, 2010, the Subcommittee on Research and Science Education held a hearing entitled “Broadening Participation in STEM.” The purpose of the hearing was to examine institutional and cultural barriers to broadening the participation of students from underrepresented groups pursuing degrees in STEM, efforts to overcome these barriers, and the role that Federal agencies can play in supporting these efforts. The witnesses included: (1) Dr. Shirley M. Malcom, Head of the Directorate for Education and Human Resources Programs, American Association for the Advancement of Science; (2) Dr. Alicia C. Dowd, Associate Professor of Higher Education, University of Southern California; (3) Dr. Keivan Stassun, Associate Professor of Physics & Astronomy, Vanderbilt University; (4) Dr. David Yarlott, President of Little Big Horn College; and (5) Ms. Elaine Craft, Director of the South Carolina Advanced Technological Education National Resource Center, Florence-Darlington Technical College.

On March 17, 2010, the Committee on Science and Technology held a hearing entitled “The Future of Manufacturing: What is the Role of the Federal Government in Supporting Innovation by U.S. Manufacturers?” The hearing examined the need for U.S. manufacturers to adopt innovative technologies and processes in order to remain globally competitive, and sought to determine the appropriate role for the Federal Government in supporting efforts by

U.S. manufacturers to innovate. Witnesses included: (1) Dr. Susan Smyth, Director of Manufacturing, GM R & D, and Chief Scientist for Manufacturing, General Motors Company; (2) Dr. Len Sauers, Vice President, Global Sustainability, Procter & Gamble; (3) Mr. Debtoosh Chakrabarti, President and Chief Operating Officer, PMC Group Inc., (4) Dr. Mark Tuominen, Director, National Nanomanufacturing Network; and (5) Mr. Wayne Crews, Vice President for Policy and Director of Technology Studies, Competitive Enterprise Institute.

On March 23, 2010, the Subcommittee on Technology and Innovation held a hearing entitled “NIST Structure and Authorities, Its Role in Standards, and Federal Agency Coordination on Technical Standards.” The purpose of the hearing was to review the proposed re-alignment of operational units at NIST, examine the current role that NIST plays in technical standards, and examine the need for federal agencies’ and departments’ coordination on technical standards. The witnesses included: (1) The Honorable Patrick Gallagher, Director, NIST; (2) Dr. James Serum, President, Scitek Ventures LLC, and past Chairman, NIST Visiting Committee on Advanced Technology (VCAT); (3) Mr. Craig Shank, General Manager, Interoperability at Microsoft; (4) Mr. Andrew Updegrove, Partner, Gesmer Updegrove LLC; and (5) Mr. Philip Wennblom, Director of Standards, Intel Corporation.

V. COMMITTEE ACTIONS

SUBCOMMITTEE ON ENERGY AND ENVIRONMENT

On March 25, 2010, the Subcommittee on Energy and Environment met to consider a Committee Print. The Committee Print was comprised of H.R. 4905, the Department of Energy Office of Science Authorization Act of 2010 (introduced by Representative Brian Baird on March 22, 2010), H.R. 4906, the ARPA-E Reauthorization Act of 2010 (introduced by Chairman Bart Gordon on March 22, 2010), and H.R. 4907, the Energy Innovation Hubs Authorization Act of 2010 (introduced by Representative Russ Carnahan on March 22, 2010). The Subcommittee considered the following amendments:

1. Mr. Baird offered a manager’s amendment to make several technical and clarifying changes to the print. The amendment was agreed to by voice vote.

2. Mr. Ehlers offered an amendment to strike a section and replace it with a new section detailing the mission and duties of the Office of Science. The amendment was agreed to by voice vote.

3. Mr. Ehlers offered an amendment to the authorization of Energy Frontier Research Centers to state that they will “conduct fundamental and use-inspired energy research to accelerate scientific breakthroughs related to needs identified” in certain reports. The amendment was agreed to by voice vote.

4. Mr. Lipinski offered an amendment directing the Office of Science to conduct outreach to increase the use of high-performance computer modeling and simulation capabilities by industry, including manufacturers. The amendment was agreed to by voice vote.

5. Mr. Garamendi offered an amendment to require that, after the release of a National Academies report on fusion energy research, the Secretary submit a plan to Congress describing the De-

partment's plan to incorporate any relevant recommendations from that report. The amendment was agreed to by voice vote.

6. Mr. Lipinski offered an amendment providing additional direction to the Office of Science Laboratories Infrastructure program's annual reporting requirements. The amendment was agreed to by voice vote.

7. Mr. Ehlers offered an amendment to strike the authorization levels specified for Basic Energy Sciences activities, Biological and Environmental Research activities, and Advanced Scientific Computing Research activities. The amendment was defeated by recorded vote (6–12).

8. Mrs. Biggert offered an amendment to lower the Office of Science authorization levels for each of the fiscal years 2011 through 2015. The amendment was withdrawn.

9. Mr. Diaz-Balart offered an amendment to all Titles of the Committee Print by striking the authorization of appropriations for fiscal years 2014 and 2015. The amendment was defeated by voice vote.

10. Mr. Bartlett offered an amendment requiring the ARPA–E Director to ensure that “at least 30 percent of applicants who are selected are a small business or partner with a small business.” The amendment was withdrawn.

11. Mr. Luján offered an amendment to increase the amount of appropriated funds that shall be used for technology transfer and outreach activities from 2.5 percent to 5 percent. The amendment was agreed to by voice vote.

12. Mr. Inglis offered an amendment limiting the amount that may be appropriated to ARPA–E for any fiscal year to \$300,000,000 unless the amount appropriated for that year to the Office of Science exceeds the amount appropriated for the previous fiscal year, adjusted for inflation. The amendment was defeated by voice vote.

13. Ms. Johnson offered an amendment to require that for at least 3 awards to consortia for Energy Innovation Hubs, the Secretary shall give special considerations to applications in which 1 or more of the institutions are 1890 Land Grant Institutions, Predominantly Black Institutions, Tribal Colleges or Universities, or Hispanic Serving Institutions. The amendment was withdrawn.

Mr. Baird moved that the Subcommittee favorably report the Committee Print, as amended, to the Full Committee. The motion was agreed to by voice vote.

SUBCOMMITTEE ON RESEARCH AND SCIENCE EDUCATION

On April 14, 2010, the Subcommittee on Research and Science Education met to consider a Committee Print. The Committee Print was based on the text of H.R. 4997, the National Science Foundation Authorization Act of 2010, which was introduced by Representative Daniel Lipinski on April 13, 2010. The Subcommittee considered the following amendments:

1. Mr. Lipinski offered a manager's amendment to make several technical and clarifying changes to the bill, and to add four new sections to the bill to: establish the National Center for Science and Engineering Statistics at the Foundation; authorize a program of grants to support partnerships between institutions of higher education and private sector entities that promote innovation and in-

crease the economic and social impact of research; and authorize the Director to award grants to support reform of undergraduate and graduate STEM education at institutions of higher education. The amendment was agreed to by voice vote.

2. Mr. Lipinski offered an amendment to add a new section to Title II of the bill authorizing a pilot program to award innovation inducement cash prizes in any area of research supported by the Foundation. The amendment was agreed to by voice vote.

3. Mr. Neugebauer offered an amendment to section 102 of the bill to strike all authorizations of appropriations for the Foundation for fiscal years 2014 and 2015. The amendment was defeated by recorded vote (4–7).

4. Mr. Neugebauer offered an amendment to section 203 of the bill to strike the list of manufacturing research areas allowed under this section. The amendment was defeated by voice vote.

5. Mr. Neugebauer offered an amendment to section 303 of the bill to strike the subsection that reduces the institutional matching requirement for the Robert Noyce Teacher Scholarship Program from 50 percent to 30 percent. The amendment was defeated by voice vote.

6. Ms. Johnson offered an amendment to add a new section to Title III of the bill requiring NSF to continue supporting the Historically Black Colleges and Universities-Undergraduate Program, the Tribal Colleges and Universities Program, and the Louis Stokes Alliances for Minority Participation program, as separate programs through September 30, 2011 and to develop and submit a plan to Congress for approval prior to any consolidation or realignment of those programs. The amendment was agreed to by voice vote.

7. Ms. Fudge offered an amendment to add a new section to Title III of the bill requiring the Director of NSF and the Secretary of Education to collaborate in identifying, prioritizing, and developing strategies to address grand challenges in pre-K–12 STEM research and development. The amendment was agreed to by voice vote.

8. Mr. Tonko offered an amendment to add a new section to Title III of the bill requiring the Director to award grants to institutions of higher education, nonprofit organizations, or consortia thereof, to provide research experiences for 10 or more undergraduate STEM students. The amendment was agreed to by voice vote.

Mr. Lipinski moved that the Subcommittee favorably report the Committee print, as amended, to the full Committee. The motion was agreed to by voice vote.

SUBCOMMITTEE ON TECHNOLOGY AND INNOVATION

On April 21, 2010, the Subcommittee on Technology and Innovation met to consider a Committee Print. The Committee Print was based on the text of H.R. 5794, the National Institute of Standards and Technology Authorization Act of 2010, introduced by Representative David Wu on April 20, 2010. The Subcommittee considered the following amendments:

1. Mr. Wu offered a manager's amendment which removed the duties of the Under Secretary for Standards and Technology as outlined in the Committee Print. The amendment also made the adjustment in the federal share of the MEP Centers to be a temporary adjustment for fiscal years 2011 through 2015 and requires

a report from the Secretary on the cost-share structure after FY 2015. The amendment was agreed to by voice vote.

2. Ms. Edwards amended the Committee Print by requiring the Director to give extra consideration to underrepresented minorities when evaluating applications for graduate, undergraduate, and postdoctoral fellowships. Her amendment also required the Director to give priority to applications from teachers from high-need schools for the NIST teacher science and technology enhancement program. The amendment was agreed to by voice vote.

3. Mr. Broun offered an amendment to reduce the number of authorization years for NIST from five to three years. The amendment was defeated by recorded vote (5–7).

4. Mr. Smith offered an amendment to clarify that the use of cybersecurity standards and guidelines developed by NIST for industry and public would not be mandatory. The amendment was agreed to by voice vote.

5. Mr. Luján offered an amendment that would require the Director to give special consideration to 1890 Institutions, Predominantly Black Institutions, Tribal Colleges and Universities, and Hispanic-serving institutions, when establishing university research centers under the bioscience section of the Committee Print. The amendment was agreed to by voice vote.

Mr. Wu moved that the Subcommittee favorably report the Committee Print, as amended, to the Full Committee. The motion was agreed to by voice vote.

FULL COMMITTEE

On April 22, 2010, Chairman Bart Gordon introduced H.R. 5116, the America COMPETES Reauthorization Act of 2010. The bill was based in part on the Committee Prints reported to the Full Committee by the Subcommittee on Energy and Environment, the Subcommittee on Research and Science Education, and the Subcommittee on Technology and Innovation.

On April 28, 2010, the Committee on Science and Technology met to consider H.R. 5116, the America COMPETES Reauthorization Act of 2010. The Committee agreed by unanimous consent to consider an Amendment in the Nature of a Substitute offered by Chairman Bart Gordon as original text for purposes of amendment. The Committee considered the following amendments:

1. Chairman Gordon offered a manager's amendment that made several technical and clarifying changes and amended the authorizations of appropriations in Sections 212, 402, and 611. The amendment was agreed to by voice vote.

2. Mr. Broun offered an amendment to the manager's amendment to modify the authorizations of appropriations. The amendment was defeated by recorded vote (11–24).

3. Mr. Diaz-Balart offered an amendment to the manager's amendment to modify the authorizations of appropriations. The amendment was defeated by recorded vote (11–25).

4. Mr. Diaz-Balart offered an amendment to the manager's amendment to strike all authorizations of appropriations after Fiscal Year 2013 for NSF, NIST, Office of Science, and ARPA-E. The amendment was defeated by voice vote.

5. Mr. Rohrabacher offered an amendment to the manager's amendment to strike the authorizations of appropriations for the

Advanced Research Projects Agency—Energy after Fiscal Year 2013. The amendment was defeated by voice vote.

6. Mr. Rohrabacher offered an amendment to the manager’s amendment to strike the authorization of appropriations for the Advanced Research Projects Agency—Energy after Fiscal Year 2015. The amendment was agreed to by voice vote.

7. Ms. Biggert offered an amendment to the manager’s amendment to modify the authorization of appropriations for the Advanced Research Projects Agency—Energy. The amendment was defeated by voice vote.

8. Ms. Johnson offered an amendment to insert a new section entitled “Fulfilling the Potential of Women in Academic Science and Engineering” and a new section entitled “Collection of Data on Demographics of Faculty.” The amendment was agreed to by voice vote.

9. Ms. Dahlkemper offered an amendment to Section 223 (“National Science Foundation Manufacturing Research”) to require the National Science Foundation to award grants to strengthen technical education and training in advanced manufacturing, including through the Foundation’s Advanced Technological Education program. The amendment was agreed to by voice vote.

10. Mr. Inglis offered an amendment to Section 228 (“Prize Awards”) to prohibit the use of Federal funds to engage in the research for which the prize is being awarded. The amendment was agreed to by voice vote.

11. Ranking Member Hall offered an amendment to insert a new section to repeal the Academic Research Facilities Modernization program at the National Science Foundation. The amendment was defeated by voice vote.

12. Mr. Neugebauer offered an amendment to Section 243 (“Robert Noyce teacher scholarships program”) to strike amendments to Section 10A of the National Science Foundation Authorization Act of 2002. The amendment was withdrawn.

13. Mr. Neugebauer offered an amendment to Section 243 (“Robert Noyce teacher scholarships program”) to prohibit the use of funds by an institution of higher education to engage in capacity building activities. The amendment was withdrawn.

14. Mr. Neugebauer offered an amendment to Section 243 (“Robert Noyce teacher Scholarships Program”) to require that the matching requirement be provided in cash. The amendment was agreed to by voice vote.

15. Mr. Ehlers offered an amendment to Section 248 (“Transforming Undergraduate Education in STEM”) to add a provision stating that uses of funds under the section may include support for initiatives that advance integration of global challenges such as sustainability into disciplinary and interdisciplinary STEM education. The amendment was agreed to by voice vote.

16. Mr. Wilson offered an amendment to Section 251 (“Grand Challenges in Education Research”) to specify that students in rural schools should be included in the diverse learning populations to be considered in developing research grand challenges. The amendment was agreed to by voice vote.

17. Mr. Bartlett offered an amendment to Section 253 (“Laboratory Science Pilot Program”) to repeal subparagraphs (B), (C), (D),

(E), and (F) of Section 8(8) of the National Science Foundation Act of 2002. The amendment was withdrawn.

18. Mr. Wu offered an amendment to insert a new section authorizing the National Science Foundation to award grants for the purpose of providing integrated internship experiences for undergraduate students that connect private sector internship experiences with the students' STEM coursework. The amendment was agreed to by voice vote.

19. Mr. Bartlett offered an amendment to Mr. Wu's amendment to require a 50 percent non-Federal cost share from partnerships established or expanded and to restrict the use of Federal funds provided under certain circumstances. The amendment was agreed to by voice vote.

20. Mr. Lujan offered an amendment to insert a new section to require the Director of the National Science Foundation to continue to support the Tribal Colleges and Universities program, to specify certain activities that grants awarded under the program shall support, and to permit funding to be used for instrumentation. The amendment was agreed to by voice vote.

21. Mr. Diaz-Balart offered an amendment to strike all authorizations of appropriations for fiscal years after fiscal year 2013 for the following sections: 303(c) ("Energy Applied Science Talent Expansion Program for Institutions of Higher Education"); Section 502 ("Federal Loan Guarantees for Innovative Technologies in Manufacturing"); Section 503 ("Regional Innovation Program"); and Section 632 ("Energy Innovation Hubs"). The amendment was withdrawn.

22. Mr. McCaul offered an amendment to insert a new section authorizing the Secretary of Energy to provide funds to the National Science Foundation for the Integrative Graduate Education and Research Traineeship program and to contribute funds to curriculum development activities at the National Science Foundation for the purpose of improving undergraduate and graduate interdisciplinary engineering and architecture education related to design and construction of high performance buildings. The amendment was agreed to by voice vote.

23. Ranking Member Hall offered an amendment to Section 404 ("Reorganization of NIST Laboratories") to modify the mission of the Engineering Laboratory. The amendment was agreed to by voice vote.

24. Mr. Broun offered an amendment to strike Title V ("Innovation"). The amendment was defeated by recorded vote (8–25).

25. Mr. Ehlers offered an amendment to Section 502 ("Federal Loan Guarantees for Innovative Technologies in Manufacturing") by adding to the list of items that the Secretary of Commerce must address in final regulations for the program criteria that the Secretary shall use to determine whether a borrower demonstrates that a market exists for the innovative technology product, or the integral component of such product, to be manufactured. The amendment was agreed to by voice vote.

26. Mr. Bartlett offered an amendment to Section 502 ("Federal Loan Guarantees for Innovative Technologies in Manufacturing") to require that the Secretary of Commerce promulgate regulations and policies to carry out the manufacturing loan guarantee pro-

gram in accordance with OMB Circular A-129. The amendment was agreed to by voice vote.

27. Mr. Bilbray offered an amendment to Section 502 (“Federal Loan Guarantees for Innovative Technologies in Manufacturing”) to state that it is the Sense of Congress that no loan guarantee shall be made under the program unless the borrower agrees to use a federally-approved electronic employment verification system to verify employment eligibility. The amendment was agreed to by voice vote.

28. Mr. Lipinski offered an amendment to Section 603 (“Mission of the Office of Science”) to require the Director to develop a plan to increase the percentage of domestically sourced hardware for projects of Office of Science. The amendment was agreed to by voice vote.

29. Ms. Biggert offered an amendment to Section 603 (“Mission of the Office of Science”) to require that, as part of the President’s annual budget request, the Secretary include a detailed summary of the degree to which current research activities are competitive and merit-reviewed. The amendment was agreed to by voice vote.

30. Mr. Inglis offered an amendment to Section 605 (“Biological and Environmental Research Program”) to include hydrogen among the targeted research, development, and demonstration biological systems science activities. The amendment was agreed to by voice vote.

31. Mr. Smith offered an amendment to Section 605 (“Biological and Environmental Research Program”) to include requirements for a research plan for Biological System Science activities. The amendment was agreed to by voice vote.

32. Mr. Olson offered an amendment to strike Subsection 605(c) (“Climate and Environmental Sciences Activities”). The amendment was defeated by voice vote.

33. Mr. Neugebauer offered an amendment to Section 622 (“ARPA-E Amendments”) to require the Director to ensure that projects with a high potential to result in technology advances that enable reductions in imports of energy from foreign sources receive the highest priority consideration. The amendment was defeated by voice vote.

34. Mr. Smith offered an amendment to Section 622 (“ARPA-E Amendments”) to require applicants to disclose prior efforts and investments in proposed projects and to justify funding projects with prior industry support. The amendment was agreed to by voice vote.

35. Mr. Olson offered an amendment to Section 622(4), in the proposed subsection (f), by striking “shall” and inserting “may”, and to Section 622(5) by striking subparagraph (F) thereby restoring certain existing statutory limitations on staffing at ARPA-E. The amendment was withdrawn.

36. Ms. Biggert offered an amendment to Section 632 (“Energy Innovation Hubs”) by striking the paragraph entitled “TestBed and Renovation Exception”. The amendment was withdrawn.

37. Ms. Johnson offered an amendment to Section 632 (“Energy Innovation Hubs”) to direct the Secretary to give priority consideration to applications in which 1 or more of the institutions under subsection (b)(1)(A) are 1890 Land Grant Institutions, Predominately Black Institutions, Tribal Colleges or Universities, or His-

panic Serving Institutions. The amendment was agreed to by voice vote.

38. Ranking Member Hall offered an amendment to Section 632 (“Energy Innovation Hubs”) to expand the definition of “advanced energy technologies” to include technologies to enable expanded supply and production of conventional domestic sources of energy such as coal, oil and natural gas. The amendment was agreed to by voice vote.

39. Mr. Peters offered an amendment to Section 632 (“Energy Innovation Hubs”) by adding to the list of definitions of Advanced Energy Technologies innovative technology “that enables advanced vehicles, vehicle components, and related technologies that result in significant energy savings”. The amendment was agreed to by voice vote.

40. Ms. Biggert offered an amendment to Section 632 (“Energy Innovation Hubs”) to insert “including the Department of Energy Federally Funded Research and Development Centers” after “Federal entity.” The amendment was agreed to by voice vote.

41. Mr. Lujan offered an amendment to Title VI (“Department of Energy”) to add a new subtitle entitled “Cooperative Research and Development Fund” and require the Secretary to make funds available to the Department of Energy National Laboratories for the Federal share of cooperative research and development agreements. The amendment was agreed to by voice vote.

42. Ms. Biggert offered an amendment to Mr. Lujan’s amendment to insert the requirement that no funds allocated for this section shall come from funds allocated for the Office of Science. The amendment was agreed to by voice vote.

43. Mr. Bartlett offered an amendment to add a new title to the bill expressing a Sense of Congress that programs that correspond to the recommendations of the National Academy of Sciences’ 2005 report entitled “Rising Above the Gathering Storm” remain critical to maintaining long-term United States economic competitiveness and shall receive priority funding. The amendment was agreed to by voice vote.

44. Mr. Broun offered an amendment to add a new title which states that none of the funds authorized to be appropriated may be used to lobby any person or entity. The amendment was withdrawn.

45. Ranking Member Hall offered an amendment to add a new title to the bill to state that institutions of higher education chartered to serve large numbers of students with disabilities and those with programs serving or those serving disabled veterans shall receive special consideration and have a designation consistent with the designation for other institutions that serve populations underrepresented in STEM. The amendment was agreed to by voice vote.

46. Ranking Member Hall offered an amendment to add a new title to the bill to state that, in awarding scholarships and fellowships under the bill, an institution of higher education shall give preference to applications from veterans and service members. The amendment was agreed to by voice vote.

47. Mr. Neugebauer offered an amendment to add a new title to the bill to state that no funds authorized to be appropriated in Section 212, Section 303, Section 402, Section 502, Section 503, Section 611, Section 622, and Section 632 are authorized to be appropriated

that exceed authorizations for such purposes for Fiscal Year 2010 before the end of the first fiscal year for which the Director of the Congressional Budget Office certifies to the Congress in writing that the Federal Government does not have a budget deficit. The amendment was defeated by recorded vote (8–23).

48. Mr. Neugebauer offered an amendment to add a new title to change the effective date of the Act to the first January 1 occurring after the date of enactment and after the conclusion of a fiscal year in which the Federal Government did not have a budget deficit. The amendment was withdrawn.

49. Mr. Rohrabacher offered an amendment to add a new title to the bill which prohibits the use of funds authorized in the bill for projects unless all persons receiving funds are United States citizens and all entities receiving funds are headquartered in the United States. The amendment was defeated by voice vote.

50. Mr. Rohrabacher offered an amendment to add a new title to the bill which prohibits the use of funds authorized in the bill for research and development unless all entities involved in such research and development agree not to use any developed and related technologies for manufacturing outside of the United States. The amendment was defeated by voice vote.

51. Mr. Rohrabacher offered an amendment to add a new title to the bill which prohibits funding to any person or entity found guilty of infringing on the patent rights of any other person or entity. The amendment was withdrawn.

52. Mr. Rohrabacher offered an amendment to add a new title to the bill which states that intellectual property rights from technologies developed using funds authorized in the bill shall be apportioned to the granting agency in direct proportion to the funds granted to the total project cost. The amendment was defeated by recorded vote (12–22).

53. Mr. Broun offered an amendment to strike Section 228 (“Prize Awards”), Section 407 (“Bioscience Research Program”), Section 502 (“Federal Loan Guarantees for Innovative Technologies in Manufacturing”), Section 503 (“Regional Innovation Program”), Subtitle C of Title VI (“Energy Innovation Hubs”), and Subsections (b) (“Innovative Services Initiative”) and (c) (“Reports”) in Section 406 (“Manufacturing Extension Partnership”). The amendment was defeated by recorded vote (9–25).

54. Mr. Bilbray and Mr. Garamendi offered an amendment to Section 607 (“Fusion Energy Research Program”) to require that the Director carry out activities to develop technologies necessary to enable reliable, sustainable, safe, and economically competitive operation of a commercial fusion power plant. The amendment was agreed to by voice vote.

55. Mr. Bartlett offered an amendment to Subsection 622(k) (“Events”) to direct that funding for activities described in paragraph (1) shall be provided as part of the technology transfer and outreach activities authorized under subsection (o)(4)(B). The amendment was agreed to by voice vote.

Chairman Gordon moved that the Committee favorably report the H.R. 5116, as amended, to the House. The motion was agreed to by recorded vote (29–8).

VI. SUMMARY OF MAJOR PROVISIONS OF THE BILL

Title I makes amendments to the National Nanotechnology program and the National Information Technology Research and Development program and requires the Director of the Office of Science and Technology to develop a policy and clearinghouse for federal scientific collections. It also establishes an interagency committee under the National Science and Technology Council to coordinate manufacturing-related research and development and establishes an interagency working group focused on access to and stewardship of the results of federally funded research. In addition, it authorizes a program of workshops, the collection of data, and the development of uniform policies related to gender bias in academic science and engineering.

Title II authorizes funding for the National Science Foundation, makes administrative amendments relating to the National Science Board, includes provisions relating to the Foundation's broader impacts review criterion, establishes the National Center for Science and Engineering Statistics, and requires the Director to report data on the demographics of STEM faculty at institutions of higher education. Title II also requires support for high-risk, high-reward research and authorizes programs for interdisciplinary research collaborations, manufacturing research and education, partnerships between institutions of higher education and private sector entities, and innovation inducement cash prizes. Title II includes provisions to strengthen institutional research partnerships and requires a report on mid-scale research instrumentation. In addition, Title II includes restrictions on funding for the Integrative Graduate Education and Research Traineeship Program, establishes postdoctoral fellowship programs (including one in STEM education), makes changes to the match requirement under the Robert Noyce Teacher Scholarship program, includes provisions relating to institutions of higher education chartered to serve students with disabilities, authorizes grants for institutional integration, requires education and training on effective tools to increase participation in STEM by underrepresented groups, establishes grant programs to reform undergraduate and graduate STEM education, and prohibits consolidation of the Historically Black Colleges and Universities Undergraduate Program, the Louis Stokes Alliances for Minority Participation program, and the Tribal Colleges and Universities Program. Title II requires the development of strategies to address grand challenges in research and development for K–12 STEM education, provides for grants for research experiences for undergraduate students, extends the laboratory science pilot program, authorizes grants for private sector internship experiences for undergraduate students, and authorizes grants to tribal colleges and universities to enhance STEM education.

Title III establishes an interagency committee to coordinate Federal STEM education programs, creates an advisory committee on STEM education, clarifies the role of the Department of Energy relating to STEM education, and authorizes the Secretary of Energy to contribute funds to National Science Foundation programs for activities related to the design and construction of high performance buildings.

Title IV authorizes funding for the National Institute of Standards and Technology (NIST), creates a new position of Under Secretary of Standards and Technology at the Department of Commerce, reorganizes the operational units at NIST, and assigns the Director of NIST responsibilities relating to the development of international technical standards. Title IV requires MEP centers to work with local community colleges, creates an innovative services initiative, requires a review of the MEP program using the Malcolm Baldrige criteria, and reduces the required MEP cost share. Title IV establishes a bioscience research program and increases the number of members on the Visiting Committee on Advanced Technology. Finally, Title IV requires the Director to establish an emergency communication and tracking technologies research initiative, requires the Director to give consideration to the goal of broadening participation by underrepresented minorities with respect to existing fellowship programs and to give special consideration to teachers from high-needs schools with respect to the teacher science and technology enhancement program, and provides clarification on the use of cybersecurity standards and guidelines.

Title V establishes an Office of Innovation and Entrepreneurship at the Department of Commerce and creates an Advisory Council on Innovation and Entrepreneurship. Title V also requires the Secretary of Commerce to establish a federal loan guarantee program for innovative technologies in manufacturing. Finally, Title V requires the Secretary of Commerce to establish a regional innovation program.

Title VI directs the Secretary of Energy to carry out research activities in science, including through programs in basic energy sciences, biological and environmental research, advanced scientific computing research, fusion energy sciences, high energy physics, and nuclear physics. Title VI authorizes funding for the activities of the Office of Science. Title VI also authorizes funding for the Advanced Research Projects Agency—Energy and makes changes to the program. Finally, Title VI establishes a program to create Energy Innovation Hubs at the Department of Energy and directs the Secretary of Energy to make funds available to National Laboratories to pay the federal share of cooperative research and development agreements.

Title VII includes a Sense of Congress relating to the recommendations of the National Academy of Sciences, requires special consideration for institutions of higher education chartered to serve large numbers of students with disabilities and those serving disabled veterans, and requires preference to applications from veterans and service members for scholarships and fellowships.

VII. SECTION-BY-SECTION ANALYSIS

Sec. 1. Short title.—“America COMPETES Reauthorization Act of 2010”

TITLE I—SCIENCE AND TECHNOLOGY POLICY

Subtitle A—National Nanotechnology Initiative Amendments

Sec. 101. Short title.—“National Nanotechnology Initiative Amendments Act of 2010.”

Sec. 102. National Nanotechnology Program Amendments.—Modifies the NNI strategic plan to include the specification of: (1) near and long term objectives, (2) the timeframe for achieving near term objectives, (3) the metrics for measuring progress toward objectives, and (4) multi-agency funded projects in areas of significant economic and societal impacts authorized under section 105. Requires the National Nanotechnology Coordination Office (NNCO) to (1) develop a public database for projects funded under the Environmental, Health and Safety (EHS), Education and Societal Dimensions, and Nanomanufacturing program component areas; (2) develop, maintain and publicize information about NNI supported nanotechnology facilities available for use by academia and industry; (3) to report annually on its current and future budget requirements. Revises the charge to the National Academy of Sciences' National Research Council for the content and scope of the triennial reviews of the NNI Program.

Sec. 103. Societal dimensions of nanotechnology.—Requires an OSTP associate director to fulfill the role of coordinator for the societal dimensions component of NNI, and assigns specific responsibilities and duties to such coordinator. Requires the Program to support formal and informal nanotechnology science education, including support for course development, and faculty professional development. Requires formation of an Education Working Group to coordinate, prioritize, and plan the educational activities funded under the NNI.

Sec. 104. Technology transfer.—Requires agencies supporting nanotechnology research facilities under the NNI to allow, and encourage, use of these facilities to assist companies in developing prototype products, devices, or processes for determining proof of concept. Requires agencies to encourage applications for support of nanotechnology projects under the SBIR, STTR, and TIP programs. Encourages the creation of industry liaison groups in all relevant industry sectors to foster technology transfer and to help guide the NNI research agenda.

Sec. 105. Research in areas of national importance.—Requires the NNI to include support for large-scale nanotechnology research and development activities in application areas with potential for significant contributions to national economic competitiveness or other important societal benefits.

Sec. 106. Nanomanufacturing research.—Specifies specific areas of research and development under the Nanomanufacturing program component area. Requires the NNI Advisory Panel to review the adequacy of the funding level for the Nanomanufacturing program component area and its relevance to industry needs.

Sec. 107. Definitions.—Defines terms used in the subtitle.

Subtitle B—Networking and Information Technology Research and Development

Sec. 111. Short Title.—“Networking and Information Technology Research and Development Act of 2010”.

Sec. 112. Program planning and coordination.—Requires the NITRD agencies to periodically assess the program contents and funding levels and to update the program accordingly. Requires the NITRD agencies to develop and periodically update (at 3-year intervals) a strategic plan for the program and requires an annual

update on how the program activities planned and underway relate to the objectives specified in the strategic plan.

Sec. 113. Large-scale research in areas of national importance.—Authorizes the NITRD agencies to support large-scale, long-term, interdisciplinary research with the potential to make significant contributions to society and U.S. economic competitiveness and to encourage collaboration between at least two agencies as well as cost-sharing from non-Federal sources.

Sec. 114. Cyber-physical systems and information management.—Requires the program to support research and development in cyber-physical systems; human-computer interactions, visualization, and information management. Requires the NCO Director to convene a university/industry task force to explore mechanisms for carrying out collaborative research and development activities for cyber-physical systems.

Sec. 115. National coordination office.—Formally establishes the NCO; delineates the office's responsibilities; mandates annual operating budgets; specifies the source of funding for the office (consistent with current practice); and stresses the role of the NCO in developing the strategic plan and in public outreach and communication with outside communities of interest.

Sec. 116. Improving networking and information technology education.—Requires NSF use their programs to improve the teaching and learning of networking and information technology and encourage the participation of women and underrepresented minorities.

Sec. 117. Conforming and technical amendments.—Makes conforming and technical changes to the High-Performance Computing Act of 1991.

Subtitle C—Other OSTP Provisions

Sec. 121. Federal scientific collections.—Requires the Office of Science and Technology Policy (OSTP), in consultation with relevant Federal agencies, to develop formal policies for the management and use of Federal scientific collections, including policies for the disposal of collections, and to create an online clearinghouse for information on the contents of and access to Federal scientific collections.

Sec. 122. Coordination of manufacturing research and development.—Establishes an interagency committee under the National Science and Technology Council (NSTC) with responsibilities to plan and coordinate Federal programs and activities in manufacturing research and development and to develop a strategic plan.

Sec. 123. Interagency Public Access Committee.—Requires OSTP to establish a working group under the NSTC to coordinate Federal science agency policies related to the dissemination and long-term stewardship of the results of unclassified federally funded research. Requires OSTP to solicit input and recommendations from and to collaborate with non-Federal stakeholders in the development of any policies related to public access and requires OSTP to submit a report to Congress within 1 year describing the status of any such policies and how stakeholder input was incorporated.

Sec. 124. Fulfilling the potential of women in academic science and engineering.—Authorizes a program of workshops to minimize gender bias in academic science and engineering for Federal science agencies; requires Federal science agencies to collect and

report composite data, including demographic data, on Federal research and development grants; and requires OSTP to develop uniform Federal policies to ensure that Federally funded researchers with caregiving responsibilities can maintain their research programs while attending to those responsibilities.

TITLE II—NATIONAL SCIENCE FOUNDATION

Sec. 201. Short title.—“The National Science Foundation Authorization Act of 2010”.

Subtitle A—General Provisions

Sec. 211. Definitions.—Provides definitions for terms used in this title.

Sec. 212. Authorization of appropriations.—Authorizes \$44 billion for the National Science Foundation (NSF) for fiscal years 2011–2015, including \$35.2 billion for research and related activities (R&RA), \$5.5 billion for education and human resources (EHR), and \$1.2 billion for major research equipment and facilities construction (MREFC).

Sec. 213. National science board administrative amendments.—Eliminates the cap on the number of professional staff for the National Science Board (“the Board”). Changes the date on which the Board’s biennial Science and Engineering Indicators is due to the President and Congress. Modifies the scope of reports the Board may submit to the President and Congress. Modifies audit requirement for Board adherence to the Sunshine Act.

Sec. 214. Broader impacts review criterion.—Clarifies the intent of the Foundation’s Broader Impacts Review Criterion. Requires the Director to develop and implement a Foundation-wide policy that: includes a plan to educate Foundation staff, merit review panels, and grant applicants on the goals of the broader impacts review criterion; encourages colleges, universities and other organizations such as science museums to help NSF-funded investigators achieve the goals of the broader impacts review criterion through existing evidence-based programs and activities; and requires grant applicants to provide evidence of such institutional support for the portion of their proposal intended to satisfy the broader impact review criterion.

Sec. 215. National Center for Science and Engineering Statistics.—Establishes the Foundation’s Division of Science Resource Statistics as the National Center for Science and Engineering Statistics and codifies its function as the central federal clearinghouse for objective data on the scientific and engineering enterprise and the state of STEM education.

Sec. 216. Collection of data on demographics of faculty.—Requires the Director to report statistical summary data on the demographics of STEM faculty at institutions of higher education in the United States.

Subtitle B—Research and Innovation

Sec. 221. Support for potentially transformative research.—Requires the Director to apply at least 5 percent of the agency’s research toward high-risk, high-reward basic research. Provide a def-

inition for “high-risk, high-reward” and examples for how the Director may meet the 5 percent requirement.

Sec. 222. Facilitating interdisciplinary collaborations for national needs.—Requires the Director to provide awards for interdisciplinary research collaborations that are designed to address critical challenges to national security, competitiveness, and societal well-being.

Sec. 223. National Science foundation manufacturing research and education.—Requires the Director to carry out a program to award competitive grants for manufacturing research and requires the Director to award grants to strengthen advanced manufacturing education and training.

Sec. 224. Strengthening institutional research partnerships.—In cases where a research grant involves a partnership of colleges and universities, including a minority-serving institution or a predominately undergraduate institution, the Director is required to award funds to at least two of the institutions directly, including at least one minority-serving or predominately undergraduate institution.

Sec. 225. National Science Board report on mid-scale instrumentation.—Requires the Board to evaluate the need for mid-scale research instrumentation (instrumentation that falls between the Major Research Instrumentation program and the Major Research Equipment and Facilities Construction program), and provide recommendations regarding how the Foundation can best address those needs.

Sec. 226. Sense of Congress on overall support for research infrastructure at the Foundation.—Expresses the sense of Congress that the Foundation should strive to keep the percentage of the Foundation budget devoted to research infrastructure in the range of 24 to 27 percent, as recommended in the 2003 National Science Board report, “Science and Engineering Infrastructure for the 21st Century.”

Sec. 227. Partnerships for innovation.—Requires the Director to carry out a program to support partnerships between institutions of higher education and private sector entities in order to promote innovation and increase the economic and social impact of the research. Gives priority to partnerships that involve one of the top 100 research institutions and either a minority-serving institution, a primarily undergraduate institution, or a 2-year college.

Sec. 228. Prize awards.—Requires the Director to establish a 3-year pilot program to award innovation inducement cash prizes in research areas supported by the Foundation.

Subtitle C—Stem Education and Workforce Training

Sec. 241. Graduate student support.—Requires the Director to increase or decrease funding for the Integrative Graduate Education and Research Traineeship (IGERT) program at the same rate as the Graduate Research Fellowship (GRF) program. Requires that at least half of the total funds for IGERT and GRF come from the R&RA account. Requires the Director to increase the current cost of education allowance for awards made through the GRF program by \$1,500.

Sec. 242. Postdoctoral fellowship in stem education research.—Requires the Director to establish a postdoctoral fellowship program to encourage recent doctoral degree graduates in the STEM

fields to pursue STEM education research and become leaders in STEM education reform.

Sec. 243. Robert Noyce Teacher Scholarship Program.—Lowers the required amount of institutional matching for Noyce grants under Section 10A (master teachers and STEM professionals) from 50 to 30 percent and requires that the institutional match be met in cash only.

Sec. 244. Institutions serving persons with disabilities.—Ensures that institutions of higher education that are chartered to serve students with disabilities can benefit from STEM bridge programs and from research partnerships with major research universities funded by NSF. Clarifies that nothing in this section shall be construed to amend or otherwise affect any of the current statutory definitions for minority-serving institutions.

Sec. 245. Institutional integration.—Requires the Director to award grants to colleges and universities for the integration of Foundation funded projects at those institutions in order to increase collaboration across funded projects and expand the impact of such projects.

Sec. 246. Postdoctoral research fellowships.—Requires the Director to establish a Foundation-wide postdoctoral research fellowship program, with priority given to proposals for interdisciplinary research and high-risk, high-reward research.

Sec. 247. Broadening participation training and outreach.—Requires the Director to provide education and training to Foundation staff and review panels on effective tools for increasing participation in STEM by underrepresented groups.

Sec. 248. Transforming undergraduate education in STEM.—Requires the Director to award grants to colleges and universities to reform undergraduate STEM education in their institutions, and specifies that proposals must include evidence of institutional support for, and commitment to, the proposed reform effort.

Sec. 249. 21st Century graduate education.—Requires the Director to award grants to institutions of higher education for the implementation or expansion of reforms in graduate STEM education that emphasize preparation for diverse STEM careers.

Sec. 250. Undergraduate Broadening Participation Program.—Prohibits the Foundation from consolidating the Historically Black Colleges and Universities Undergraduate Program, the Louis Stokes Alliances for Minority Participation program, and the Tribal Colleges and Universities Program into a single program in fiscal year 2011 (as proposed in the agency's budget request). Requires the Director to develop and submit a plan to Congress clarifying the objectives and rationale prior to any consolidation of the programs.

Sec. 251. Grand challenges in education research.—Requires NSF and the Department of Education (ED) to identify, prioritize, and develop strategies to address grand challenges in research and development for pre-K–12 STEM education. Requires NSF and ED to collaborate on a report to Congress outlining the grand challenges, the role of each agency in addressing the challenges, metrics for assessing progress toward meeting the challenges, how the agencies will disseminate the results of the research, and how the agencies will support the implementation of best practices.

Sec. 252. Research experiences for undergraduates.—Requires the Director to award grants to institutions of higher education, nonprofit organizations, or consortia of such institutions and organizations, for sites designated to provide research experiences for 10 or more undergraduate STEM students. Requires that research grant recipients planning to include undergraduate students in carrying out their research request support for the undergraduate students as part of the research proposal itself rather than as a supplement to the research proposal.

Sec. 253. Laboratory Science Pilot Program.—Extends a pilot program at the Foundation to improve laboratory learning at high-needs high schools.

Sec. 254. STEM Industry Internship Program.—Authorizes the Director to award grants to institutions of higher education to establish partnerships with local and regional private sector entities for the purpose of helping undergraduate students connect internship experiences with STEM coursework.

Sec. 255. Tribal Colleges and Universities Program.—Requires the Director to award grants to tribal colleges and universities to enhance STEM education at such institutions and to increase the retention and graduation rates of Native American students pursuing STEM degrees.

TITLE III—STEM EDUCATION

Sec. 301. Coordination of Federal STEM education.—Establishes an interagency committee to coordinate Federal programs and activities in support of STEM education. Requires this committee to develop a STEM education strategic plan to inform program and budget planning for agencies and to establish and maintain an inventory of federally sponsored STEM education activities, including documentation on program assessments. Requires the Director of OSTP to submit an annual report to Congress including a description and level of funding of the STEM education programs and activities of each participating Federal agency for the previous and current fiscal years.

Sec. 302. Advisory Committee on STEM education.—Requires the President to establish an advisory committee on STEM education responsible for soliciting input from a variety of stakeholder groups in order to offer guidance to the President on how to better align Federal programs with the needs of States and school districts, and to improve connectivity between public and private STEM education efforts.

Sec. 303. STEM education at the Department of Energy.—Clarifies the role of the Department in contributing to STEM education, including energy systems science and engineering education, at all levels. Specifies the kinds of STEM education programs and activities that the Department is authorized to carry out. Requires the Secretary to appoint or designate a Director of STEM education with responsibility to oversee and coordinate all STEM education programs and activities across the Department. Requires the Director to develop, implement, and update a STEM education strategic plan for the Department, and maintain an online inventory of STEM education programs at the Department. Requires the Secretary to consult and partner with the Department of Education and the National Science Foundation on STEM education activities,

when appropriate. Requires the Secretary to award grants to colleges and universities to develop or expand the energy systems science and engineering education capabilities of the institution and provide support to graduate students pursuing such courses of study.

Sec. 304. Green energy education.—Authorizes the Secretary to contribute funds to NSF’s Integrative Graduate Education and Research Traineeship program to support graduate training in energy research and authorizes the Secretary to contribute funds to NSF for curriculum development activities in the design and construction of high performance buildings.

TITLE IV—NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY

Sec. 401. Short title.—“National Institute of Standards and Technology Authorization Act of 2010”.

Sec. 402. Authorization of appropriations.—Authorizes a total of \$5.628 billion for the National Institute of Standards and Technology (NIST) for FY 2011 through FY 2015. The total consists of authorization levels of \$1.012 billion in FY 2011, \$1.035 billion in FY 2012, \$1.137 billion in FY 2013, \$1.188 billion in FY 2014, and \$1.256 billion in FY 2015.

Includes within the total authorization a total of \$3.495 billion for NIST labs for FY 2011 through FY 2015. The total for NIST labs consists of authorization levels of \$620.0 million in FY 2011, \$657.2 million in FY 2012, \$696.7 million in FY 2013, \$738.5 million in FY 2014, and \$782.8 million in FY 2015.

Includes within the total authorization a total of \$589 million for construction and maintenance of facilities for FY 2011 through FY 2015. The total for construction and maintenance consists of authorization levels of \$125 million for FY 2011, \$85 million for FY 2012, \$122 million for FY 2013, \$124 million for FY 2014, and \$133 million for FY 2015.

Includes within the total authorization \$1.545 billion for industrial technology services for FY 2011 through FY 2015, which includes a total of \$681 million for the Technology Innovation Program (TIP), a total of \$811.2 million for the Manufacturing Extension Partnership (MEP) program, and a total of \$53.1 million for the Malcolm Baldrige National Quality Award program. The total for TIP consists of authorization levels of \$116 million for FY 2011, \$132 million for FY 2012, \$147 million for FY 2013, \$142 million for FY 2014, and \$144 million for FY 2015. The total for MEP consists of authorization levels of \$141.1 million for FY 2011, \$150.9 million for FY 2012, \$161.5 million for FY 2013, \$172.8 million for FY 2014, and \$184.9 million for FY 2015. The total for the Malcolm Baldrige National Quality Award program includes authorization levels for \$10 million for FY 2011, \$10.3 million for FY 2012, \$10.6 million for FY 2013, \$10.9 million for FY 2014, and \$11.3 million for FY 2015.

Sec. 403. Under Secretary of Commerce for Standards and Technology.—Creates the position of the Under Secretary of Commerce for Standards and Technology. The current Director of NIST would become the Under Secretary until a successor is appointed. (This is the same structure as at the National Oceanic and Atmospheric Administration (NOAA))

Sec. 404. Reorganization of NIST laboratories.—Organizes the NIST laboratories into the following operational units: the Physical Measurement Lab, the Information Technology Lab, the Engineering Lab, the Material Measurement Lab, the Center for Nanoscale Science and Technology, and the NIST Center for Neutron Research. Allows the Director to make future changes to the NIST laboratory structure, provided he submit a report to Congress before implementing such change.

Sec. 405. Federal Government standards and conformity assessment coordination.—Assigns the Director of NIST the responsibility of convening federal departments and agencies to coordinate Federal Government policy goals and engagement on international technical standards and conformity assessment-related activities, working with industry and standards development organizations. Requires the Director to submit a report to Congress which addresses current and anticipated international standards issues with the potential to impact U.S. competitiveness and innovation capabilities, actions taken by the Federal Government to address these issues, and any action the Director is taking, or will take, to ensure effective Federal Government engagement on technical standards and conformity assessment-related issues.

Sec. 406. Manufacturing extension partnership.—Requires MEP Centers to inform local and regional community colleges of the skill sets local manufacturers need in their workplace; creates an innovative services initiative to assist small and medium-sized manufacturers to reduce their energy usage and environmental waste and to accelerate the domestic commercialization of new product technologies (including components of renewable energy systems); requires centers perform market analysis to ensure there is market demand for these new product technologies; requires NIST to assess its administration of the MEP program using the criteria of the Malcolm Baldrige National Quality Award; reduces the required cost share of all MEP Centers for fiscal years 2011 through 2015 and requires a report from the Under Secretary four years after enactment, with his recommendations on cost-share provisions; and exempts the MEP Advisory Board from Section 14 of the Federal Advisory Committee Act (FACA), ‘Termination of advisory committees; renewal; continuation.’

Sec. 407. Bioscience Research Program.—Establishes a Bioscience Research Program at NIST to support the development of standard reference materials and measurements to advance biologic drug research and development, molecular diagnostics, medical imaging technology, and personalized medicine; requires that at least one fellow from the postdoctoral fellowship program be assigned to the bioscience research program; allows the Director to establish University Research Centers through a competitive application process to conduct research that furthers the objectives of the bioscience research program; allows the Director to establish a user facility for industry, institutions of higher education, nonprofit organizations, and government agencies in order to perform research and testing, and provide access to advanced or unique equipment, services, materials, and other resources; requires the Director to include the bioscience research program in the programmatic planning document transmitted to Congress.

Changes the number of NIST's Visiting Committee on Advanced Technology members to vary between 15 and 20 and requires at least 13 of those members to be from U.S. industry.

Sec. 408. Emergency Communication and Tracking Technologies Research Initiative.—Requires the Director to establish an initiative to support the development of technical standards and conformance architecture to improve the operation and reliability of emergency communication and tracking technologies used in confined spaces, such as underground mines, and shielded environments, such as high-rise buildings and collapsed structures; requires the Director, as part of this initiative, to perform an assessment of the measurement, technical standards, and conformity assessment needs for these types of technologies and to submit a report on this needs assessment to Congress 18 months after enactment.

Sec. 409. TIP Advisory Board.—Exempts the TIP Advisory Board from Section 14 of FACA.

Sec. 410. Underrepresented minorities.—Requires the Director to give consideration to the goal of promoting underrepresented minorities in evaluating applications for NIST fellowships for university students and post-doctoral researchers; requires the Director to give special consideration for applications received from teachers at high-needs schools for the NIST teacher science and technology enhancement program.

Sec. 411. Cybersecurity standards and guidelines.—Clarifies that the use of cybersecurity standards and guidelines developed by NIST for industry and public would not be mandatory.

Sec. 412. Definitions.—Defines the terms 'Director' and 'Federal Agency.'

TITLE V—INNOVATION

Sec. 501. Office of Innovation and Entrepreneurship.—Requires the Secretary of Commerce to establish an Office of Innovation and Entrepreneurship to foster innovation and the commercialization of new technologies, products, processes, and services; specifies the duties to be carried out by the Office; establishes an Advisory Council on Innovation and Entrepreneurship to provide advice to the Secretary.

Sec. 502. Federal loan guarantees for innovative technologies in manufacturing.—Requires the Secretary of Commerce to establish a program to provide loan guarantees to small- and medium-sized manufacturers; defines eligible projects as projects to reequip, expand, or establish manufacturing facilities in the United States to use an innovative technology or an innovative process in manufacturing, or to manufacture an innovative technology product or an integral component of such product. Limits the amount of a loan guarantee to an amount equal to 80 percent of the loan; sets out specific limitations on the authority to make loan guarantees; lays out requirements and limitations in the case of default; permits the Secretary to pay principal and interest to lenders or other holders of the loan in specified circumstances; sets out terms and conditions for loan guarantees and requires that the Secretary consult with the Secretary of the Treasury in establishing terms and conditions for loan guarantees.

Requires the Secretary to charge and collect fees for loan guarantees; mandates that borrowers, lenders, and other appropriate parties keep pertinent records and documents to facilitate an effective audit; provides for the full faith and credit of the United States for the payment of loan guarantees; requires the Secretary to issue final regulations before making any loan guarantees and specifies specific items that must be included in the final regulations.

Requires the Secretary to enter into an arrangement with an independent auditor for annual evaluations of the program and requires the Comptroller General to conduct an annual review of the Secretary's execution of the program; mandates a report to Congress containing a summary of all activities carried out under the program.

Requires that the Secretary ensure that activities carried out under the program are coordinated with, and do not duplicate the efforts of, other loan guarantee programs within the Federal Government.

Authorizes the Secretary to use centers established under Manufacturing Extension Partnership (MEP) program to provide information about the program and to conduct outreach to potential borrowers.

Requires the Secretary to promulgate regulations and policies to carry out the program in accordance with Office of Management and Budget Circular No. A-129.

States that it is the Sense of Congress that no loan guarantee shall be made unless the borrower agrees to use a federally-approved electronic employment eligibility verifications system to verify the employment eligibility of persons hired during the contract term by the borrower to perform employment duties within the U.S. and persons assigned by the borrower to perform work within the United States on the project.

Defines "cost", "innovative process", "innovative technology", "loan guarantee", "obligation", and "program".

Provides an authorization of \$50 million for each of Fiscal Year 2011 through Fiscal year 2015 for the cost of loan guarantees; provides an authorization of such sums as are necessary for the Secretary to make payments of principal and interest under subsection (g).

Sec. 503. Regional Innovation Program.—Requires the Secretary of Commerce to establish a regional innovation program to encourage and support the development of regional innovation strategies, including regional innovation clusters. Authorizes the Secretary to award grants on a competitive basis to States, tribes, local governments, nonprofit organizations, institutions of higher education, public-private partnerships, or economic development organizations for activities relating to the formation and development of regional innovation clusters; specifies activities for which grants may be used; defines eligible recipient; establishes requirements for grant applications; limits the amount of any project that the Secretary can provide to 50 percent; requires that the Secretary ensure that activities funded use and apply research, best practices, and metrics developed under the innovation research and information program.

Establishes a regional innovation research and information program; specifies the activities of the research and information pro-

gram; permits the Secretary to award research grants to support and further the goals of the program; requires that the Secretary make data and analysis compiled under the research and information program available to other Federal agencies, State and local governments, and nonprofit and for-profit entities; requires that the Secretary incorporate data and analysis relating to any regional innovation cluster supported by a grant under subsection (b) into the research and information program.

Requires that the Secretary ensure that activities are coordinated with, and do not duplicate the efforts of, other programs at the Department of Commerce and other Federal agencies; requires the Secretary to explore and pursue ways to collaborate with other Federal agencies, including through multiagency funding opportunities, on regional innovation strategies.

Requires that the Secretary, within 4 years of enactment, enter into a contract with an independent entity, such as the National Academy of Sciences, to conduct an evaluation of the program, including a recommendation as to whether the program should be continued or terminated.

Defines “regional innovation cluster”

Authorizes such sums as are necessary for each of fiscal years 2011 through 2015 to carry out the program.

TITLE VI—DEPARTMENT OF ENERGY

Subtitle A—Office of Science

Sec. 601. Short Title.—“DOE Office of Science Authorization Act of 2010”

Sec. 602. Definitions.—Defines “Department”, “Director”, “Office of Science”, and “Secretary”

Sec. 603. Office of Science Activities.—Codifies the mission and duties of the Office of Science, and directs the Secretary of Energy to carry out research activities in science supporting the missions of the Department, including programs on basic energy sciences, biological and environmental research, advanced scientific computing research, fusion energy sciences, high energy physics, and nuclear physics.

Instructs the Department’s Under Secretary for Science to ensure the coordination with the other activities of the Department, and support joint activities among the Department’s programs.

Sec. 604.—Basic Energy Sciences Program.—Directs the Director of the Office of Science to carry out a program in basic energy sciences, including materials sciences and engineering, chemical sciences, biosciences, and geosciences, for the purpose of providing the scientific foundations for new energy technologies. As part of this program, the Director is instructed to support: construction and operation of the program’s major user facilities; competitively awarded energy frontier research centers; and relevant accelerator research and development activities, in coordination with the Office of Science’s High Energy Physics and Nuclear Physics programs.

Sec. 605. Biological and Environmental Research Program.—Authorizes a program of research, development, and demonstration in the areas of biological systems science and climate and environmental science.

The biological systems science research includes activities to: establish a virtual systems biology information framework; support research on computational biology; continue the research of the bio-energy research centers, and expand them to include biobased products; and direct the program to develop a synthetic biology plan.

The climate and environment science research includes activities to: support the research and coordination of the ecosystem observation AmeriFlux Network; develop a next-generation ecosystem-climate change experiment; continue research in regional and global climate modeling; support integrated assessment research.

Sec. 606. Advanced Scientific Computing Research Program.—Directs the Director to carry out a research, development, demonstration, and commercial application program to advance computational and networking capabilities to analyze, model, simulate, and predict complex phenomena relevant to the development of new energy technologies and the competitiveness of the United States.

Instructs the Secretary to produce a plan to integrate and leverage the expertise and capabilities of the program, as well as other relevant computational programs and resources supported by the Federal Government, to advance the missions of the Department's applied energy and energy efficiency programs.

Instructs the Secretary to, at least 18 months prior to the initiation of construction or installation of any exascale-class computing facility, produce a plan detailing the proposed facility's cost projections and capabilities to significantly accelerate the development of new energy technologies.

Authorizes research and development activities in applied mathematics, high-end computing software development, and next-generation computing architectures and platforms to support the missions of the Department.

Sec. 607. Fusion Energy Research Program.—Directs the Director to carry out a fusion energy sciences research and enabling technology development program on the scientific and engineering challenges to building a cost-competitive fusion power plant and a fusion power industry in the United States.

As part of this program, the Director is instructed to: coordinate and carry out the responsibilities of the United States with respect to the ITER international fusion project; produce a 10-year prioritization plan; support fusion materials research and development activities in coordination with the Assistant Secretary for Nuclear Energy; carry out a computational project to advance the capability of fusion researchers to accurately simulate an entire fusion energy system, in collaboration with the Advanced Scientific Computing Research program.

In addition, the Secretary is instructed to establish a research and technology development program in inertial fusion for energy applications.

Sec. 608. High Energy Physics Program.—Directs the Director to carry out a research program on the elementary constituents of matter and energy and the nature of space and time.

As part of this program, the Director is instructed to support research in the nature of the neutrino, dark energy, and dark matter.

The Director is also instructed to carry out research and development in advanced accelerator concepts and technologies to reduce

the necessary scope and cost for the next generation of particle accelerators.

Sec. 609. Nuclear Physics Program.—Directs the Director to carry out a research program, and support relevant facilities, to discover and understand various forms of nuclear matter.

Director is also instructed to carry out a program for the production of isotopes, including the development of techniques to produce isotopes, for research applications.

Sec. 610. Science Laboratories Infrastructure Program.—Directs the Director to carry out a program to improve the safety, efficiency, and mission readiness of infrastructure at Office of Science laboratories.

Sets the minor construction threshold at Office of Science laboratories at \$10 million, to be adjusted by the Secretary in accordance with the Engineering News-Record Construction Cost Index, or an appropriate alternative index as determined by the Secretary, once every five years after the date of enactment of this Act.

Sec. 611. Authorization of appropriations.— Authorizes to be appropriated to the Secretary of Energy for the activities of the Office of Science: \$5,247,000,000 for FY 2011; \$5,614,000,000 for FY 2012; \$6,007,000,000 for FY 2013; \$6,428,000,000 for FY 2014; and \$6,878,000,000 for FY 2015.

Subtitle B—Advanced Research Projects Agency—Energy

Sec. 621. Short title.—ARPA–E Reauthorization Act of 2010.

Sec. 622. ARPA–E amendments.—Amends section 5012 of the America COMPETES Act of 2007 through the following:

(1) In Goals: Adds provisions to clarify that ARPA–E will achieve its goals through both fundamental “and applied” science, and through “promoting the commercial application of advanced energy technologies”.

(2) In Responsibilities of the Director: Emphasizes that the R&D on manufacturing processes and technologies should be for the domestic manufacturing of novel energy technologies.

(3) In Responsibilities of the Director: Inserts provision to specify that the Director will require applicants to disclose prior efforts and investments in their technology, adopt measures to ensure that ARPA–E funds projects in areas not likely to be undertaken by industry alone, and report on instances where funding augments efforts undertaken by industry.

(4) Re-designates subsections (f) as (g), and reorders all subsections thereafter

(5) Inserts new subsection “(f) AWARDS” to clarify that the Director of ARPA–E has the authority to initiate and execute the full range of award instruments of the Department, including grants, contracts, cooperative agreements, cash prizes and other transactions. “Other Transactions Authority” is a flexible contracting authority granted to the Department in Section 1007 of the Energy Policy Act (EPA) of 2005.

(6) In Personnel: Inserts new paragraph (1) requiring the Director to maintain a staff of qualified and experienced personnel to serve within ARPA–E.

Makes changes to clarify that program managers (program directors) can direct more than one program, and that program managers (program directors) are not required to seek the advice of ad-

visory committees or scientific organizations in making award selections. Adds to the list of program manager (program director) responsibilities identifying cost-sharing opportunities for projects, including through possible exercising of waiver authority by the Secretary under Section 988 of EAct 2005; and identifying ways to transfer successful energy technology projects to the marketplace.

Clarifies that the term of a program manager (program director) may be “up to” 3 years. Replaces term “program manager” with “program director” to align with current practices of ARPA-E.

Strikes requirement that ARPA-E maintain a staff of 70–120 employees. Authorizes the Director to select exceptional scientific, legal, business, and technical personnel to serve as limited terms as Fellows.

(7) In Reports and Roadmaps: Shifts deadlines for the Strategic Vision Roadmap from 2008 and 2011, to 2010 and 2013, respectively.

(8) In Federal Demonstration of Technologies: Strengthens existing language to require Director to actively seek opportunities to demonstrate ARPA-E technologies through procurement by DOE and other federal agencies.

(9) Inserts new subsection “(k) Events” authorizing the Director to convene events for the purposes of allowing ARPA-E project awardees and finalist to demonstrate technologies to a range of stakeholders, and for other purposes as determined by the Director. Specifies that funding for events will be provided from funds used for technology transfer and outreach.

(10) In ARPA-E Evaluation: Changes from “4 years” to “6 years” the time after establishment at which the National Academies will evaluate the performance of ARPA-E.

(11) In ARPA-E Evaluation: Adds a requirement that the lessons learned in the National Academies evaluation of ARPA-E shall consider how such lessons may apply to other programs within DOE.

(12) In Funding: Extends Authorization of Appropriations for Fiscal Years 2011 through 2015:

- (A) \$300,000,000 for fiscal year 2011
- (B) \$450,000,000 for fiscal year 2012
- (C) \$600,000,000 for fiscal year 2013
- (D) \$800,000,000 for fiscal year 2014
- (E) \$1,000,000,000 for fiscal year 2015

(13) In Funding: Strikes Limitation which made fiscal year 2008 funding for ARPA-E contingent upon the Office of Science receiving an increase from 2007.

(14) In Funding: Increases the amount of funds that shall be used for technology transfer and outreach activities from 2.5 percent to 5 percent of total appropriated funds, consistent with the program’s goals of advancing technologies to commercial application.

Subtitle C—Energy Innovation Hubs

Sec 631. Short title.—Energy Innovation Hubs Authorization Act of 2010.

Sec. 632.—Energy innovation hubs.—(a) ESTABLISHMENT OF PROGRAM.—Directs the Secretary to carry out a program to create Energy Innovation Hubs that will conduct and support re-

search, development, demonstration and commercial application of advanced energy technologies. Where practicable these activities should occur in a central location. Each Hub created shall be focused on a particular unique advanced energy technology. The Secretary will ensure that the program is coordinated with other DOE research entities so as to avoid duplication and shall convene representatives from the Hubs, DOE, and any other relevant entities the Secretary find appropriate. The Secretary shall also administer each Hub through a DOE program with relevant jurisdiction based on a Hub's technology focus.

(b) Consortia.—Outlines the requirements that must be met by an applicant consortium in order to be eligible to form a Hub. A consortium must be made up of at least two qualifying entities who have created a binding agreement documenting the partnership agreement, measures to ensure cost-effective implementation, a proposed budget, conflict of interest procedures, an accounting structure, and an external advisory committee. The application made by the consortium to the Secretary will be made by one of the consortium's members as a prime applicant. The application shall describe the consortium agreement and, in the event consortium members will not be in a centralized location shall include a communications plan to ensure integration of the Hub's activities.

(c) Selection and schedule.—Establishes the process by which the Secretary shall review all consortium applications received. The Secretary shall review all Hub applications received, and consortia grants will be approved through a competitive process. Any grant made to a Hub shall be for a period no longer than five years and may be renewed through a competitive process.

(d) Hub operations.—Details that a Hub shall conduct multidisciplinary, collaborative research, development, demonstration, and commercial application of advanced energy technologies. A Hub shall encourage collaboration and communication and, whenever practicable, conduct its activities at one centralized location. In order to provide greater transparency, the Hub shall develop and publish on DOE's website all proposed plans and programs. In addition to a general duty to monitor project implementation and coordination, the Hub shall submit an annual report to the Secretary that summarizes all activities and projects, expenditures, and external advisory committee members.

The external advisory committee each Hub is required to establish under this section will advise Hub management on programs and planned activities, but shall not have decision making authority. The advisory committee membership should have sufficient expertise to provide guidance on scientific, technical, financial, and research management matters. This section also requires each Hub to establish procedures to address conflicts of interest, consistent with those already established by DOE. The Secretary may disqualify an application or revoke funds if a failure to disclose any conflict of interest is discovered.

(e) Prohibition on construction.—Prohibits any funds granted by the Secretary to a Hub to be used for construction of a new building or facility for Hub activities. Furthermore, construction of new buildings or facilities shall not be considered as part of the non-Federal share of a Hub cost-sharing agreement. Excluded from this prohibition are any buildings or facilities constructed to serve as a

test bed or any renovations to existing buildings or facilities so long as the test bed or renovations are limited to the scope and scale of the research.

(f) Oversight board.—Requires the Secretary to establish within the Department an Oversight Board to monitor the Hubs and their activities.

(g) Priority consideration.—Requires the Secretary to establish within the Department an Oversight Board to monitor the Hubs and their activities.

(h) Definitions.—Provides the definitions for terms used within the bill, including: Advanced Energy Technology, Hub, Institution of Higher Education, Qualifying Entity, and Secretary.

(i) Authorization of Appropriations.—Provides authorizations for each of the fiscal years 2011 through 2015 as follows:

- (1) \$110,000,000 for fiscal year 2011;
- (2) \$135,000,000 for fiscal year 2012;
- (3) \$195,000,000 for fiscal year 2013;
- (4) \$210,000,000 for fiscal year 2014; and
- (5) \$210,000,000 for fiscal year 2015.

SUBTITLE D—COOPERATIVE RESEARCH AND DEVELOPMENT FUND

Section 641. Short title.—subtitle is cited as the “Cooperative Research and Development Fund Authorization Act of 2010”.

Section 642. Cooperative Research and Development Fund.—Directs the Secretary of Energy to make funds available to National Laboratories to pay the federal share of cooperative research and development agreements (CRADA’s). Provides for special consideration of small business in CRADA’s. Directs the Secretary to report annually how funds were expended. Authorizes such sums as are necessary to carry out the subtitle.

TITLE VII—MISCELLANEOUS

Sec. 701. Sense of Congress.—States that it is the Sense of Congress that programs and activities authorized in the bill that correspond to the recommendations of the National Academy of Sciences’ 2005 report entitle “Rising Above the Gathering Storm” remain critical to maintaining long-term United States economic competitiveness and shall receive priority funding.

Sec. 702. Persons with disabilities.—Requires that, for purposes of the activities and programs supported by the bill, institutions of higher education chartered to serve large numbers of students with disabilities and those with programs serving or those serving disabled veterans receive special consideration and have a designation consistent with the designation for other institutions that serve populations underrepresented in STEM.

Sec. 703. Veterans and service members.—Requires that, in awarding scholarships and fellowships under the bill, an institution of higher education give preference to applications from veterans and service members.

VIII. COMMITTEE VIEWS

TITLE I—SCIENCE AND TECHNOLOGY POLICY

Section 105—Research in areas of national importance

The Committee joins the National Nanotechnology Advisory Panel in applauding the NNI agencies in the development of three signature initiatives in the grand challenge areas of Nanotechnology Applications for Solar Energy, Sustainable Nanomanufacturing, and Nanoelectronics for 2020 and Beyond. The Committee agrees with the NNI agencies that the long-term vision for nanomanufacturing is the creation of complex nanodevices through low cost, high-rate nanomanufacturing processes that use “bottom-up”, self-assembly methodologies. An important component of this vision is the design and synthesis of uniform, robust nanoelements and other nanomaterials.

The Committee also recognizes that the U.S. economy has benefited greatly over the past decades from advances in semiconductor technology, but the ability to scale today’s silicon-based technology is rapidly approaching fundamental limitations. The transition to nanoelectronics will be as significant as the transition from mechanical electrical switches to vacuum tubes, or from single solid state transistors to integrated circuits. Additionally, the Committee recognizes the important role public-private research partnerships have played in addressing technological challenges and highlights the Nanoelectronics Research Initiative as a successful model of government-industry-university collaboration. The Committee encourages Federal science agencies to continue to promote and support collaborative research efforts in nanotechnology.

Section 123—Interagency Public Access Committee

The Committee is concerned about the possibility of Federal agencies working separately to develop disconnected policies related to the dissemination of the results of federally funded research. Not only would such fragmentation put an undue burden on the stakeholder communities that answer to multiple agencies, it would also have unintended consequences with respect to inhibiting, rather than facilitating transformative advances at interdisciplinary interfaces. Therefore, the Committee included this provision to ensure that agencies collaborate on the complex technical and research issues that underlie the development of any public access policies, especially interoperability across agencies, across science and engineering disciplines, and across international borders.

The Committee is pleased with the contributions made by the Scholarly Publishing Roundtable, a group of experts from universities, nonprofit and for profit publishers, and libraries who were convened by the Committee in 2009 to develop broad agreement on recommendations to expand public access to the results of federally funded research. The Members of the Roundtable went on to produce a report, completed in January, 2010, in which the Roundtable presented general principles, analyses, and recommendations concerning public access. Due to the complexity and importance of this issue, the Committee urges the Public Access working group required under this section to give careful consideration to the

Roundtable's report and to develop a balanced process for seeking advice from and collaborating with all parts of the non-Federal stakeholder community as it carries out its responsibilities in coordinating Federal science agency research and policies related to the dissemination and long-term stewardship of the results of unclassified research. Furthermore, the Committee urges each of the Federal science agencies to similarly engage in a meaningful collaboration with stakeholder groups in the development of any agency policies on public access.

TITLE II—NATIONAL SCIENCE FOUNDATION

Section 211—Definition of STEM

For the purposes of Title II of this Act, the term 'STEM' should be understood to be an umbrella term that covers every academic discipline and research area supported across the entire Foundation, including discipline based education research. Where the term 'STEM' is used elsewhere in this Act, it is likewise meant to cover all disciplines supported by the relevant agency, or in the case of the PCAST and NSTC committees established in Title III, STEM should be understood to encompass the entire breadth of Federally supported research areas.

Section 214—Broader impacts review criterion

The Committee understands that the purpose of the broader impacts review criterion, first applied by NSF in the mid-1990's, is to increase the impact of NSF supported research on individual and societal well being. The Committee applauds the National Science Board for having recommended a broader impacts review criterion, and believes it should be applied across more agencies than just NSF. The specific list of goals in subsection (a) was included in a report to Congress by the Foundation in 2008, as requested in the 2007 America COMPETES Act. The Committee chose not to amend that list developed by the Foundation in 2008. However, the Committee understands that this list may and perhaps should evolve over time, and does not intend to preclude the National Science Board from launching a more in-depth, comprehensive review of either the goals or implementation of the Foundation's merit review criteria.

However, the Committee is concerned that this criterion has been in place for more than 10 years now with little effort put toward evaluation of its impact or toward holding anyone, including NSF funded investigators, accountable for their efforts to satisfy the criterion. The Committee understands that these same concerns have been echoed widely by stakeholders, including during NSF hosted workshops on this topic. The Committee believes that if a broader impacts review criterion is to be applied at all, it should be treated with the same rigor as the scientific merit review criterion. The intent of Sec. 214 is ensure such rigor, not by putting more burden on the individual investigators, but by putting more burden on the institutions and other organizations with expertise to assist individual investigators in achieving the goals of the review criterion. The Committee also encourages partnerships among institutions of higher education, and between institutions and other organizations, such as science museums, with expertise and re-

sources to help investigators achieve one or more of the broader impacts goals.

While, to the extent practicable, investigators and institutions should employ evidence-based strategies and models to meet the chosen goal(s) of the broader impact criterion, as described in subsection (b)(2), the Committee does intend to leave room for innovation within the broader impacts portion of a proposal. This is particularly applicable to very large grants, such as Centers grants, and awards such as the CAREER awards that explicitly integrate education and research. Regarding Centers, the Committee has heard concerns that for such large grants, the researchers are too often disconnected from the education/outreach component, which may be overseen by separate staff. The Committee encourages the Foundation and the awardees to put more effort into integrating education and research efforts across all grants.

Section 216—Collection of data on demographics of faculty

The Committee intends for the Foundation, to the extent practicable, to use existing faculty demographic data sources and survey mechanisms utilized by other Federal agencies, including data collected and maintained by the National Center for Education Statistics at the Department of Education. Furthermore, the Committee does not expect institutions of higher education to have to report duplicative faculty demographic data to multiple Federal agencies, but instead expects the Foundation to work cooperatively with appropriate Federal statistical agencies to acquire such data.

Section 224—Strengthening institutional research partnerships

The Committee has been hearing for years that institutions with significantly less research capacity than the major research universities, especially minority serving institutions, are too often added to proposals as an afterthought by the lead university to make the proposal appear stronger with respect to satisfying the broader impacts review criterion. This practice is shortsighted and not in keeping with the purpose of such partnerships or the broader impacts review criterion. The Committee expects that any partnership funded by NSF be a true partnership that engages all players in the development and shaping of the proposal from the beginning. That does not mean the budget or research activities have to be split evenly among partner institutions; it simply means that both the needs and the unique strengths of the secondary institutions should be respected and taken into account in the development of the proposal. While it is not a research partnership, the Committee points to the astronomy bridge program between Fisk University and Vanderbilt University as an example of the kind of mutually beneficial partnership that should be emulated across all NSF funded partnerships.

Section 226—Support for research infrastructure

The range of 24–27 percent cited in this provision is meant to capture the entire breadth of research infrastructure funding at the Foundation, including MREFC, all of the maintenance and operations costs for MREFC projects being supported by the research directorates, cyberinfrastructure, major research instrumentation (MRI), and the several national centers and mid-scale facilities sup-

ported by the Foundation, such as the National Center for Atmospheric Research.

Section 227—Partnerships for innovation

The Committee understands that Partnerships for Innovation is currently undergoing review and likely to be re-envisioned through workshops and other activities that solicit stakeholder input on how to make the program most effective. The committee intends the language included in the bill to be flexible enough to allow the program to evolve, while maintaining key components, such as strong partnerships between and among institutions of higher education and industry, and building the capacity of colleges and universities and their researchers to transfer the knowledge they create into jobs and into improved social and economic well being for their regions and for the Nation. The Committee intends for the term “social enterprise non-profit organizations” to refer to non-profit social entrepreneurial ventures harnessing the power of technology for social benefit, for example a non-profit organization that develops specialized technologies for the disabled.

Section 228—Prize awards

The Committee recognizes that an innovation inducement prize program falls outside the Foundation’s current experience for supporting basic research. However, the Committee believes that such a program is just one more tool to stimulate high-risk research that could potentially lead to transformative advances with far-reaching benefits for society. The Committee established this program as a pilot program to provide the Foundation with the opportunity to learn from the program and report back to Congress before the Administration or Congress decides whether to broaden it to a permanent program within the Foundation. Subject to availability of funds, the Committee expects the Foundation to hold more than one competition under this pilot program, and ideally 3–5 competitions so that the agency gains enough experience to make evidence-based recommendations on whether and how to proceed with such a program in the long term.

The Committee intends the language in subsection (g)(4) to prevent so-called “double-dipping” into Federal funds. In other words, the Committee intends for an eligible researcher to pursue the research specific to the prize topic on his or her own time and without Federal funds. The Committee does recognize the incremental nature of science, and does not intend to exclude from eligibility a researcher who has used Federal funds to contribute to a body of knowledge upon which the prize-winning research is built, provided that he/she has not received a Federal research grant to carry out the specific research for which the prize is being awarded and is not diverting funds from a current Federal grant that was awarded for a related, but different research question. The same shall be true for any undergraduate or graduate student with a current (at the time of the prize announcement) Federal scholarship, fellowship, or research internship to pursue the specific area of research for which the prize is being awarded. A researcher who may have previously received such a scholarship, fellowship or internship in another researcher’s laboratory may be eligible provided the other criteria described here are met.

Section 241—Graduate student support

The Committee chose to tie the growth of the IGERT program to that of the GRF program because our effort to achieve the same goal through provision of separate authorization levels for each program in the 2007 COMPETES Act went unheeded. The IGERT program has been flat-funded for 2 years now, and the Committee is concerned that the Administration will maintain this trend in coming years. The Committee does not intend for either program to cut into the many other valuable programs in the EHR budget, however the Committee continues to support the role of EHR in managing and maintaining budgets for both of these graduate programs.

In subsection (d), the Committee raises the cost of education allowance for graduate fellowships and scholarships from the current level of \$10,500 to \$12,000. However, for any case in which the cost of education at an institution is less than \$12,000, the Committee expects that the difference will be applied toward other allowances under the fellowship, including the stipend and any additional allowance that may be included as a standard allowance for all fellows under the GRF or IGERT programs.

Section 242—Postdoctoral Fellowship in STEM education research

The Committee encourages the Director to award STEM education research fellowships under this section with consideration given to how the research to be supported is coordinated with the broader science education community and contributes to the systematic accumulation of knowledge on STEM education.

Section 243—Robert Noyce Teacher Scholarship program

As it recommended in 2007, the Committee continues to expect that the preponderance of the funds for this program will go directly to participants in the form of scholarships and stipends. But the Committee also understands that a significant percentage of the funds should be used in capacity-building activities, as defined in the 2007 Act. The Committee also understands that the resources needed to initiate a teacher education program may exceed the level needed for steady state operation of the program. The Committee expects that NSF will ensure that resources are allocated under the program to ensure a sufficient investment in capacity-building activities, so that the program does not merely hand out scholarships and stipends but rather reforms the way teachers are educated.

Since requiring the non-Federal matching requirement under Section 10A of Noyce in 2007, the Committee has learned that a number of institutions have provided up to 98 percent of the match with in-kind resources. While the Committee recognizes the need to provide flexibility to institutions in meeting the match, including the reduced match provided for under this Act, the Committee intends for a majority of the non-Federal match to be met in cash, except in the cases of small planning grants funded under this program.

Section 245—Institutional Integration

The language in this section is based on the Foundation's new I³ program, and is consistent with the common theme of institutional

transformation that cuts across this entire Title. While proposals may be focused entirely on integrating large EHR projects at an institution, the Committee also encourages the Foundation to solicit proposals that seek to institutionalize education and broadening participation efforts that may initially be funded through other NSF grants, such as Centers grants and CAREER awards.

Section 248—Transforming Undergraduate Education in STEM

The Committee intends that in cases for which consortia of institutions apply for a grant focused on reform in a single discipline across multiple institutions, and the relevant disciplinary society serves as the convener of the consortia, that society, provided it is otherwise eligible for NSF grants, may serve as the fiscal agent on the grant.

Section 249—21st Century graduate education

The Committee is supportive of NSF's GK-12 program, which provides graduate students in STEM with the opportunity to broaden their skills and translate their science for K-12 students and teachers, and understands that it has received very positive reviews. However, the Committee believes that there are many activities that could strengthen and broaden the graduate student experience and ensure that such students are prepared for diverse careers that utilize their STEM degrees. Therefore, it is the intention of the Committee that over the next few years, the budget for the GK-12 program, and the program itself, be captured by this broader initiative in graduate education.

The Committee recognizes the importance of master's programs to prepare future science professionals for careers in the business, government and non-profit sectors and intends that proposals to implement or expand innovative professional science master's degree programs remain eligible for funding under this section.

Section 250—Undergraduate Broadening Participation program

In Sec. 7033 of the 2007 America COMPETES Act, the Congress authorized a program to enhance the quality of undergraduate STEM education at Hispanic-Serving Institutions (HSIs) and to increase the number of Hispanic students receiving associate's and baccalaureate degrees in STEM, as well as the number of Hispanic students continuing on to pursue graduate studies in STEM. The Committee understands that the Foundation needed time to hold workshops and solicit community input on how to shape such a program to make it most effective for its intended purposes, and is now carrying out a comprehensive review of its entire portfolio of undergraduate broadening participation programs. However, it remains the intention of the Committee that the Foundation award grants that take into account the unique needs and challenges of Hispanic students pursuing STEM studies at those institutions and that allow HSIs to shape the proposals to meet their own institutions' and students' needs in order to achieve the goals of Sec. 7033 of the 2007 Act.

The Committee expects any plan by NSF to realign or consolidate existing undergraduate broadening participation programs to be developed in full consultation and collaboration with all affected communities and institutions.

TITLE III—STEM EDUCATION

Section 303—STEM education at the Department of Energy

The Committee intends for this section to provide guidance to the Department of Energy on the development of a vision and strategy for the role of the Department in contributing to STEM education, including energy sciences and engineering education, at all levels, both to address the Department's own workforce needs, and to contribute more broadly to improving the state of STEM education in the United States. Furthermore, the Committee is concerned about the lack of intra-agency coordination of STEM education activities at the Department. Therefore, the Committee calls for the appointment or designation of a Director of STEM Education, responsible for overseeing and coordinating all activities in support of STEM education at the Department. The Secretary may choose to house this person organizationally within the Office of Science, but the Committee intends for the Director to be given responsibility to advise on and coordinate all STEM education matters and activities across the Department, including those funded by the applied energy technology offices. It is preferable that colleges and universities have a single portal through which to seek information regarding and funding from the Department's education programs. Finally, while the Committee recognizes and supports the need for the applied energy technology offices and their respective National Labs to develop stronger collaborations with universities, the Committee urges the Department to take seriously its proposed partnership with the National Science Foundation in carrying out its education programs at both the K-12 and higher education levels. In particular, the Committee recommends that the Department find a way to partner with the Foundation to co-fund excellent energy-related proposals submitted to the Foundation's Advanced Technological Education program rather than establishing a similar but separate 2-year college program within the Department. Finally, with respect to the \$55 million in new energy education funding proposed in the Department's FY 2011 budget request, the Committee recommends that the preponderance of funding under that proposal go toward the higher education activities described in this section.

TITLE IV—NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY

Section 403—Under Secretary of Commerce for Standards and Technology

By elevating the Director of NIST to the level of an Under Secretary, the Committee anticipates and expects that NIST will play a more active role in federal innovation and standards policy, in keeping with NIST's mission and role as outlined by Congress in its original 1901 statute. This is particularly true in areas where the development and maintenance of technical standards support a national need and policy, such as in electronic health care records, smart grid, electronic voting equipment, the World Trade Center collapse investigation, and cybersecurity. In the past, NIST has been reticent to fully engage in its original mission. The Committee strongly supported the elevation of Dr. Patrick Gallagher to become

the 14th NIST Director due to the sense of leadership and vision he has already brought to NIST. It is our intent to fully support Dr. Gallagher in his endeavors to reinvigorate NIST to meet its original Congressional mandate. As a measure of our confidence, we felt that by elevating the NIST Director to an Under Secretary level, NIST would have a greater voice and impact in Administration deliberations.

Section 404—Reorganization of NIST laboratories

The Committee endorses the Administration's concept of a more multidisciplinary and streamlined laboratory structure at NIST. The Committee expects the structure to result in more efficient operations and a more proactive and responsive approach to industry measurement needs. The current laboratory structure and mission statements are more than twenty years old and the basic tenant of Moore's law would conclude that such structure is sadly out of date. The Committee expects NIST to quickly implement the proposed lab organization. In addition, the Committee is well aware that technology innovation is not static and certainly not on twenty-year cycles. The Committee encourages critical self-examination by NIST to ensure its activities and structure meet current and near-term technical needs of industry.

Section 405—Federal Government standards and conformity assessment coordination

The Committee has long been aware of the often confused and conflicting response by the U.S. Government to international technical standards issues dating back to a set of oversight hearings the Committee initiated in the mid-nineties. The Administration has also recognized this problem in its recent *Cyberspace Policy Review*, in which one of the recommendations was the need for a single locus in the Federal Government to formulate U.S. Government policy related to international cybersecurity technical standards. The Committee expects NIST to take a much more central and active role within the Federal Government and in coordination with appropriate private sector entities in developing a coordinated U.S. Government approach to international standards issues. The Committee does not want to see repetitions of the confused U.S. Government response as occurred in the Wireless Local Area Network (WLAN) Authentication Privacy Infrastructure (WAPI) and international biofuel standards issues. In the current global competitive environment, we need a proactive U.S. Government approach.

Section 406—Manufacturing extension partnership

The Committee expects the MEP program to increase its ties to community colleges by giving the colleges the information necessary to produce students with the technical skills sets required by local and regional small and medium-sized enterprises (SMEs). This is an important component in improving the competitiveness of SMEs and the employment opportunities of the American workforce. American SMEs are facing unprecedented global economic challenges; SMEs provide good high paying jobs to a significant portion of the American workforce. It is imperative that Congress do everything possible to ensure American SMEs can rise to these challenges. Therefore the Committee expects MEP to implement

the Innovative Services Initiative immediately and forcefully. In addition, MEP must establish performance metrics and a monitoring regime to ensure this initiative is effective and that taxpayers' dollars are being spent to their benefit.

The change in the MEP Center cost share immediately addresses the funding issues resulting from a lack of state revenue and the difficulty and appropriateness of a fee-based service for SMEs in the current economic climate. The Secretary needs to implement the revised cost-share provisions beginning in Fiscal Year 2011. MEP is based on the concept of a partnership between the Federal Government, state governments, and the SME community. In the current economic climate, the Federal Government needs to be an active and supportive element of this partnership. The Committee expects the recommendations contained in the Secretary's required report will inform future decisions concerning the long-term sustainability of MEP Centers.

Section 407—Bioscience Research Program

During the past several budget cycles, NIST has announced a new initiative in the biosciences. This Committee has strongly supported these initiatives and Congress has always provided the requested funding. It is with regret that the Committee notes that NIST has done little to implement these past proposed initiatives. Both the FDA and industry have exhorted NIST to develop a more vigorous measurement science program to support growth in the fields of biologics and personalized medicine. The Committee believes it is necessary to more actively engage NIST's attention to these burgeoning fields which have the potential to revolutionize disease treatment. It is time for NIST to move forward with this issue. The Committee expects NIST to develop a comprehensive and industry-responsive measurement program in this field. The Committee will continue close oversight of NIST's activities.

The Committee charges the VCAT with reviewing the Bioscience Research Program in its Programmatic Planning document. The Committee has expanded the VCAT membership to between fifteen and twenty in order to meet this new responsibility. The Committee expects the NIST Director to select additional VCAT members with the appropriate bioscience expertise to guide Congress in the success and utility of NIST's efforts in this field. The Committee expects the Bioscience Research Program section of the programmatic planning document be developed in close consultation with industry and the appropriate federal agencies, such as the FDA and NIH, to ensure that the Program meets the metrology needs of industry and does not duplicate, but rather complements, similar programs at other federal agencies.

When establishing university research centers as a component of the Bioscience Research Program, the Committee expects the Director to give due consideration to all applications. The Committee has held many hearings on the need to encourage participation of minority serving institutions in R&D and science, technology, engineering, and mathematics (STEM) activities of the U.S. Government. The Committee would encourage NIST to expand and strengthen its outreach activities to all institutions of higher education not forgetting the role that Predominantly Black Institu-

tions, Tribal Colleges and Universities, and Hispanic-serving institutions play in the U.S. science and technology enterprise.

TITLE V—INNOVATION

Section 502—Federal loan guarantees for innovative technologies in manufacturing

The Committee believes that the loan guarantee program for innovative technologies in manufacturing will provide small- and medium-sized manufacturers access to the capital needed to retool to remain globally competitive. The Committee expects that the loan guarantee program will also serve an important function in helping to transfer promising new manufacturing technologies and processes, including those developed through federally-supported research and development, into manufacturing facilities throughout the United States. In addition, the Committee anticipates that the program will help in the commercialization of new technologies and products dependent on a solid manufacturing base.

The Committee intends for loan guarantees under the program to be made only in conjunction with loans to small and medium-sized manufacturers. Although the Committee has not defined small and medium-sized manufacturers, it has charged the Secretary of Commerce with determining the criteria that will be used to determine whether a borrower is a small and medium-sized manufacturer and including the criteria in the final regulations that must be published before any loan guarantee can be made. The Committee expects that the Secretary will review the criteria that other Federal Government programs use in determining whether a business is small or medium-sized and use similar criteria, if appropriate, for purposes of this loan guarantee program. In addition, the Committee believes that the Manufacturing Extension Partnership program at the National Institute of Standards and Technology may be a useful resource to the Secretary in developing the criteria and for conducting outreach to potential borrowers.

The Committee recognizes that there are other loan guarantee programs at other Federal agencies, including the Small Business Administration and the Department of Energy, and that—in some cases—small and medium-sized manufacturers may be eligible for loan guarantees under these other programs. The Committee is not interested in creating duplicative programs and, therefore, has specifically required that the Secretary ensure that the activities carried out under this loan guarantee program are coordinated with, and do not duplicate the efforts of, other loan guarantee programs within the Federal Government.

Section 503—Regional Innovation Program

The Committee believes that regional innovation clusters have significant potential for spurring innovation in the United States and that the Federal Government can play an important role in helping to empower local communities to develop regional innovation clusters.

Although the Committee recognizes that regional innovation clusters may be focused on a wide variety of areas and industries, the Committee's interest in regional innovation clusters is based on

its commitment to promoting technological innovation. The Committee expects that, in carrying out this program, the Secretary will focus the program on regional innovation clusters centered on technological innovation.

The bill includes examples of the types of activities the Committee feels are appropriate for Federal Government support under the grant program. This includes supporting local communities that are seeking to develop new regional innovation clusters through activities such as inventorying local assets that may provide the foundation for a successful cluster, conducting feasibility studies, and carrying out planning activities. It also includes supporting efforts by participants in early stage regional innovation clusters to develop and strengthen the connections that are recognized as being critical to successful innovation clusters and to attract other participants to the cluster, particularly those that may meet needs not met by existing cluster participants.

The Committee believes that the success and long-term viability of a regional innovation cluster is unlikely to be achieved without the support and commitment of a wide range of stakeholders. For that reason, the Committee expects that the Secretary will provide grant support only to those clusters that are strongly supported by State and local governments, the private sector, and other relevant stakeholders.

The Committee feels strongly that innovation and the development of marketable products and technologies is the goal of regional innovation clusters. To this end, the bill requires that applicants include in their applications the extent to which the regional innovation cluster is likely to stimulate innovation, and expects that the Secretary will provide funding only to those projects that the Secretary believes are likely to stimulate innovation. In addition, the Committee feels that it is appropriate for the Secretary to fund efforts by regional innovation cluster participants to push new technologies and products into the market, which may be facilitated through demonstration, technology transfer, and commercialization activities.

The Committee fully expects the grant program and the research and information program to complement each other. The Committee intends that the information and data gathered from regional innovation clusters supported by grants will be incorporated into the research and information program, and that the research and best practices developed through the research and information program be utilized by participants of regional innovation clusters supported by grants.

The Committee recognizes that several different agencies have funded, or are interested in funding, regional innovation cluster activities. The Committee expects that the Secretary of Commerce will make every effort to ensure that this program is coordinated with, and does not duplicate the efforts of, any programs at other Federal agencies.

TITLE VI—DEPARTMENT OF ENERGY

Subtitle A—Office of Science

In 1977, after decades of historic and nationally significant Federal support for basic research and scientific discovery, what is now

known as the Office of Science within the Department of Energy was formally established.

Today it is the single largest supporter of basic research in the physical sciences in the United States, providing more than 40 percent of total funding for this vital area of national importance.

In section 603, the Committee seeks to institutionalize and guide the scope of these activities through codification of the Office's mission and duties, calling particular attention to the Office's long-standing role in support of science for discovery and for national need as well as national scientific user facilities.

Recognizing that the Office does and should continue to support a broad range of S&T activities, from basic and applied research to technology development, demonstration, and commercial application, it is the Committee's expectation that basic research should remain a strong focus of these activities, and that the Office should continue to strengthen coordination and collaboration with the Department's applied research and development programs to accelerate the advancement of new energy technologies.

The Committee believes that the user facilities which the Office of Science builds, operates, and maintains are a major asset to the research infrastructure and overall competitiveness of the United States. The Committee also recognizes the Office's strong project management record, particularly relative to the rest of the Department. As such, and consistent with the recommendations of the report of the U.S. Government Accountability Office, GAO-08-641, the Committee recommends that DOE: (1) consider adopting department-wide selected practices from the Office of Science's independent project review process and (2) review and strengthen, as appropriate, DOE's department-wide project management guidance to ensure that each project's technical goals are clearly defined.

Given the sizable U.S. taxpayer investment in the construction of these facilities, the Committee recommends full practicable operation and utilization of each facility following achievement of Critical Decision 4 (CD-4), or approval of the start of operations, the final major step in the Office of Science's standard project management practices. The Committee recognizes that facility operation budgets are often the least difficult to cut in order to support other Office of Science initiatives. However, the Office should always carefully weigh the relatively small cost and high benefit to U.S. competitiveness of additional facility operation time and support against other potential uses of limited research dollars.

As part of the Department's efforts to contribute to the nation's overall competitiveness, the Committee encourages the Secretary to develop a clear policy on how to best accommodate the research needs of non-proprietary industrial users of Office of Science facilities. These are users that have no need to patent or hide what they learn, and so paying the standard full cost recovery rate to retain all intellectual property rights can be an unnecessarily high barrier for them. Yet because of the nature of their work, such as incremental product development, these users also would not necessarily win time on the facility based on scientific merit, which is how the remainder of facility runtime is typically allocated. To meet these users' needs, the Committee encourages consideration of the potential to benefit U.S. economic competitiveness as a criterion for allocating non-proprietary runtime.

The Committee encourages the Secretary of Energy to strengthen the role and authorities of the Under Secretary for Science to coordinate and direct energy technology research, development, and demonstration activities across the Department, consistent with the Energy Policy Act of 2005.

The Committee commends the Office of Science's Basic Energy Sciences Program (BES) for its comprehensive strategic planning activities over the past decade to better identify and address research areas with the potential to achieve significant breakthroughs in the development of new energy technologies. The Committee finds that the Energy Frontier Research Centers are a clear extension of these strategic planning efforts, and approves of the Department's policy that: (1) none of these Centers are permanent; (2) no federal funding can pay for new buildings or facilities to house a Center; (3) they must each recompete after a 5 year period or be terminated; and (4) any multi-institutional collaboration is eligible to compete.

The Committee believes that while the High Energy Physics Program may be designated the lead for the entire Office of Science in accelerator research and development overall, BES should take the lead in developing new enabling technologies for the next generation of light and neutron source facilities. As recommended in the Basic Energy Sciences Advisory Committee's May 2009 report on Next-Generation Photon Sources for Grand Challenges in Science and Energy, the Committee encourages the Department to develop a rigorous research and development program into photon sources that may explore "the temporal evolution of electrons, spins, atoms, and chemical reactions, down to the femtosecond timescale," and ". . . spectroscopic and structural imaging of nano-objects (or nanoscale regions of inhomogeneous materials) with nanometer spatial resolution and ultimate spectral resolution." These advances may enable significant breakthroughs in advanced energy technologies, health care solutions, materials development, and information technologies.

The Committee notes that while the Office of Science manages a significant Advanced Scientific Computing Research Program (ASCR) to meet its various mission needs, and DOE's National Nuclear Security Administration (NNSA) supports an Advanced Simulation & Computing Program, the Department's applied energy programs have no such equivalent base of computing expertise. The Committee believes that it is unnecessary, and potentially counter-productive, to create a separate new computational organization for these applied programs. Instead, the Committee believes that ASCR should have a lead role in coordinating and carrying out all unclassified computational research activities across the Department under the direction of the Under Secretary for Science. The Committee is encouraged by ASCR's recent joint workshops and activities with several of the Department's applied programs, and believes that an overall plan to address the unique computational research needs of the Offices of Energy Efficiency and Renewable Energy, Electricity Delivery and Energy Reliability, Fossil Energy, and Nuclear Energy is warranted, even as it continues to provide significant support to the other Office of Science programs.

The Committee commends the U.S. high energy physics community, and the High Energy Physics Advisory Panel in particular, for

setting clear, well-reasoned priorities under four realistic budget scenarios in the 2008 Particle Physics Project Prioritization Panel (P5) report. Section 108 is largely reflective of this report's top recommendations, as well as those of other recent reports on particle physics research priorities by the National Academy of Sciences. The Committee finds that the unknown nature of dark energy is one of the most fundamental questions facing the field of physics today, and strongly encourages the Department to move forward on the study of dark energy through both space-based and land-based projects and experiments. The Committee encourages the Department to develop budgets that allow the Office of Science's High Energy Physics Program to help sustain a robust dark energy research portfolio. The Committee also encourages the Department to continue to pursue its collaboration with NASA on a space-based dark energy mission, and ensure that the mission is consistent with research priorities for such a project as identified by the High Energy Physics Advisory Panel. Similarly, the Committee urges the Department to explore international partnerships that will further its dark energy research capabilities.

The Committee recognizes the significant progress that the fusion energy research community has made over the past fifteen years in understanding the plasma science that will underlie a future fusion reactor. The Committee finds that while the Department is already pursuing the critical next steps in plasma science of carrying out experimental research to control and examine the dynamics of a burning fusion plasma, a stronger focus should be concurrently placed on developing the enabling technologies required to practically harness fusion power for reliable baseload electricity. As such, the ITER international fusion project is a necessary but insufficient step on the road to commercial fusion power. The Committee encourages the Office of Science's Fusion Energy Sciences Program (FES) to closely collaborate with BES, ASCR, the Office of Nuclear Energy, and NNSA, under the direction of the Under Secretary for Science, to address mutual needs for technology development in magnetic fusion, inertial fusion, and next-generation fission reactor concepts. One focus area of these collaborations should be on identifying, characterizing, and developing new materials that can endure the intense neutron and heat fluxes expected in these reactor environments. The Committee expects the Department to consider these nuclear technology needs as it develops its prioritization plan, described in Section 607(c). This plan is expected to follow the example of the High Energy Physics Advisory Panel's P5 report, referenced above, in providing clear priorities in magnetic fusion research and technology development, including facility construction and decommissioning, under four realistic budget scenarios. These scenarios need not mirror the four scenarios that the P5 report considered (i.e. FY10 + inflation, FY09 + inflation, budget doubling from FY07 appropriated level by FY17, and additional funding above that level), as the Committee recognizes that the construction of ITER may continue to fluctuate and distort total FES funding over the next 10 years. Two scenarios that the Department should consider analyzing include: (1) flat funding at FY10 levels for the non-ITER portion of the FES budget; and (2) a path which doubles total funding for FES from the FY07 appropriated level before FY20.

The Committee commends the Secretary for requesting a major report from the National Academies which will lay the framework for a robust inertial fusion research and technology development program. However, the Committee believes that the Secretary need not wait for the recommendations of this report to begin an explicit, modest version of such a program, as several significant research areas have already been well-identified. These areas include new, potentially less expensive ways to achieve ignition, as well as the development of new technologies to increase beam repetition rates. While, as described above, cross-cutting research areas should be strongly considered by the Secretary in developing the magnetic fusion prioritization plan, the plan's budget scenarios are not expected to take into account a potentially significant new inertial fusion program, which may not be housed within the Office of Science once it is ultimately established. Provided that the Department begins to publicly, explicitly support grant awards in inertial fusion research and technology development for energy applications on a competitive, merit-reviewed basis, the Committee does not currently have a position on where within the Department this new program should primarily reside, or whether its activities should be distributed through several DOE subagencies.

The Committee strongly supports the Nuclear Physics (NP) Program's continued stewardship of isotope development and production for research applications, an activity which was formally transferred from the Office of Nuclear Energy in FY 2009. The Committee encourages NP to continue its outreach and coordination activities with other agencies to meet critical applied research, health, and security needs.

As the Office of Science's overall funding level follows a doubling path, the Committee supports setting priorities based on national competitiveness for the levels of increased funding that each program within the agency receives. However, the Committee also strongly supports increased funding above inflation for the nuclear physics, high energy physics, and fusion energy research programs, and does not support funding decreases to these programs outside of expected budget profiles for facility construction.

The Committee recognizes the significant backlog of approved but long-delayed infrastructure projects at national laboratories, and encourages the Director of the Office of Science to provide the necessary expertise and resources to carry out its Infrastructure Modernization Initiative Program Management Plan, published in September 2008.

The Committee supports the Deputy Secretary's efforts to address significant issues resulting from DOE's regulation of its own laboratories for decades. These issues include the inappropriate application of many regulations to all of the DOE laboratories, regardless of whether the lab primarily conducts nuclear security activities or basic experiments in high energy physics. This practice can unnecessarily increase the administrative costs of the labs that mainly focus on unclassified research, and create overlapping restraints on management activities that can ultimately hinder a lab's ability to contribute to U.S. competitiveness. Lastly, there is an inherent conflict of interest in the Department regulating itself. The Committee highly recommends that the Deputy Secretary consider external federal regulation of its non-nuclear security labora-

tories through partnerships with the Occupational Health and Safety Administration and the Nuclear Regulatory Commission.

The Committee encourages the Secretary to address the recommendations of the July 2009 report by the National Academy of Public Administration regarding the Department's management of human capital. Furthermore, while this report focuses on ways to improve DOE's hiring practices, the Committee also encourages the Department to improve its accountability practices for career employees. Specifically, the Committee believes that there should be a far more credible and explicit link between job performance and continued employment at the Department.

Section 605—Biological and Environmental Research

The Committee recognizes the important work of the Biological and Environmental Research (BER) Program in the Office of Science (SC). This section identifies priority areas for research that the Committee believes have special significance given the current challenges the country faces with climate change and dependence on foreign oil. Although Section 605 is primarily divided into two activity areas, this formatting structure is not intended to imply that the Department should treat the biological system science activities as distinctly different from the climate and environmental science activities. The Committee is not mandating a specific organizational structure. The Committee encourages the Department to seek synergistic joint activities within the program and outside the program with other offices in SC and Department wide, specifically with the Office of Biomass in the Office Energy Efficiency and Renewable Energy (EERE). Furthermore, specific climate research activities should be conducted in collaboration with the United States Global Climate Change Research Program (USGCRP).

The Committee believes the biological system science activities are critically important to fundamental science that could create breakthroughs in biomass-based liquid transportation fuels, biobased products and bioenergy. The Committee intends these terms to be interpreted broadly, but activities should be focused on the missions of the Department. The term biomass-based liquid transportation fuel includes any fuel which can be used in the transportation sector. The Committee believes that the Department needs to continue to conduct research on ethanol from a variety of feedstocks, but should broaden its focus to other fuels which can be used in existing infrastructure. Fuels that are chemically identical to gasoline, diesel, jet-fuel, hydrogen, and other fuels that are currently in use, but produced from fossil fuels should be researched.

The Committee recognizes that there are significant challenges to achieving the production of sustainably grown biomass for fuels, energy, and products. The Committee strongly encourages BER to not only focus on energy production from plants, microbes, and other biological processes, but also on other environmental characteristics. Water consumption, nutrient uptake, insect resistance, climate impacts and other considerations should be part of the feedstock selection process for research conducted at BER, and specifically for sequencing at the Joint Genome Institute (JGI).

The Bioenergy Research Centers (BRCs) established in the Energy Independence and Security Act of 2007 have already contributed to the Department's mission of "promoting America's energy

security through reliable, clean, and affordable energy.” It is not the intent of the Committee to change the current focus of the existing BRCs, which is to produce biomass-based liquid transportation fuels. In fact, the Committee believes that the majority of research conducted at the BRCs should continue to focus on fuels. Still, the addition of biobased products in this section is to allow for the BRCs to pursue biobased product opportunities that may arise from the research they are conducting on fuels. Similar biological processes and techniques used to create fuels can be used to produce biobased products. The Committee recognizes the importance of biobased products because they can replace fossil fuel based chemicals and materials. Additionally, biobased products, when produced in the biorefinery model (pursued in EERE), are high value co-products that can make the overall economics of a biorefinery more viable. This is the same business model that oil companies use today. Therefore, the Committee believes that if a BRC has a breakthrough discovery related to a product that is currently being produced using fossil fuels as a feedstock, then the BRC should be able to pursue that new biobased product discovery. Furthermore, it is the intent of the Committee for the three BRCs to be geographically distributed across the country. This is important because biomass feedstocks are different and face different growing, harvesting, transportation and conversion needs across the country. This requirement for the BRCs in no way implies that the merit-reviewed process should be compromised. Additionally, the Committee notes that it is up to the discretion of the Director on whether or not the existing BRCs should be able to reapply for a 5 year period after the first 5 year period is finished. If there is a reapplication process, the Committee believes that it should be competitive and merit-reviewed.

The Committee understands the development of the synthetic biology plan will require a systematic approach that involves several federal agencies, that is transparent to Congress and the public, and that provides opportunities for dialogue and input from the various stakeholders who will assist in the development of the plan. The Committee recognizes that there are important environmental, health and safety questions associated with the production of genetically modified organisms. The Committee believes that there is a role for the Federal government to play in the evolving synthetic biology industry, but intends for the Department to gather much more information before it fully engages. This is especially important as it relates to the possible development of standard components, parts and systems produced through synthetic biology. Intellectual property rights are a particularly important area of concern for synthetic biology. Developing the appropriate types of public-private partnerships will be critical in accelerating the development of fuels, power, and products from biological processes.

The Committee believes the Department’s current efforts to develop the systems biology knowledgebase are very constructive. Specific collaboration with the Advanced Scientific Computing Research (ASCR) program is critical to ensure that there is no duplication of activities. In particular steps taken to “acquire or otherwise ensure the availability of hardware for biology-specific computation” should likely be conducted by ASCR, not BER. Furthermore, the systems biology knowledgebase will only be as useful as

the knowledge that it includes. Therefore, the Committee believes that as part of the establishment and maintenance of the knowledgebase, BER should develop an outreach strategy with the purpose of alerting the biology community of this new resource and its tools, and a strategy for gathering biology-specific information to include in the knowledgebase.

The Committee finds that the climate and environmental activities of the BER program are vital to the Department's mission of "protecting the environment by providing a responsible resolution to the environmental legacy of nuclear weapons production." The Committee recognizes the importance of subsurface biogeochemistry research in dealing with the nuclear weapon and energy legacy issues of the Department. The cost of cleaning up the Department's contaminated sites is a tremendous weight on DOE's budget. Therefore, the Committee believes that BER's current subsurface research activities should be coordinated by the Under Secretary for Science, who will be able to prioritize activities to support and accelerate the decontamination of DOE sites. Furthermore, the Department's role in climate research has been well established, and the Committee anticipates that the Department will continue to offer its technical and scientific experiences and expertise through the United States Global Climate Change Research Program (USGCRP). However, the Committee recognizes that several federal agencies contribute to the country's understanding of climate science and that each agency has specific expertise that should not be overlooked.

In particular the National Oceanic and Atmospheric Administration (NOAA) has principal authorities for ocean, atmospheric and climate research and observations, as well as for managing ocean and marine resources and the coastal zone, including evaluating potential environmental impacts of energy development in the ocean. NOAA, along with DOE, the National Aeronautics and Space Administration (NASA), and the National Science Foundation (NSF), is also a leader in understanding, observing, modeling and predicting climate variability and change. Through the USGCRP, the White House Ocean Policy Task Force, and other interagency efforts, NOAA works closely with the Department to coordinate and leverage oceanic and atmospheric science activities and capabilities. The Committee encourages the Department to work with NOAA in these areas, as they apply to NOAA's mission responsibilities.

The Committee believes that observations are essential to improving climate and earth modeling and to expanding and refining our understanding of climate variability and change. The Committee recognizes that infrastructure to support observations is costly to design, acquire, and maintain and that significant resources are also required to properly document and archive the data and information obtained from them. Therefore, the Committee encourages the Department to work closely with the other federal agencies in the USGCRP to ensure that the gaps in the AmeriFlux Network are filled in with new observation facilities. This is especially important as it relates to dynamic terrestrial landscapes such as forests which have recently burned or have severe insect infestations. The Committee encourages the Department to continue to upgrade its facilities and develop appropriate

tools to understand the flux of other greenhouse gases besides carbon dioxide from terrestrial ecosystems. It is critical that the AmeriFlux Network work with other observation networks in the United States and in other countries. The Committee anticipates the need for better observation data due to increased interest in the changing climate and the understanding that there will be regional impacts to these changes. Therefore, the need to have observational data that is distributed throughout the country will be very important.

Furthermore, the Committee finds that research on the changing climate is critically important to the global community and must be carried out with significant collaboration with international partners. As a result, the Committee encourages the Department to continue and expand its work with international climate scientists. Work directly related to regional and global climate modeling is especially important as it relates to the Intergovernmental Panel on Climate Change (IPCC) 4th Assessment Report. Increased support to meet the growing challenges developing from climate change should continue to be a priority to the whole BER program.

The Committee notes the good work of the BER user facilities including the Joint Genome Institute, the Atmospheric Radiation Measurement (ARM) Climate Research Facility (ACRF) and the Environmental Molecular Sciences Laboratory (EMSL). These facilities are critical assets to the country and continued success is dependent on regularly scheduled upgrades. This is also highly important to international competitiveness as other countries such as China build their inventory of scientific tools such as sequencing machines.

Subtitle B—Advanced Research Projects Agency—Energy

The Committee intends for ARPA-E to play a variety of roles in the nation's energy technology enterprise. The primary motivations for establishing ARPA-E were the need for transformational technologies that improve U.S. energy security and energy efficiency, and reduce the environmental impacts of energy. However, both the Gathering Storm panel and Congress also advocated for ARPA-E to serve as a new tool for the Secretary to use in reinventing Department's approach to energy R&D. While it may take years to see the commercial application of successful ARPA-E technology projects, it is the Committee's view that ARPA-E has already succeeded in providing an innovative organizational model within DOE.

Critics of the DOE's management of research programs contend that the stove-piped structure and bureaucratic culture of DOE have not been conducive to the rapid development of cross-cutting energy solutions and translating basic research discoveries into technology applications for the marketplace. Potentially revolutionary research may be too risky or multi-disciplinary to fit into a specific program's mission at DOE, and the conventional peer review system tends to favor established investigators pursuing incremental advances in well-understood concepts. Many contend that, compared with investment, the Department has demonstrated limited success in pushing technologies beyond the proverbial "Valley of Death" between government-sponsored R&D and the marketplace.

The Committee believes that, to pursue truly innovative and transformational technology development, ARPA-E must conduct projects and be organized in a manner that is fundamentally different from that of the traditional DOE approach. To ensure rapid decision-making and minimize transactional requirements, the reporting structure should remain lean and largely self-contained. Additionally, staff at ARPA-E are expected to take all appropriate measures to ensure that technology projects of particular promise can be transferred to the private sector. While the Director may choose to enhance the operational capabilities of ARPA-E with additional staff, it is the intent of the Committee for ARPA-E to grow only as much as is necessary to carry out its mission. In order for ARPA-E to maintain its unique agility and its independence within DOE, the Committee believes that both Departmental and ARPA-E leadership must be vigilant in avoiding overly-burdensome requirements and impediments imposed by a risk-averse Departmental bureaucracy.

The Committee believes the overwhelming response to the initial Funding Opportunity Announcements is further evidence that technological innovation is not limited to large research universities, national laboratories, and industrial firms. The Committee intends for ARPA-E to engage non-traditional research performers whenever possible. In the long-term, these activities should result in a stronger and more diverse domestic community of researchers and technology developers focused on pushing transformational energy solutions into the marketplace. This requires ARPA-E to be aggressive in reaching out to academia (beyond the traditional research universities), small businesses, and individual inventors, and to explore innovative cost-sharing arrangements that appropriately match their financial resources, where applicable. While the Committee does not require that a certain percentage of funds be awarded to these entities, it is the Committee's view that ARPA-E should recognize the critical role they play in our nation's technological competitiveness by seeking opportunities to fund relevant activities in these sectors.

It is well known that small businesses are the engines of our economy and the driving force of job creation in the U.S. Particularly relevant to ARPA-E's mission is the fact that the smallest businesses—those with fewer than 25 employees—are the greatest sources of technology innovation in the United States. This was affirmed in a November 2008 study commissioned by the Small Business Administration (SBA). "An Analysis of Small Business Patents by Industry and Firm Size" noted that: "Small businesses develop more patents per employee than larger businesses, with the smallest firms, those with fewer than 25 employees, producing the greatest number of patents per employee. Furthermore, small firm patents tend to be more significant than large firm patents, outperforming them in a number of categories including growth, citation impact, and originality." Furthermore, the report identified alternative energy as one of 11 of the most promising emerging industries. For example, three of four of the most patent-intensive firms active in battery manufacturing are small businesses. The Committee seeks to further ensure America's technological leadership by empowering ARPA-E to actively search for, accept solicitations from, and evaluate ideas from America's richest and most vibrant

source of talented individuals among our smallest business entrepreneurs.

The Committee also believes that ARPA-E should mirror DARPA's flexibility and openness in another important aspect. Thus far, ARPA-E has issued one broad Funding Opportunity Announcement (FOA), and two FOA's focused on specific technology areas. All had limited timeframes for applicants to submit their proposals. DARPA, in addition to the standard calls for specific proposals, issues Broad Agency Announcements (BAA) that remain open for extended periods of time and are not limited to a narrow field of research or technology. This allows Program Directors within DARPA to review and fund proposals that may be very promising but do not otherwise fit within the scope of a more specific funding opportunity. It is the Committee's intent for ARPA-E to be as flexible as possible, including through the usage of a rolling solicitation similar to DARPA's Broad Agency Announcement, as long as it is consistent with the mission of ARPA-E and all federal contracting regulations.

Subtitle C—Energy Innovation Hubs

The Committee on Science and Technology believes that the Energy Innovation Hubs program is an important research initiative that will provide the Department of Energy with a unique and effective means to foster innovative and advanced energy technologies. The Committee encourages the Secretary of Energy to consider any application for a Hub award that may not have all of its activities centrally located, but, through modern information and communication technologies, are able to replicate the type of synergies between individuals that can be fostered through activities conducted at a single location. The Committee recognizes the value in a centrally located Hub, but believes that an effort to conduct activities under one roof should not be undertaken to the detriment of the science to be conducted.

In carrying out the selection of a Hub award winner, the Secretary should give priority consideration to consortia in which 1 or more members is an institution described in Section 632(g). However, this section should not be interpreted to mean that a Hub must be awarded to a consortium including such one of these institutions. Nor should it be construed that Section 623(g) requires that a Hub must be located at one of these institutions.

The Committee believes that the exception to the prohibition on construction in Section 632(e)(2) is a necessary exclusion to allow for renovations to existing facilities or construction of a test bed when those activities are required for the undertaking of necessary research by the Hub to achieve its mission. Without this exception, a Hub would be unable to build test beds that might be necessary for testing innovative technologies in real world situations even if limited in scale and scope. In the case of a building innovations Hub this is of particular interest. The Committee's concern that a Hub award winner may endeavor to misuse funding for the construction of a new facility for a purpose other than the research of the specified technology focus resulted in the prohibition on construction language in Section 632(e)(1). The Committee does not intend that the exception to this prohibition in Section 632(e)(2) should be applied for any reason other than for those instances

where a Hub must build a test bed or renovate its existing facilities. The Committee commends the Secretary to take all measures to ensure that the Oversight Board will examine any plan for renovation or test bed construction and ensure the scope and scale of the undertaking is limited to that which is necessary for the research to be conducted. The Committee urges the Secretary to appoint members to an Oversight Board pursuant to this title that in addition to other qualifications required to effectively administer the Energy Innovations Hubs program, will have the expertise and skill to evaluate any renovations or test bed construction undertaken by a Hub. This evaluation should ensure that all renovations or test beds are necessary to satisfy the mission of the Hub and are not a means to create a long-term facility for another purpose. Furthermore, any research to be done at a test bed proposed by a Hub should be evaluated to ensure that it could not be conducted in a more cost-efficient manner.

IX. COST ESTIMATE

A cost estimate and comparison prepared by the Director of the Congressional Budget Office under section 402 of the Congressional Budget Act of 1974 has been timely submitted to the Committee on Science and Technology prior to the filing of this report and is included in Section X of this report pursuant to House Rule XIII, clause 3(c)(3).

H.R. 5166 does not contain new budget authority, credit authority, or changes in revenues or tax expenditures. Assuming that the sums authorized under the bill are appropriated, H.R. 5166 does authorize additional discretionary spending, as described in the Congressional Budget Office report on the bill, which is contained in Section X of this report.

X. CONGRESSIONAL BUDGET OFFICE COST ESTIMATE

H.R. 5116—America COMPETES Reauthorization Act of 2010

Summary: H.R. 5116 would authorize appropriations totaling about \$86 billion over the 2011–2015 period for several agencies to support scientific research, industrial innovation, and certain educational activities. Assuming appropriation of the necessary amounts, CBO estimates that implementing the legislation would cost about \$65 billion over the 2011–2015 period, and about \$20 billion after 2015. Enacting the legislation could increase revenues (from certain fees) and associated direct spending; therefore, pay-as-you-go procedures would apply. However, CBO estimates that the net effects would be negligible for each year.

H.R. 5116 contains no intergovernmental or private-sector mandates as defined in the Unfunded Mandates Reform Act (UMRA) and would impose no costs on state, local, or tribal governments.

Estimated cost to the Federal Government: The estimated budgetary impact of H.R. 5116 is shown in the following table. The costs of this legislation fall within budget functions 250 (general science, space, and technology), 270 (energy), 370 (commerce and housing credit), 450 (community and regional development), and 800 (general government).

	By fiscal year, in millions of dollars—					
	2011	2012	2013	2014	2015	2011–2015
CHANGES IN SPENDING SUBJECT TO APPROPRIATION						
National Science Foundation:						
Research and Related Activities:						
Authorization Level	6,020	6,496	7,009	7,562	8,160	35,247
Estimated Outlays	1,084	3,758	5,379	6,346	7,148	23,715
Education and Human Resources:						
Authorization Level	945	1,020	1,100	1,187	1,281	5,533
Estimated Outlays	113	500	786	989	1,115	3,504
Other National Science Foundation Activities:						
Authorization Level	520	615	659	687	720	3,200
Estimated Outlays	327	466	581	657	709	2,740
Subtotal, National Science Foundation:						
Authorization Level	7,485	8,131	8,768	9,436	10,161	43,980
Estimated Outlays	1,524	4,724	6,746	7,993	8,972	29,958
Department of Energy:						
Office of Science:						
Authorization Level	5,247	5,614	6,007	6,428	6,878	30,174
Estimated Outlays	2,886	4,662	5,775	6,180	6,612	26,115
Other Department of Energy Activities:						
Estimated Authorization Level	530	718	943	1,171	1,384	4,746
Estimated Outlays	292	554	814	1,035	1,254	3,948
Subtotal, Department of Energy:						
Estimated Authorization Level	5,777	6,332	6,950	7,599	8,262	34,920
Estimated Outlays	3,177	5,216	6,589	7,214	7,866	30,062
National Institute of Standards and Technology:						
Scientific and Technical Research:						
Authorization Level	620	657	697	739	783	3,495
Estimated Outlays	477	636	687	728	772	3,300
Industrial Technology Services:						
Authorization Level	246	250	261	264	276	1,297
Estimated Outlays	39	149	220	251	265	924
Facility Construction and Maintenance:						
Authorization Level	125	85	122	124	133	589
Estimated Outlays	15	28	47	86	100	275
Subtotal, National Institute of Standards and Technology:						
Authorization Level	991	992	1,080	1,126	1,192	5,382
Estimated Outlays	532	813	953	1,064	1,137	4,499
Economic Development Administration:						
Regional Innovation Cluster Program:						
Estimated Authorization Level	200	200	200	200	200	1,000
Estimated Outlays	10	54	98	154	194	510
Loan Guarantee Program:						
Authorization Level	50	50	50	50	50	250
Estimated Outlays	10	40	47	50	50	197
Subtotal, Economic Development Agency:						
Estimated Authorization Level	250	250	250	250	250	1,250
Estimated Outlays	20	94	145	204	244	707
Office of Science and Technology Policy:						
Estimated Authorization Level	10	10	10	10	10	50
Estimated Outlays	9	10	10	10	10	49
Total Changes:						
Estimated Authorization Level	14,513	15,716	17,058	18,412	19,875	85,582
Estimated Outlays	5,262	10,857	14,442	16,485	18,229	65,275

Note: Components May not sum to totals because of rounding.

Basis of estimate: For this estimate, CBO assumes H.R. 5116 will be enacted in 2010 and that the necessary amounts will be appropriated for each fiscal year. Estimated outlays are based on historical spending patterns for existing and similar programs.

National Science Foundation (NSF) Programs

H.R. 5116 would authorize appropriations totaling nearly \$44 billion over the 2011–2015 period for the National Science Foundation to carry out various activities to support basic scientific research and education.

Research and Related Activities. The bill would authorize the appropriation of \$35.2 billion over the 2011–2015 period for programs under NSF’s research and related activities account. In 2010, those programs received an appropriation of \$5.6 billion to support most of NSF’s basic science, technology, engineering, and mathematics (STEM) research. Based on historical spending patterns, CBO estimates that this provision would cost \$23.7 billion over the 2011–2015 period and \$11.5 billion after 2015.

Education and Human Resources. The legislation would authorize the appropriation of \$5.5 billion over the 2011–2015 period for NSF’s education and human resources programs. In 2010, those programs received an appropriation of \$873 million to support and expand information regarding STEM and in the workforce in those fields. Based on historical spending patterns, CBO estimates that implementing this provision would cost \$3.5 billion over the 2011–2015 period and about \$2 billion after 2015.

Other NSF Activities. H.R. 5116 would authorize the appropriation of \$3.2 billion over the 2011–2015 period for other NSF activities, including agency operations and award management (\$1.9 billion), major research equipment and facilities construction (\$1.2 billion), the Office of the Inspector General (\$80 million), the Office of the National Science Board (\$26 million), and a pilot program (\$12 million) to award cash incentives for private entities to develop certain innovative technologies. In 2010, NSF received appropriations totaling \$436 million for those activities. Based on historical spending patterns, CBO estimates that implementing those provisions would cost \$2.7 billion over the 2011–2015 period and about \$500 million after 2015, assuming appropriation of the specified amounts.

Department of Energy (DOE) Programs

CBO estimates that H.R. 5116 would authorize the appropriation of about \$35 billion over the 2011–2015 period for the Department of Energy to carry out various activities to support scientific research and education.

Office of Science. The bill would authorize the appropriation of \$30.2 billion over the 2011–2015 period for DOE research programs in basic energy sciences, biological and environmental sciences, and computational science. In addition, those funds would be used by DOE to manage 10 national laboratories and to support certain education initiatives. In 2010, DOE received appropriations totaling \$4.9 billion to carry out those activities. Assuming appropriation of the specified amounts, CBO estimates that implementing this provision would cost \$26.1 billion over the 2011–2015 period and \$4.1 billion after 2015.

Other DOE Activities. The legislation would authorize appropriations totaling \$4.3 billion over the 2011–2015 period for the Advanced Research Project Agency-Energy (\$3.2 billion), which funds the research and development of projects with potential energy and environmental applications; the energy innovation hub program

(\$860 million), which would fund research teams working to develop innovative technologies with practical industry applications; and the energy applied science talent expansion program (\$176 million), which would provide grants to higher education institutions to enhance STEM education. Assuming appropriation of the specified amounts, CBO estimates that implementing those provisions would cost almost \$3.6 billion over the 2011–2015 period and about \$750 million after 2015.

H.R. 5116 also would authorize the appropriation of such sums as are necessary to reauthorize and expand certain STEM educational programs, which would support students, teachers, and researchers at secondary and post-secondary institutions and to establish the cooperative research and development fund, which would cover the federal share of research and development agreements between the federal government and nonfederal entities. Based on information from DOE and assuming appropriation of the necessary amounts, CBO estimates that implementing those programs would cost \$481 million over the 2011–2015 period and \$80 million after 2015.

National Institute of Standards and Technology (NIST) Programs

H.R. 5116 would authorize the appropriation of almost \$5.4 billion over the 2011–2015 period for programs administered by the National Institute of Standards and Technology.

Scientific and Technical Research. The bill would authorize the appropriation of about \$3.5 billion over the 2011–2015 period for NIST's Scientific and Technical Research Services program. The program supports NIST's laboratories and technical programs as well as national research facilities, including the Center for Nanoscale Science and Technology. Assuming appropriation of the specified amounts, CBO estimates that implementing this provision would cost \$3.3 billion over the 2011–2015 period and about \$200 million after 2015.

Industrial Technology Services. The legislation would authorize the appropriation of \$1.3 billion over the 2011–2015 period to operate programs under the industrial technology services account. Those amounts would be used primarily to fund two programs, the manufacturing extension partnership (\$800 million), which provides technical assistance and training to small manufacturers, and the Technology Innovation Program (\$400 million), which provides grants to small- and medium-sized businesses to support research and development on emerging technologies. Additional amounts would be authorized for the Malcolm Baldrige National Quality Awards Program (\$50 million). Assuming appropriation of the specified amounts, CBO estimates that implementing this provision would cost \$924 million over the 2011–2015 period and \$373 million after 2015.

Facility Construction and Maintenance. H.R. 5116 would authorize the appropriation of \$589 million over the 2011–2015 period for construction and maintenance of NIST buildings and laboratories. Assuming appropriation of the specified amounts, CBO estimates that implementing this provision would cost \$275 million over the 2011–2015 period and \$314 million after 2015.

Economic Development Administration (EDA) Programs

H.R. 5116 would authorize appropriations totaling about \$1.3 billion over the 2011–2015 period for two Economic Development Administration programs to support the development of innovative technologies to aid small- and medium-sized businesses.

Regional Innovation Cluster Program. The bill would authorize the appropriation of whatever amounts are necessary to support regional innovation clusters (geographically related groups of businesses focused on developing technologies for a particular industry sector). Under the bill, EDA would provide technical assistance and competitive grants to support the development of regional innovation clusters. The bill also would require EDA to contract with the National Academy of Sciences (NAS) to evaluate the effectiveness of the program. Based on information from EDA and NAS, CBO estimates that implementing this provision would cost \$510 million over the 2011–2015 period and \$490 million after 2015.

Loan Guarantee Program. The legislation would establish an EDA program to provide loan guarantees to small- and medium-sized businesses to support the development of innovative manufacturing technologies. Under the Federal Credit Reform Act, the budgetary impact of the program would be measured in terms of the projected subsidy cost to provide such guarantees. (The subsidy cost is the estimated long-term cost—the value of defaults less recoveries—to the government of the loan guarantee calculated on a net-present-value basis, excluding administrative costs.) The bill would authorize \$50 million a year over the 2011–2015 period for the subsidy cost of providing loan guarantees under the program. CBO estimates that the program would cost about \$200 million over the 2011–2015 period. Based on information from Standard and Poor’s regarding the cumulative default and recovery rates for bonds with similar risk profiles, CBO estimates that the subsidy rate for the program would be between 15 percent and 20 percent. Therefore, we estimate that the program would allow EDA to guarantee roughly \$300 million in loans each year over the 2011–2015 period.

The legislation also would authorize EDA to convert those loan guarantees into direct loans if borrowers were in risk of imminent default. The Congress would have to appropriate additional funds to cover the subsidy cost of any such direct loans prior to those loans being disbursed. CBO expects that the Secretary would use this authority infrequently and that any direct loan made under this authority would have a very high subsidy rate. Furthermore, CBO expects that it would be infeasible for the Congress to appropriate the necessary funds to convert a loan guarantee in imminent danger of default to a direct federal loan once the Secretary has chosen to exercise that authority. Therefore, we estimate that this provision would have no significant cost.

Office of Science and Technology Policy

Under H.R. 5116, the Office of Science and Technology Policy would be required to submit additional reports to the Congress and prepare planning documents regarding nanotechnology and networking and research on information technology. Based on information from that office, the coordinating agencies, and the member agencies, as well as the cost of similar provisions, CBO estimates

that implementing those provisions would cost about \$50 million over the 2011–2015 period, assuming appropriation of the necessary amounts.

Pay-as-you-go considerations: The Statutory Pay-As-You-Go Act of 2010 establishes budget reporting and enforcement procedures for legislation affecting direct spending or revenues. H.R. 5116 would allow EDA to collect fees to cover administrative costs related to a loan guarantee program to provide loans to small- and medium-sized businesses to support the development of innovative manufacturing technologies. The collection of those fees would increase revenues and associated direct spending; therefore, pay-as-you-go procedures would apply. However CBO estimates that any increase in revenues from fees would be offset by similar increases in direct spending for administrative expenses. The net budgetary changes that are subject to pay-as-you-go procedures are shown in the following table.

CBO Estimate of Pay-As-You-Go Effects for H.R. 5116, the America COMPETES Reauthorization Act of 2010, as ordered reported by the House Committee on Science and Technology on April 28, 2010

	By fiscal year, in millions of dollars—													
	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2010–2015	2010–2020	
	NET INCREASE OR DECREASE (-) IN THE DEFICIT													
Statutory Pay-As-You-Go Impact	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Intergovernmental and private-sector impact: H.R. 5116 contains no intergovernmental or private-sector mandates as defined in UMRA. Public colleges, universities, and research centers could benefit from grants authorized by the bill.

Estimate prepared by: Federal Costs: Jeff LaFave (NSF, DOE, NIST, EDA programs) Matthew Pickford (Office of Science and Technology Policy programs); Impact on State, Local, and Tribal Governments: Ryan Miller; Impact on the Private Sector: Amy Petz.

Estimate approved by: Theresa Gullo, Deputy Assistant Director for Budget Analysis.

XI. COMPLIANCE WITH PUBLIC LAW 104–4

H.R. 5116 contains no unfunded mandates.

XII. COMMITTEE OVERSIGHT FINDINGS AND RECOMMENDATIONS

The oversight findings and recommendations of the Committee on Science and Technology are reflected in the body of this report.

XIII. STATEMENT ON GENERAL PERFORMANCE GOALS AND OBJECTIVES

Pursuant to clause 3(c) of House Rule XIII, the goal of H.R. 5116 is to reauthorize the National Science Foundation, National Institute of Standards and Technology, the Office of Science at the Department of Energy, and the Advanced Research Projects Agency—Energy. H.R. 5116 also authorizes new programs at the Depart-

ment of Energy and the Department of Commerce that also promote innovation and improve the competitiveness of the United States.

XIV. CONSTITUTIONAL AUTHORITY STATEMENT

Article I, section 8 of the Constitution of the United States grants Congress the authority to enact H.R. 5116.

XV. FEDERAL ADVISORY COMMITTEE STATEMENT

The functions of the advisory committees authorized in H.R. 5116 are not currently being nor could they be performed by one or more agencies or by enlarging the mandate of another existing advisory committee.

XVI. CONGRESSIONAL ACCOUNTABILITY ACT

The Committee finds that H.R. 5116 does not relate to the terms and conditions of employment or access to public services or accommodations within the meaning of section 102(b)(3) of the Congressional Accountability Act (Public Law 104-1).

XVII. EARMARK IDENTIFICATION

H.R. 5116 does not contain any congressional earmarks, limited tax benefits, or limited tariff benefits as defined in clause 9 of Rule XXI.

XVIII. STATEMENT ON PREEMPTION OF STATE, LOCAL, OR TRIBAL LAW

This bill is not intended to preempt any state, local, or tribal law.

CHANGES IN EXISTING LAW MADE BY THE BILL, AS REPORTED

In compliance with clause 3(e) of rule XIII of the Rules of the House of Representatives, changes in existing law made by the bill, as reported, are shown as follows (existing law proposed to be omitted is enclosed in black brackets, new matter is printed in italics, existing law in which no change is proposed is shown in roman):

21ST CENTURY NANOTECHNOLOGY RESEARCH AND DEVELOPMENT ACT

* * * * *

SEC. 2. NATIONAL NANOTECHNOLOGY PROGRAM.

(a) * * *

(b) PROGRAM ACTIVITIES.—The activities of the Program shall include—

(1) * * *

* * * * *

[(5) ensuring United States global leadership in the development and application of nanotechnology;]

(5) ensuring United States global leadership in the development and application of nanotechnology, including through coordination and leveraging Federal investments with nanotech-

nology research, development, and technology transition initiatives supported by the States;

* * * * *

(c) PROGRAM MANAGEMENT.—The National Science and Technology Council shall oversee the planning, management, and coordination of the Program. The Council, itself or through an appropriate subgroup it designates or establishes, shall—

(1) * * *

* * * * *

[(4) develop, within 12 months after the date of enactment of this Act, and update every 3 years thereafter, a strategic plan to guide the activities described under subsection (b), meet the goals, priorities, and anticipated outcomes of the participating agencies, and describe—

[(A) how the Program will move results out of the laboratory and into application for the benefit of society;

[(B) the Program’s support for long-term funding for interdisciplinary research and development in nanotechnology; and

[(C) the allocation of funding for interagency nanotechnology projects;]

(4) develop, within 12 months after the date of enactment of the National Nanotechnology Initiative Amendments Act of 2010, and update every 3 years thereafter, a strategic plan to guide the activities described under subsection (b) that specifies near-term and long-term objectives for the Program, the anticipated time frame for achieving the near-term objectives, and the metrics to be used for assessing progress toward the objectives, and that describes—

(A) how the Program will move results out of the laboratory and into applications for the benefit of society, including through cooperation and collaborations with nanotechnology research, development, and technology transition initiatives supported by the States;

(B) how the Program will encourage and support interdisciplinary research and development in nanotechnology; and

(C) proposed research in areas of national importance in accordance with the requirements of section 105 of the National Nanotechnology Initiative Amendments Act of 2010;

* * * * *

(d) ANNUAL REPORT.—The Council shall prepare an annual report, to be submitted to the Senate Committee on Commerce, Science, and Transportation and the House of Representatives Committee on Science, and other appropriate committees, at the time of the President’s budget request to Congress, that includes—

(1) the Program budget, for the previous fiscal year, for each agency that participates in the Program, including a breakout of spending for the development and acquisition of research facilities and instrumentation, for each program component area, and for all activities pursuant to subsection (b)(10);

[(1)] *(2) the Program budget, for the current fiscal year, for each agency that participates in the Program, including a*

breakout of spending for the development and acquisition of research facilities and instrumentation, for each program component area, and for all activities pursuant to subsection (b)(10);

[(2)] (3) the proposed Program budget for the next fiscal year, for each agency that participates in the Program, including a breakout of spending for the development and acquisition of research facilities and instrumentation, for each program component area, and for all activities pursuant to subsection (b)(10);

[(3)] (4) an analysis of the progress made toward achieving the goals and priorities established for the Program;

[(4)] (5) an analysis of the extent to which the Program has incorporated the recommendations of the Advisory Panel; and

[(5)] (6) an assessment of how Federal agencies are implementing the plan described in subsection (c)(7), and a description of the amount of Small Business Innovative Research and Small Business Technology Transfer Research funds supporting the plan.

(e) *STANDARDS SETTING.*—*The agencies participating in the Program shall support the activities of committees involved in the development of standards for nanotechnology and may reimburse the travel costs of scientists and engineers who participate in activities of such committees.*

SEC. 3. PROGRAM COORDINATION.

(a) * * *

[(b) FUNDING.—The National Nanotechnology Coordination Office shall be funded through interagency funding in accordance with section 631 of Public Law 108–7.]

(b) *FUNDING.*—(1) *The operation of the National Nanotechnology Coordination Office shall be supported by funds from each agency participating in the Program. The portion of such Office's total budget provided by each agency for each fiscal year shall be in the same proportion as the agency's share of the total budget for the Program for the previous fiscal year, as specified in the report required under section 2(d)(1).*

(2) *The annual report under section 2(d) shall include—*

(A) *a description of the funding required by the National Nanotechnology Coordination Office to perform the functions specified under subsection (a) for the next fiscal year by category of activity, including the funding required to carry out the requirements of section 2(b)(10)(D), subsection (d) of this section, and section 5;*

(B) *a description of the funding required by such Office to perform the functions specified under subsection (a) for the current fiscal year by category of activity, including the funding required to carry out the requirements of subsection (d); and*

(C) *the amount of funding provided for such Office for the current fiscal year by each agency participating in the Program.*

* * * * *

(d) *PUBLIC INFORMATION.*—(1) *The National Nanotechnology Coordination Office shall develop and maintain a database accessible by the public of projects funded under the Environmental, Health, and Safety, the Education and Societal Dimensions, and the Nanomanufacturing program component areas, or any successor program*

component areas, including a description of each project, its source of funding by agency, and its funding history. For the Environmental, Health, and Safety program component area, or any successor program component area, projects shall be grouped by major objective as defined by the research plan required under section 103(b) of the National Nanotechnology Initiative Amendments Act of 2010. For the Education and Societal Dimensions program component area, or any successor program component area, the projects shall be grouped in subcategories of—

- (A) education in formal settings;
- (B) education in informal settings;
- (C) public outreach; and
- (D) ethical, legal, and other societal issues.

(2) The National Nanotechnology Coordination Office shall develop, maintain, and publicize information on nanotechnology facilities supported under the Program, and may include information on nanotechnology facilities supported by the States, that are accessible for use by individuals from academic institutions and from industry. The information shall include at a minimum the terms and conditions for the use of each facility, a description of the capabilities of the instruments and equipment available for use at the facility, and a description of the technical support available to assist users of the facility.

SEC. 4. ADVISORY PANEL.

(a) **IN GENERAL.**—The President shall establish [or designate] a National Nanotechnology Advisory Panel as a distinct entity. The Advisory Panel shall form a subpanel with membership having specific qualifications tailored to enable it to carry out the requirements of subsection (c)(7).

(b) **QUALIFICATIONS.**—The Advisory Panel established [or designated] by the President under subsection (a) shall consist primarily of members from academic institutions and industry. Members of the Advisory Panel shall be qualified to provide advice and information on nanotechnology research, development, demonstrations, education, technology transfer, commercial application, or societal and ethical concerns. In selecting [or designating] an Advisory Panel, the President may also seek and give consideration to recommendations from the Congress, industry, the scientific community (including the National Academy of Sciences, scientific professional societies, and academia), the defense community, State and local governments, regional nanotechnology programs, and other appropriate organizations. At least one member of the Advisory Panel shall be an individual employed by and representing a minority-serving institution.

* * * * *

[SEC. 5. TRIENNIAL EXTERNAL REVIEW OF THE NATIONAL NANOTECHNOLOGY PROGRAM.

[(a) **IN GENERAL.**—The Director of the National Nanotechnology Coordination Office shall enter into an arrangement with the National Research Council of the National Academy of Sciences to conduct a triennial evaluation of the Program, including—

- [(1) an evaluation of the technical accomplishments of the Program, including a review of whether the Program has

achieved the goals under the metrics established by the Council;

[(2) a review of the Program's management and coordination across agencies and disciplines;

[(3) a review of the funding levels at each agency for the Program's activities and the ability of each agency to achieve the Program's stated goals with that funding;

[(4) an evaluation of the Program's success in transferring technology to the private sector;

[(5) an evaluation of whether the Program has been successful in fostering interdisciplinary research and development;

[(6) an evaluation of the extent to which the Program has adequately considered ethical, legal, environmental, and other appropriate societal concerns;

[(7) recommendations for new or revised Program goals;

[(8) recommendations for new research areas, partnerships, coordination and management mechanisms, or programs to be established to achieve the Program's stated goals;

[(9) recommendations on policy, program, and budget changes with respect to nanotechnology research and development activities;

[(10) recommendations for improved metrics to evaluate the success of the Program in accomplishing its stated goals;

[(11) a review of the performance of the National Nanotechnology Coordination Office and its efforts to promote access to and early application of the technologies, innovations, and expertise derived from Program activities to agency missions and systems across the Federal Government and to United States industry;

[(12) an analysis of the relative position of the United States compared to other nations with respect to nanotechnology research and development, including the identification of any critical research areas where the United States should be the world leader to best achieve the goals of the Program; and

[(13) an analysis of the current impact of nanotechnology on the United States economy and recommendations for increasing its future impact.

[(b) **STUDY ON MOLECULAR SELF-ASSEMBLY.**—As part of the first triennial review conducted in accordance with subsection (a), the National Research Council shall conduct a one-time study to determine the technical feasibility of molecular self-assembly for the manufacture of materials and devices at the molecular scale.

[(c) **STUDY ON THE RESPONSIBLE DEVELOPMENT OF NANOTECHNOLOGY.**—As part of the first triennial review conducted in accordance with subsection (a), the National Research Council shall conduct a one-time study to assess the need for standards, guidelines, or strategies for ensuring the responsible development of nanotechnology, including, but not limited to—

[(1) self-replicating nanoscale machines or devices;

[(2) the release of such machines in natural environments;

[(3) encryption;

[(4) the development of defensive technologies;

[(5) the use of nanotechnology in the enhancement of human intelligence; and

[(6) the use of nanotechnology in developing artificial intelligence.]

[(d) EVALUATION TO BE TRANSMITTED TO CONGRESS.—The Director of the National Nanotechnology Coordination Office shall transmit the results of any evaluation for which it made arrangements under subsection (a) to the Advisory Panel, the Senate Committee on Commerce, Science, and Transportation and the House of Representatives Committee on Science upon receipt. The first such evaluation shall be transmitted no later than June 10, 2005, with subsequent evaluations transmitted to the Committees every 3 years thereafter.]

SEC. 5. TRIENNIAL EXTERNAL REVIEW OF THE NATIONAL NANOTECHNOLOGY PROGRAM.

(a) *IN GENERAL.*—The Director of the National Nanotechnology Coordination Office shall enter into an arrangement with the National Research Council of the National Academy of Sciences to conduct a triennial review of the Program. The Director shall ensure that the arrangement with the National Research Council is concluded in order to allow sufficient time for the reporting requirements of subsection (b) to be satisfied. Each triennial review shall include an evaluation of the—

- (1) research priorities and technical content of the Program, including whether the allocation of funding among program component areas, as designated according to section 2(c)(2), is appropriate;
- (2) effectiveness of the Program’s management and coordination across agencies and disciplines, including an assessment of the effectiveness of the National Nanotechnology Coordination Office;
- (3) Program’s scientific and technological accomplishments and its success in transferring technology to the private sector; and
- (4) adequacy of the Program’s activities addressing ethical, legal, environmental, and other appropriate societal concerns, including human health concerns.

(b) *EVALUATION TO BE TRANSMITTED TO CONGRESS.*—The National Research Council shall document the results of each triennial review carried out in accordance with subsection (a) in a report that includes any recommendations for ways to improve the Program’s management and coordination processes and for changes to the Program’s objectives, funding priorities, and technical content. Each report shall be submitted to the Director of the National Nanotechnology Coordination Office, who shall transmit it to the Advisory Panel, the Committee on Commerce, Science, and Transportation of the Senate, and the Committee on Science and Technology of the House of Representatives not later than September 30 of every third year, with the first report due September 30, 2010.

(c) *FUNDING.*—Of the amounts provided in accordance with section 3(b)(1), the following amounts shall be available to carry out this section:

- (1) \$500,000 for fiscal year 2010.
- (2) \$500,000 for fiscal year 2011.
- (3) \$500,000 for fiscal year 2012.

* * * * *

SEC. 10. DEFINITIONS.

In this Act:

(1) * * *

[(2) NANOTECHNOLOGY.—The term “nanotechnology” means the science and technology that will enable one to understand, measure, manipulate, and manufacture at the atomic, molecular, and supramolecular levels, aimed at creating materials, devices, and systems with fundamentally new molecular organization, properties, and functions.]

(2) *NANOTECHNOLOGY.—The term “nanotechnology” means the science and technology that will enable one to understand, measure, manipulate, and manufacture at the nanoscale, aimed at creating materials, devices, and systems with fundamentally new properties or functions.*

* * * * *

(7) *NANOSCALE.—The term “nanoscale” means one or more dimensions of between approximately 1 and 100 nanometers.*

* * * * *

HIGH-PERFORMANCE COMPUTING ACT OF 1991

* * * * *

SEC. 3. PURPOSES.

The purposes of this Act are to help ensure the continued leadership of the United States in [high-performance computing] *networking and information technology* and its applications by—

(1) expanding Federal support for research, development, and application of [high-performance computing] *networking and information technology* in order to—

(A) expand the number of researchers, educators, and students with training in [high-performance computing] *networking and information technology* and access to [high-performance computing] *networking and information technology* resources;

* * * * *

(F) provide for the application of [high-performance computing] *networking and information technology* to Grand Challenges;

* * * * *

(2) improving the interagency planning and coordination of Federal research and development on [high-performance computing and] *networking and information technology* and maximizing the effectiveness of the Federal Government’s [high-performance computing network] *networking and information technology* research and development programs;

* * * * *

SEC. 4. DEFINITIONS.

As used in this Act, the term—

(1) *“cyber-physical systems” means physical or engineered systems whose networking and information technology functions and physical elements are deeply integrated and are actively*

connected to the physical world through sensors, actuators, or other means to perform monitoring and control functions;

[(1)] (2) “Director” means the Director of the Office of Science and Technology Policy;

[(2)] (3) “Grand Challenge” means a fundamental problem in science or engineering, with broad economic and scientific impact, whose solution will require the application of high-performance computing resources and multidisciplinary teams of researchers;

[(3)] (4) “[high-performance computing] *networking and information technology*” means advanced computing, communications, and information technologies, including [supercomputer] *high-end computing* systems, high-capacity and high-speed networks, special purpose and experimental systems, applications and systems software, and the management of large data sets;

[(4)] (5) “Internet” means the international computer network of both Federal and non-Federal interoperable data networks;

[(5)] (6) “Network” means a computer [network referred to as the National Research and Education Network established under section 102;] *network, including advanced computer networks of Federal agencies and departments;*

[(6)] (7) “Program” means the [National High-Performance Computing Program] *networking and information technology research and development program* described in section 101; and

[(7)] (8) “Program Component Areas” means the major subject areas under which related individual projects and activities carried out under the Program are grouped.

* * * * *

TITLE I—[HIGH-PERFORMANCE COMPUTING] NETWORKING AND INFORMATION TECHNOLOGY RESEARCH AND DEVELOPMENT

SEC. 101. NATIONAL [HIGH-PERFORMANCE COMPUTING] NETWORKING AND INFORMATION TECHNOLOGY RESEARCH AND DEVELOPMENT PROGRAM.

(a) [NATIONAL HIGH-PERFORMANCE COMPUTING] *NETWORKING AND INFORMATION TECHNOLOGY RESEARCH AND DEVELOPMENT PROGRAM.*—(1) The President shall implement a [National High-Performance Computing Program] *networking and information technology research and development program*, which shall—

(A) provide for long-term basic and applied research on [high-performance computing, including networking] *networking and information technology;*

(B) provide for research and development on, and demonstration of, technologies to advance the capacity and capabilities of [high-performance] *high-end* computing and networking systems, and related software;

(C) provide for sustained access by the research community throughout the United States to [high-performance] *high-end* computing and networking systems that are among the most advanced in the world in terms of performance in solving sci-

entific and engineering problems, including provision for technical support for users of such systems;

* * * * *

(G) provide for the technical support of, and research and development on, **[high-performance]** *high-end* computing systems and software required to address Grand Challenges;

(H) provide for educating and training additional undergraduate and graduate students in software engineering, computer science, computer and network security, applied mathematics, library and information science, and computational science; **[and]**

(I) provide for improving the security of computing and networking systems, including Federal systems, including providing for research required to establish security standards and practices for these systems**[.];**

(J) provide for increased understanding of the scientific principles of cyber-physical systems and improve the methods available for the design, development, and operation of cyber-physical systems that are characterized by high reliability, safety, and security; and

(K) provide for research and development on human-computer interactions, visualization, and information management.

(2) The Director shall—

(A) establish the goals and priorities for Federal **[high-performance computing]** *networking and information technology* research, **[development, networking,]** *development*, and other activities;

* * * * *

(C) provide for interagency coordination of Federal **[high-performance computing]** *networking and information technology* research, **[development, networking,]** *development*, and other activities undertaken pursuant to the Program;

* * * * *

(E) encourage and monitor the efforts of the agencies participating in the Program to allocate the level of resources and management attention necessary to ensure that the strategic plan under subsection (e) is developed and executed effectively and that the objectives of the Program are met;

[(E)] *(F) develop and maintain a research, development, and deployment roadmap covering all States and regions for the provision of **[high-performance]** high-end computing and networking systems under paragraph (1)(C); and*

[(F)] *(G) consult with academic, State, industry, and other appropriate groups conducting research on and using **[high-performance]** high-end computing.*

(3) The annual report submitted under paragraph (2)(D) shall—

(A) * * *

* * * * *

(C) describe the levels of Federal funding for the fiscal year during which such report **[is submitted,]** *is submitted, the levels for the previous fiscal year*, and the levels proposed for the fiscal year with respect to which the budget submission applies, for **[each Program Component Area,]** *each Program*

Component Area and research area supported in accordance with section 104;

(D) describe the levels of Federal funding for each agency and department participating in the Program, and for **[each Program Component Area,]** *each Program Component Area and research area supported in accordance with section 104*, for the fiscal year during which such report **[is submitted,]** *is submitted, the levels for the previous fiscal year*, and the levels proposed for the fiscal year with respect to which the budget submission applies; **[and]**

(E) *include a description of how the objectives for each Program Component Area, and the objectives for activities that involve multiple Program Component Areas, relate to the objectives of the Program identified in the strategic plan required under subsection (e);*

(F) *include—*

(i) *a description of the funding required by the National Coordination Office to perform the functions specified under section 102(b) for the next fiscal year by category of activity;*

(ii) *a description of the funding required by such Office to perform the functions specified under section 102(b) for the current fiscal year by category of activity; and*

(iii) *the amount of funding provided for such Office for the current fiscal year by each agency participating in the Program; and*

[(E)] (G) include an analysis of the progress made toward achieving the goals and priorities established for the Program and the extent to which the Program incorporates the recommendations of the advisory committee established under subsection (b).

(b) ADVISORY COMMITTEE.—(1) The President shall establish an advisory committee on **[high-performance computing]** *networking and information technology, in which the co-chairs shall be members of the President's Council of Advisors on Science and Technology and with the remainder of the committee* consisting of geographically dispersed non-Federal members, including representatives of the research, education, and library communities, network and related software providers, and industry representatives in the Program Component Areas, who are specially qualified to provide the Director with advice and information on **[high-performance computing]** *networking and information technology*. The recommendations of the advisory committee shall be considered in reviewing and revising the Program. The advisory committee shall provide the Director with an independent assessment of—

(A) * * *

* * * * *

(c) OFFICE OF MANAGEMENT AND BUDGET.—(1) Each Federal agency and department participating in the Program shall, as part of its annual request for appropriations to the Office of Management and Budget, submit a report to the Office of Management and Budget which—

(A) identifies each element of its **[high-performance computing]** *networking and information technology* activities

which contributes directly to the Program Component Areas or benefits from the Program; and

* * * * *

(d) *PERIODIC REVIEWS.*—The agencies identified in subsection (a)(3)(B) shall—

(1) periodically assess the contents and funding levels of the Program Component Areas and restructure the Program when warranted, taking into consideration any relevant recommendations of the advisory committee established under subsection (b); and

(2) ensure that the Program includes large-scale, long-term, interdisciplinary research and development activities, including activities described in section 104.

(e) *STRATEGIC PLAN.*—

(1) *IN GENERAL.*—The agencies identified in subsection (a)(3)(B), working through the National Science and Technology Council and with the assistance of the National Coordination Office established under section 102, shall develop, within 12 months after the date of enactment of the Networking and Information Technology Research and Development Act of 2010, and update every 3 years thereafter, a 5-year strategic plan to guide the activities described under subsection (a)(1).

(2) *CONTENTS.*—The strategic plan shall specify near-term and long-term objectives for the Program, the anticipated time frame for achieving the near-term objectives, the metrics to be used for assessing progress toward the objectives, and how the Program will—

(A) foster the transfer of research and development results into new technologies and applications for the benefit of society, including through cooperation and collaborations with networking and information technology research, development, and technology transition initiatives supported by the States;

(B) encourage and support mechanisms for interdisciplinary research and development in networking and information technology, including through collaborations across agencies, across Program Component Areas, with industry, with Federal laboratories (as defined in section 4 of the Stevenson-Wydler Technology Innovation Act of 1980 (15 U.S.C. 3703)), and with international organizations;

(C) address long-term challenges of national importance for which solutions require large-scale, long-term, interdisciplinary research and development;

(D) place emphasis on innovative and high-risk projects having the potential for substantial societal returns on the research investment;

(E) strengthen all levels of networking and information technology education and training programs to ensure an adequate, well-trained workforce; and

(F) attract more women and underrepresented minorities to pursue postsecondary degrees in networking and information technology.

(3) *NATIONAL RESEARCH INFRASTRUCTURE.*—The strategic plan developed in accordance with paragraph (1) shall be accompanied by milestones and roadmaps for establishing and maintaining the

national research infrastructure required to support the Program, including the roadmap required by subsection (a)(2)(E).

(4) RECOMMENDATIONS.—The entities involved in developing the strategic plan under paragraph (1) shall take into consideration the recommendations—

(A) of the advisory committee established under subsection (b); and

(B) of the stakeholders whose input was solicited by the National Coordination Office, as required under section 102(b)(3).

(5) REPORT TO CONGRESS.—The Director of the National Coordination Office shall transmit the strategic plan required under paragraph (1) to the advisory committee, the Committee on Commerce, Science, and Transportation of the Senate, and the Committee on Science and Technology of the House of Representatives.

【SEC. 102. NATIONAL RESEARCH AND EDUCATION NETWORK.

【(a) ESTABLISHMENT.—As part of the Program, the National Science Foundation, the Department of Defense, the Department of Energy, the Department of Commerce, the National Aeronautics and Space Administration, and other agencies participating in the Program shall support the establishment of the National Research and Education Network, portions of which shall, to the extent technically feasible, be capable of transmitting data at one gigabit per second or greater by 1996. The Network shall provide for the linkage of research institutions and educational institutions, government, and industry in every State.

【(b) ACCESS.—Federal agencies and departments shall work with private network service providers, State and local agencies, libraries, educational institutions and organizations, and others, as appropriate, in order to ensure that the researchers, educators, and students have access, as appropriate, to the Network. The Network is to provide users with appropriate access to high-performance computing systems, electronic information resources, other research facilities, and libraries. The Network shall provide access, to the extent practicable, to electronic information resources maintained by libraries, research facilities, publishers, and affiliated organizations.

【(c) NETWORK CHARACTERISTICS.—The Network shall—

【(1) be developed and deployed with the computer, telecommunications, and information industries;

【(2) be designed, developed, and operated in collaboration with potential users in government, industry, and research institutions and educational institutions;

【(3) be designed, developed, and operated in a manner which fosters and maintains competition and private sector investment in high-speed data networking within the telecommunications industry;

【(4) be designed, developed, and operated in a manner which promotes research and development leading to development of commercial data communications and telecommunications standards, whose development will encourage the establishment of privately operated high-speed commercial networks;

【(5) be designed and operated so as to ensure the continued application of laws that provide network and information resources security measures, including those that protect copy-

right and other intellectual property rights, and those that control access to data bases and protect national security;

[(6) have accounting mechanisms which allow users or groups of users to be charged for their usage of copyrighted materials available over the Network and, where appropriate and technically feasible, for their usage of the Network;

[(7) ensure the interoperability of Federal and non-Federal computer networks, to the extent appropriate, in a way that allows autonomy for each component network;

[(8) be developed by purchasing standard commercial transmission and network services from vendors whenever feasible, and by contracting for customized services when not feasible, in order to minimize Federal investment in network hardware;

[(9) support research and development of networking software and hardware; and

[(10) serve as a test bed for further research and development of high-capacity and high-speed computing networks and demonstrate how advanced computers, high-capacity and high-speed computing networks, and data bases can improve the national information infrastructure.

[(d) DEFENSE ADVANCED RESEARCH PROJECTS AGENCY RESPONSIBILITY.—As part of the Program, the Department of Defense, through the Defense Advanced Research Projects Agency, shall support research and development of advanced fiber optics technology, switches, and protocols needed to develop the Network.

[(e) INFORMATION SERVICES.—The Director shall assist the President in coordinating the activities of appropriate agencies and departments to promote the development of information services that could be provided over the Network. These services may include the provision of directories of the users and services on computer networks, data bases of unclassified Federal scientific data, training of users of data bases and computer networks, access to commercial information services for users of the Network, and technology to support computer-based collaboration that allows researchers and educators around the Nation to share information and instrumentation.

[(f) USE OF GRANT FUNDS.—All Federal agencies and departments are authorized to allow recipients of Federal research grants to use grant moneys to pay for computer networking expenses.

[(g) REPORT TO CONGRESS.—Within one year after the date of enactment of this Act, the Director shall report to the Congress on—

[(1) effective mechanisms for providing operating funds for the maintenance and use of the Network, including user fees, industry support, and continued Federal investment;

[(2) the future operation and evolution of the Network;

[(3) how commercial information service providers could be charged for access to the Network, and how Network users could be charged for such commercial information services;

[(4) the technological feasibility of allowing commercial information service providers to use the Network and other federally funded research networks;

[(5) how to protect the copyrights of material distributed over the Network; and

[(6) appropriate policies to ensure the security of resources available on the Network and to protect the privacy of users of networks.]

SEC. 102. NATIONAL COORDINATION OFFICE.

(a) *ESTABLISHMENT.*—The Director shall establish a National Coordination Office with a Director and full-time staff.

(b) *FUNCTIONS.*—The National Coordination Office shall—

(1) provide technical and administrative support to—

(A) the agencies participating in planning and implementing the Program, including such support as needed in the development of the strategic plan under section 101(e); and

(B) the advisory committee established under section 101(b);

(2) serve as the primary point of contact on Federal networking and information technology activities for government organizations, academia, industry, professional societies, State computing and networking technology programs, interested citizen groups, and others to exchange technical and programmatic information;

(3) solicit input and recommendations from a wide range of stakeholders during the development of each strategic plan required under section 101(e) through the convening of at least 1 workshop with invitees from academia, industry, Federal laboratories, and other relevant organizations and institutions;

(4) conduct public outreach, including the dissemination of findings and recommendations of the advisory committee, as appropriate; and

(5) promote access to and early application of the technologies, innovations, and expertise derived from Program activities to agency missions and systems across the Federal Government and to United States industry.

(c) *SOURCE OF FUNDING.*—

(1) *IN GENERAL.*—The operation of the National Coordination Office shall be supported by funds from each agency participating in the Program.

(2) *SPECIFICATIONS.*—The portion of the total budget of such Office that is provided by each agency for each fiscal year shall be in the same proportion as each such agency's share of the total budget for the Program for the previous fiscal year, as specified in the report required under section 101(a)(3).

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SEC. 104. LARGE-SCALE RESEARCH IN AREAS OF NATIONAL IMPORTANCE.

(a) *IN GENERAL.*—The Program shall encourage agencies identified in section 101(a)(3)(B) to support large-scale, long-term, interdisciplinary research and development activities in networking and information technology directed toward application areas that have the potential for significant contributions to national economic competitiveness and for other significant societal benefits. Such activities, ranging from basic research to the demonstration of technical solutions, shall be designed to advance the development of research discoveries. The advisory committee established under section 101(b)

shall make recommendations to the Program for candidate research and development areas for support under this section.

(b) **CHARACTERISTICS.**—

(1) **IN GENERAL.**—Research and development activities under this section shall—

(A) include projects selected on the basis of applications for support through a competitive, merit-based process;

(B) involve collaborations among researchers in institutions of higher education and industry, and may involve nonprofit research institutions and Federal laboratories, as appropriate;

(C) when possible, leverage Federal investments through collaboration with related State initiatives; and

(D) include a plan for fostering the transfer of research discoveries and the results of technology demonstration activities, including from institutions of higher education and Federal laboratories, to industry for commercial development.

(2) **COST-SHARING.**—In selecting applications for support, the agencies shall give special consideration to projects that include cost sharing from non-Federal sources.

(3) **AGENCY COLLABORATION.**—If 2 or more agencies identified in section 101(a)(3)(B), or other appropriate agencies, are working on large-scale research and development activities in the same area of national importance, then such agencies shall strive to collaborate through joint solicitation and selection of applications for support and subsequent funding of projects.

(4) **INTERDISCIPLINARY RESEARCH CENTERS.**—Research and development activities under this section may be supported through interdisciplinary research centers that are organized to investigate basic research questions and carry out technology demonstration activities in areas described in subsection (a). Research may be carried out through existing interdisciplinary centers, including those authorized under section 7024(b)(2) of the America COMPETES Act (Public Law 110–69; 42 U.S.C. 1862o–10).

SEC. 105. UNIVERSITY/INDUSTRY TASK FORCE.

(a) **ESTABLISHMENT.**—Not later than 180 days after the date of enactment of the Networking and Information Technology Research and Development Act of 2010, the Director of the National Coordination Office established under section 102 shall convene a task force to explore mechanisms for carrying out collaborative research and development activities for cyber-physical systems, including the related technologies required to enable these systems, through a consortium or other appropriate entity with participants from institutions of higher education, Federal laboratories, and industry.

(b) **FUNCTIONS.**—The task force shall—

(1) develop options for a collaborative model and an organizational structure for such entity under which the joint research and development activities could be planned, managed, and conducted effectively, including mechanisms for the allocation of resources among the participants in such entity for support of such activities;

(2) propose a process for developing a research and development agenda for such entity, including objectives and milestones;

(3) define the roles and responsibilities for the participants from institutions of higher education, Federal laboratories, and industry in such entity;

(4) propose guidelines for assigning intellectual property rights and for the transfer of research results to the private sector; and

(5) make recommendations for how such entity could be funded from Federal, State, and non-governmental sources.

(c) COMPOSITION.—In establishing the task force under subsection (a), the Director of the National Coordination Office shall appoint an equal number of individuals from institutions of higher education and from industry with knowledge and expertise in cyber-physical systems, of which 2 may be selected from Federal laboratories.

(d) REPORT.—Not later than 1 year after the date of enactment of the Networking and Information Technology Research and Development Act of 2010, the Director of the National Coordination Office shall transmit to the Committee on Commerce, Science, and Transportation of the Senate and the Committee on Science and Technology of the House of Representatives a report describing the findings and recommendations of the task force.

TITLE II—AGENCY ACTIVITIES

SEC. 201. NATIONAL SCIENCE FOUNDATION ACTIVITIES.

(a) GENERAL RESPONSIBILITIES.—As part of the Program described in title I—

(1) the National Science Foundation shall provide computing and networking infrastructure support for all science and engineering disciplines, and support basic research and human resource development in all aspects of [high-performance computing and advanced high-speed computer networking;] *networking and information research and development*;

(2) *the National Science Foundation shall use its existing programs, in collaboration with other agencies, as appropriate, to improve the teaching and learning of networking and information technology at all levels of education and to increase participation in networking and information technology fields, including by women and underrepresented minorities*;

[(2)] (3) to the extent that colleges, universities, and libraries cannot connect to the Network with the assistance of the private sector, the National Science Foundation shall have primary responsibility for assisting colleges, universities, and libraries to connect to the Network;

[(3)] (4) the National Science Foundation shall serve as the primary source of information on access to and use of the Network; and

[(4)] (5) the National Science Foundation shall upgrade the National Science Foundation funded network, assist regional networks to upgrade their capabilities, and provide other Fed-

eral departments and agencies the opportunity to connect to the National Science Foundation funded network.

* * * * *

SEC. 202. NATIONAL AERONAUTICS AND SPACE ADMINISTRATION ACTIVITIES.

(a) GENERAL RESPONSIBILITIES.—As part of the Program described in title I, the National Aeronautics and Space Administration shall conduct basic and applied research in [high-performance computing] *networking and information technology*, particularly in the field of computational science, with emphasis on aerospace sciences, earth and space sciences, and remote exploration and experimentation.

* * * * *

SEC. 203. DEPARTMENT OF ENERGY ACTIVITIES.

(a) GENERAL RESPONSIBILITIES.—As part of the Program described in title I, the Secretary of Energy shall—

(1) conduct and support basic and applied research in [high-performance computing and networking] *networking and information technology* to support fundamental research in science and engineering disciplines related to energy applications; and

* * * * *

SEC. 204. DEPARTMENT OF COMMERCE ACTIVITIES.

(a) GENERAL RESPONSIBILITIES.—As part of the Program described in title I—

(1) the National Institute of Standards and Technology shall—

(A) conduct basic and applied measurement research needed to support various [high-performance computing systems and networks] *networking and information technology systems and capabilities*;

* * * * *

(C) be responsible for developing benchmark tests and standards for [high-performance computing] *networking and information technology* systems and software; and

* * * * *

SEC. 205. ENVIRONMENTAL PROTECTION AGENCY ACTIVITIES.

(a) GENERAL RESPONSIBILITIES.—As part of the Program described in title I, the Environmental Protection Agency shall conduct basic and applied research directed toward the advancement and dissemination of [computational] *networking and information technology* techniques and software tools which form the core of ecosystem, atmospheric chemistry, and atmospheric dynamics models.

* * * * *

SEC. 206. ROLE OF THE DEPARTMENT OF EDUCATION.

(a) GENERAL RESPONSIBILITIES.—As part of the Program described in title I, the Secretary of Education is authorized to conduct basic and applied research in [computational research] *networking and information technology research* with an emphasis on the coordination of activities with libraries, school facilities, and

education research groups with respect to the advancement and dissemination of computational science and the development, evaluation and application of software capabilities.

* * * * *

SEC. 208. FOSTERING UNITED STATES COMPETITIVENESS IN [HIGH-PERFORMANCE COMPUTING] NETWORKING AND INFORMATION TECHNOLOGY AND RELATED ACTIVITIES.

(a) FINDINGS.—The Congress finds the following:

(1) [High-performance computing and associated] *Networking and information* technologies are critical to the United States economy.

(2) While the United States has led the development of [high-performance computing] *networking and information technologies*, United States industry is facing increasing global competition.

* * * * *

(4) It is appropriate for Federal agencies and departments to use the funds authorized for the Program in a manner which most effectively fosters the maintenance and development of United States leadership in [high-performance computers and associated] *networking and information* technologies in and for the benefit of the United States.

(5) It is appropriate for Federal agencies and departments to use the funds authorized for the Program in a manner, consistent with the Trade Agreements Act of 1979 (19 U.S.C. 2501 et seq.), which most effectively fosters reciprocal competitive procurement treatment by foreign governments for United States [high-performance computing and associated] *networking and information* technology products and suppliers.

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NATIONAL SCIENCE FOUNDATION ACT OF 1950

* * * * *

NATIONAL SCIENCE BOARD

SEC. 4. (a) * * *

* * * * *

(g) The Board may, with the concurrence of a majority of its members, permit the appointment of a staff consisting of [not more than 5] professional staff members, technical and professional personnel on leave of absence from academic, industrial, or research institutions for a limited term, and such operations and support staff members as may be necessary. Such staff shall be appointed by the Chairman and assigned at the direction of the Board. The professional members and limited term technical and professional personnel of such staff may be appointed without regard to the provisions of title 5, United States Code, governing appointments in the competitive service, and the provisions of chapter 51 of such title relating to classification, and shall be compensated at a rate not exceeding the maximum rate payable under section 5376 of such title, as may be necessary to provide for the performance of

such duties as may be prescribed by the Board in connection with the exercise of its powers and functions under this Act. Section 14(a)(3) shall apply to each limited term appointment of technical and professional personnel under this subsection. Each appointment under this subsection shall be subject to the same security requirements as those required for personnel of the Foundation appointed under section 14(a).

* * * * *

(j)(1) The Board shall render to the President and the Congress no later than ~~January 15~~ *May 31* of each even numbered year, a report on indicators of the state of science and engineering in the United States.

(2) The Board shall render to the President and the Congress reports on specific, individual policy matters *within the authority of the Foundation (or otherwise as requested by the appropriate Congressional committees of jurisdiction or the President)* related to science and engineering and education in science and engineering, as the Board, the President, or the Congress determines the need for such reports.

* * * * *

SCHOLARSHIPS AND GRADUATE FELLOWSHIPS

SEC. 10. (a) The Foundation is authorized to award scholarships and graduate fellowships for study and research in the sciences or in engineering at appropriate nonprofit American or nonprofit foreign institutions selected by the recipient of such aid, for stated periods of time. Persons shall be selected for such scholarships and fellowships from among citizens, nationals or lawfully admitted permanent resident aliens of the United States, and such selections shall be made solely on the basis of ability; but in any case in which two or more applicants for scholarships or fellowships, as the case may be, are deemed by the Foundation to be possessed of substantially equal ability, and there are not sufficient scholarships or fellowships, as the case may be, available to grant one to each of such applicants, the available scholarship or scholarships, fellowship or fellowships shall be awarded to the applicants in such manner as will tend to result in a wide distribution of scholarships and fellowships throughout the United States. Nothing contained in this Act shall prohibit the Foundation from refusing or revoking a scholarship or fellowship award, in whole or in part, in the case of any applicant or recipient, if the Board is of the opinion that such award is not in the best interests of the United States.

(b) *The Director shall establish for each year the amount to be awarded for scholarships and fellowships under this section for that year. Each such scholarship and fellowship shall include a cost of education allowance of \$12,000, subject to any restrictions on the use of cost of education allowance as determined by the Director.*

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**NATIONAL SCIENCE FOUNDATION AUTHORIZATION ACT
OF 2002**

* * * * *

SEC. 10A. NATIONAL SCIENCE FOUNDATION TEACHING FELLOWSHIPS AND MASTER TEACHING FELLOWSHIPS.

(a) * * *

* * * * *

(h) MATCHING REQUIREMENT.—

(1) IN GENERAL.—An eligible entity receiving a grant under this section shall provide, from non-Federal sources, an amount equal to **[50]** 30 percent of the amount of the grant **([which may be provided in cash or in-kind] which shall be provided in cash)** to carry out the activities supported by the grant.

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SEC. 15. ADMINISTRATIVE AMENDMENTS.

(a) BOARD MEETINGS.—

(1) * * *

* * * * *

[(3) COMPLIANCE AUDIT.—The Inspector General of the Foundation shall conduct an audit every three years of the compliance by the Board with the requirements described in paragraph (2). The audit shall examine the proposed and actual content of closed meetings and determine whether the closure of the meetings was consistent with section 552b of title 5, United States Code.]

[(4) (3) REPORT.—Not later than **[February 15] *April 15* of every third year, the Inspector General of the Foundation shall transmit to the Committee on Science of the House of Representatives, the Committee on Commerce, Science, and Transportation of the Senate, and the Committee on Health, Education, Labor, and Pensions of the Senate **[the audit required under paragraph (3) along with] any** recommendations for corrective actions that need to be taken to achieve fuller compliance with the requirements described in paragraph (2), and recommendations on how to ensure public access to the Board's deliberations.**

[(5) (4) MATERIALS RELATING TO CLOSED PORTIONS OF MEETINGS.—[To facilitate the audit required under paragraph (3) of this subsection, the]** *The* Office of the National Science Board shall maintain the General Counsel's certificate, the presiding officer's statement, and a transcript or recording of any closed meeting, for at least 3 years after such meeting.**

* * * * *

[SEC. 17. UNDERGRADUATE EDUCATION REFORM.

[(a) IN GENERAL.—The Director shall award grants, on a competitive, merit-reviewed basis, to institutions of higher education to expand previously implemented reforms of undergraduate science, mathematics, engineering, or technology education that have been demonstrated to have been successful in increasing the number and quality of students studying toward and completing associate's or baccalaureate degrees in science, mathematics, engineering, or technology.

[(b) USES OF FUNDS.—Activities supported by grants under this section may include—

【(1) expansion of successful reform efforts beyond a single course or group of courses to achieve reform within an entire academic unit;

【(2) expansion of successful reform efforts beyond a single academic unit to other science, mathematics, engineering, or technology academic units within an institution;

【(3) creation of multidisciplinary courses or programs that formalize collaborations for the purpose of improved student instruction and research in science, mathematics, engineering, and technology;

【(4) expansion of undergraduate research opportunities beyond a particular laboratory, course, or academic unit to engage multiple academic units in providing multidisciplinary research opportunities for undergraduate students;

【(5) expansion of innovative tutoring or mentoring programs proven to enhance student recruitment or persistence to degree completion in science, mathematics, engineering, or technology;

【(6) improvement of undergraduate science, mathematics, engineering, and technology education for nonmajors, including education majors; and

【(7) implementation of technology-driven reform efforts, including the installation of technology to facilitate such reform, that directly impact undergraduate science, mathematics, engineering, or technology instruction or research experiences.

【(c) SELECTION PROCESS.—

【(1) APPLICATIONS.—An institution of higher education seeking a grant under this section shall submit an application to the Director at such time, in such manner, and containing such information as the Director may require. The application shall include, at a minimum—

【(A) a description of the proposed reform effort;

【(B) a description of the previously implemented reform effort that will serve as the basis for the proposed reform effort and evidence of success of that previous effort, including data on student recruitment, persistence to degree completion, and academic achievement;

【(C) evidence of active participation in the proposed project by individuals who were central to the success of the previously implemented reform effort; and

【(D) evidence of institutional support for, and commitment to, the proposed reform effort, including a description of existing or planned institutional policies and practices regarding faculty hiring, promotion, tenure, and teaching assignment that reward faculty contributions to undergraduate education equal to, or greater than, scholarly scientific research.

【(2) REVIEW OF APPLICATIONS.—In evaluating applications submitted under paragraph (1), the Director shall consider at a minimum—

【(A) the evidence of past success in implementing undergraduate education reform and the likelihood of success in undertaking the proposed expanded effort;

【(B) the extent to which the faculty, staff, and administrators of the institution are committed to making the pro-

posed institutional reform a priority of the participating academic unit;

【(C) the degree to which the proposed reform will contribute to change in institutional culture and policy such that a greater value is placed on faculty engagement in undergraduate education, as evidenced through promotion and tenure policies; and

【(D) the likelihood that the institution will sustain or expand the reform beyond the period of the grant.

【(3) GRANT DISTRIBUTION.—The Director shall ensure, to the extent practicable, that grants awarded under this section are made to a variety of types of institutions of higher education.】

SEC. 17. TRANSFORMING UNDERGRADUATE EDUCATION IN STEM.

(a) *IN GENERAL.*—*The Director shall award grants, on a competitive, merit-reviewed basis, to institutions of higher education (or to consortia thereof) to reform undergraduate STEM education for the purpose of increasing the number and quality of students studying toward and completing baccalaureate degrees in STEM and improving the STEM learning outcomes for all undergraduate students, including through—*

(1) *development, implementation, and assessment of innovative, research-based approaches to transforming the teaching and learning of disciplinary or interdisciplinary STEM at the undergraduate level; and*

(2) *expansion of successful STEM reform efforts beyond a single course or group of courses to achieve reform within an entire academic unit, or expansion of successful reform efforts beyond a single academic unit to other STEM academic units within an institution or to comparable academic units at other institutions.*

(b) *USES OF FUNDS.*—*Activities supported by grants under this section may include—*

(1) *creation of multidisciplinary or interdisciplinary courses or programs that formalize collaborations for the purpose of improved student instruction and research in STEM;*

(2) *expansion of undergraduate STEM research opportunities to include interdisciplinary research opportunities and research opportunities in industry, at Federal labs, and at international research institutions or research sites;*

(3) *implementation or expansion of bridge programs, including programs that address student transition from 2-year to 4-year institutions, and cohort, tutoring, or mentoring programs proven to enhance student recruitment or persistence to degree completion in STEM, including recruitment or persistence to degree completion of individuals identified in section 33 or 34 of the Science and Engineering Equal Opportunities Act (42 U.S.C. 1885a or 1885b);*

(4) *improvement of undergraduate STEM education for non-majors, including education majors;*

(5) *implementation of evidence-based, technology-driven reform efforts that directly impact undergraduate STEM instruction or research experiences;*

(6) *development and implementation of faculty and graduate teaching assistant development programs focused on improved*

instruction, mentoring, assessment of student learning, and support of undergraduate STEM students;

(7) support for graduate students and postdoctoral fellows to participate in instructional or assessment activities at primarily undergraduate institutions;

(8) research on teaching and learning of STEM at the undergraduate level related to the proposed reform effort, including assessment and evaluation of the proposed reform activities, research on scalability and sustainability of approaches to reform, and development and implementation of longitudinal studies of students included in the proposed reform effort; and

(9) support for initiatives that advance the integration of global challenges such as sustainability into disciplinary and interdisciplinary STEM education.

(c) PARTNERSHIP.—An institution of higher education may partner with one or more other nonprofit education or research organizations, including scientific and engineering societies, for the purposes of carrying out the activities authorized under this section.

(d) SELECTION PROCESS.—

(1) APPLICATIONS.—An institution of higher education seeking a grant under this section shall submit an application to the Director at such time, in such manner, and containing such information as the Director may require. The application shall include, at a minimum—

(A) a description of the proposed reform effort;

(B) a description of the research findings that will serve as the basis for the proposed reform effort or, in the case of applications that propose an expansion of a previously implemented reform effort, a description of the previously implemented reform effort, including indicators of success such as data on student recruitment, persistence to degree completion, and academic achievement;

(C) evidence of institutional support for, and commitment to, the proposed reform effort, including long-term commitment to implement successful strategies from the current reform effort beyond the academic unit or units included in the grant proposal or to disseminate successful strategies to other institutions;

(D) a description of existing or planned institutional policies and practices regarding faculty hiring, promotion, tenure, and teaching assignment that reward faculty contributions to undergraduate STEM education; and

(E) a description of the plans for assessment and evaluation of the proposed reform activities, including evidence of participation by individuals with experience in assessment and evaluation of teaching and learning programs.

(2) REVIEW OF APPLICATIONS.—In selecting grant recipients under this section, the Director shall consider at a minimum—

(A) the likelihood of success in undertaking the proposed effort at the institution submitting the application, including the extent to which the faculty, staff, and administrators of the institution are committed to making the proposed institutional reform a priority of the participating academic unit or units;

(B) the degree to which the proposed reform will contribute to change in institutional culture and policy such that a greater value is placed on faculty engagement in undergraduate education;

(C) the likelihood that the institution will sustain or expand the reform beyond the period of the grant; and

(D) the degree to which scholarly assessment and evaluation plans are included in the design of the reform effort, including the degree to which such assessment and evaluation contribute to the systematic accumulation of knowledge on STEM education.

(3) *PRIORITY.*—For proposals that include an expansion of existing reform efforts beyond a single academic unit, the Director shall give priority to proposals for which a senior institutional administrator, including a dean or other administrator of equal or higher rank, serves as the principal investigator or a coprincipal investigator.

(4) *GRANT DISTRIBUTION.*—The Director shall ensure, to the extent practicable, that grants awarded under this section are made to a variety of types of institutions of higher education.

* * * * *

AMERICA COMPETES ACT

SECTION 1. SHORT TITLE.

This Act may be cited as the “America COMPETES Act” or the “America Creating Opportunities to Meaningfully Promote Excellence in Technology, Education, and Science Act”.

SEC. 2. TABLE OF CONTENTS.

The table of contents of this Act is as follows:

Sec. 1. Short title.

* * * * *

TITLE V—DEPARTMENT OF ENERGY

* * * * *

【Sec. 5004. Nuclear science talent expansion program for institutions of higher education.

【Sec. 5005. Hydrocarbon systems science talent expansion program for institutions of higher education.】

Sec. 5004. *Energy applied science talent expansion program for institutions of higher education.*

* * * * *

TITLE V—DEPARTMENT OF ENERGY

* * * * *

SEC. 5002. DEFINITIONS.

In this title:

(1) * * *

(2) *ENERGY SYSTEMS SCIENCE AND ENGINEERING.*—The term “energy systems science and engineering” means—

(A) nuclear science and engineering, including—

(i) nuclear engineering;

(ii) nuclear chemistry;

- (iii) radiochemistry; and
- (iv) health physics;
- (B) hydrocarbon system science and engineering, including—
 - (i) petroleum or reservoir engineering;
 - (ii) environmental geoscience;
 - (iii) petrophysics;
 - (iv) geophysics;
 - (v) geochemistry;
 - (vi) petroleum geology;
 - (vii) ocean engineering;
 - (viii) environmental engineering; and
 - (ix) carbon capture and sequestration science and engineering;
- (C) energy efficiency and renewable energy technology systems science and engineering, including with respect to—
 - (i) solar technology systems;
 - (ii) wind technology systems;
 - (iii) buildings technology systems;
 - (iv) transportation technology systems;
 - (v) hydropower systems; and
 - (vi) geothermal systems; and
- (D) energy storage and distribution systems science and engineering, including with respect to—
 - (i) energy storage; and
 - (ii) energy delivery.

[(2)] (3) INSTITUTION OF HIGHER EDUCATION.—The term “institution of higher education” has the meaning given the term in section 101(a) of the Higher Education Act of 1965 (20 U.S.C. 1001(a)).

[(3)] (4) NATIONAL LABORATORY.—The term “National Laboratory” has the meaning given the term in section 2 of the Energy Policy Act of 2005 (42 U.S.C. 15801).

[(4)] (5) SECRETARY.—The term “Secretary” means the Secretary of Energy.

* * * * *

[SEC. 5004. NUCLEAR SCIENCE TALENT EXPANSION PROGRAM FOR INSTITUTIONS OF HIGHER EDUCATION.

[(a)] PURPOSES.—The purposes of this section are—

[(1)] to address the decline in the number of and resources available to nuclear science programs at institutions of higher education; and

[(2)] to increase the number of graduates with degrees in nuclear science, an area of strategic importance to the economic competitiveness and energy security of the United States.

[(b)] DEFINITION OF NUCLEAR SCIENCE.—In this section, the term “nuclear science” includes—

- [(1)] nuclear science;
- [(2)] nuclear engineering;
- [(3)] nuclear chemistry;
- [(4)] radio chemistry; and
- [(5)] health physics.

[(c) ESTABLISHMENT.—The Secretary shall establish, in accordance with this section, a program to expand and enhance institution of higher education nuclear science educational capabilities.

[(d) NUCLEAR SCIENCE PROGRAM EXPANSION GRANTS FOR INSTITUTIONS OF HIGHER EDUCATION.—

[(1) IN GENERAL.—The Secretary shall award up to 3 competitive grants for each fiscal year to institutions of higher education that establish new academic degree programs in nuclear science.

[(2) PRIORITY.—In evaluating grants under this subsection, the Secretary shall give priority to proposals that involve partnerships with a National Laboratory or other eligible nuclear-related entity, as determined by the Secretary.

[(3) CRITERIA.—Criteria for a grant awarded under this subsection shall be based on—

[(A) the potential to attract new students to the program;

[(B) academic rigor; and

[(C) the ability to offer hands-on learning opportunities.

[(4) DURATION AND AMOUNT.—

[(A) DURATION.—A grant under this subsection may be up to 5 years in duration.

[(B) AMOUNT.—An institution of higher education that receives a grant under this subsection shall be eligible for up to \$1,000,000 for each year of the grant period.

[(5) USE OF FUNDS.—An institution of higher education that receives a grant under this subsection may use the grant to—

[(A) recruit and retain new faculty;

[(B) develop core and specialized course content;

[(C) encourage collaboration between faculty and researchers in the nuclear science field; and

[(D) support outreach efforts to recruit students.

[(e) NUCLEAR SCIENCE COMPETITIVENESS GRANTS FOR INSTITUTIONS OF HIGHER EDUCATION.—

[(1) IN GENERAL.—The Secretary shall award up to 5 competitive grants for each fiscal year to institutions of higher education with existing academic degree programs that produce graduates in nuclear science.

[(2) CRITERIA.—Criteria for a grant awarded under this subsection shall be based on the potential for increasing the number and academic quality of graduates in the nuclear sciences who enter into careers in nuclear-related fields.

[(3) DURATION AND AMOUNT.—

[(A) DURATION.—A grant under this subsection may be up to 5 years in duration.

[(B) AMOUNT.—An institution of higher education that receives a grant under this subsection shall be eligible for up to \$500,000 for each year of the grant period.

[(4) USE OF FUNDS.—An institution of higher education that receives a grant under this subsection may use the grant to—

[(A) increase the number of graduates in nuclear science that enter into careers in the nuclear science field;

[(B) enhance the teaching of advanced nuclear technologies;

[(C) aggressively pursue collaboration opportunities with industry and National Laboratories;

[(D) bolster or sustain nuclear infrastructure and research facilities of the institution of higher education, such as research and training reactors or laboratories; and

[(E) provide tuition assistance and stipends to undergraduate and graduate students.

[(f) AUTHORIZATION OF APPROPRIATIONS.—

[(1) NUCLEAR SCIENCE PROGRAM EXPANSION GRANTS FOR INSTITUTIONS OF HIGHER EDUCATION.—There are authorized to be appropriated to carry out subsection (d)—

[(A) \$3,500,000 for fiscal year 2008;

[(B) \$6,500,000 for fiscal year 2009; and

[(C) \$9,500,000 for fiscal year 2010.

[(2) NUCLEAR SCIENCE COMPETITIVENESS GRANTS FOR INSTITUTIONS OF HIGHER EDUCATION.—There are authorized to be appropriated to carry out subsection (e)—

[(A) \$3,000,000 for fiscal year 2008;

[(B) \$5,500,000 for fiscal year 2009; and

[(C) \$8,000,000 for fiscal year 2010.

[SEC. 5005. HYDROCARBON SYSTEMS SCIENCE TALENT EXPANSION PROGRAM FOR INSTITUTIONS OF HIGHER EDUCATION.

[(a) PURPOSES.—The purposes of this section are—

[(1) to address the decline in the number of and resources available to hydrocarbon systems science programs at institutions of higher education; and

[(2) to increase the number of graduates with degrees in hydrocarbon systems science, an area of strategic importance to the economic competitiveness and energy security of the United States.

[(b) DEFINITION OF HYDROCARBON SYSTEMS SCIENCE.—In this section:

[(1) IN GENERAL.—The term “hydrocarbon systems science” means a science involving natural gas or other petroleum exploration, development, or production.

[(2) INCLUSIONS.—The term “hydrocarbon systems science” includes—

[(A) petroleum or reservoir engineering;

[(B) environmental geoscience;

[(C) petrophysics;

[(D) geophysics;

[(E) geochemistry;

[(F) petroleum geology;

[(G) ocean engineering;

[(H) environmental engineering; and

[(I) computer science, as computer science relates to a science described in this subsection.

[(c) ESTABLISHMENT.—The Secretary shall establish, in accordance with this section, a program to expand and enhance institution of higher education hydrocarbon systems science educational capabilities.

[(d) HYDROCARBON SYSTEMS SCIENCE PROGRAM EXPANSION GRANTS FOR INSTITUTIONS OF HIGHER EDUCATION.—

[(1) IN GENERAL.—The Secretary shall award up to 3 competitive grants for each fiscal year to institutions of higher edu-

cation that establish new academic degree programs in hydrocarbon systems science.

[(2) ELIGIBILITY.—In evaluating grants under this subsection, the Secretary shall give priority to proposals that involve partnerships with the National Laboratories, including the National Energy Technology Laboratory, or other hydrocarbon systems scientific entities, as determined by the Secretary.

[(3) CRITERIA.—Criteria for a grant awarded under this subsection shall be based on—

[(A) the potential to attract new students to the program;

[(B) academic rigor; and

[(C) the ability to offer hands-on learning opportunities.

[(4) DURATION AND AMOUNT.—

[(A) DURATION.—A grant under this subsection may be up to 5 years in duration.

[(B) AMOUNT.—An institution of higher education that receives a grant under this subsection shall be eligible for up to \$1,000,000 for each year of the grant period.

[(5) USE OF FUNDS.—An institution of higher education that receives a grant under this subsection may use the grant to—

[(A) recruit and retain new faculty;

[(B) develop core and specialized course content;

[(C) encourage collaboration between faculty and researchers in the hydrocarbon systems science field; and

[(D) support outreach efforts to recruit students.

[(e) HYDROCARBON SYSTEMS SCIENCE COMPETITIVENESS GRANTS FOR INSTITUTIONS OF HIGHER EDUCATION.—

[(1) IN GENERAL.—The Secretary shall award up to 5 competitive grants for each fiscal year to institutions of higher education with existing academic degree programs that produce graduates in hydrocarbon systems science.

[(2) CRITERIA.—Criteria for a grant awarded under this subsection shall be based on the potential for increasing the number and academic quality of graduates in hydrocarbon systems sciences who enter into careers in natural gas and other petroleum exploration, development, and production related fields.

[(3) DURATION AND AMOUNT.—

[(A) DURATION.—A grant under this subsection may be up to 5 years in duration.

[(B) AMOUNT.—An institution of higher education that receives a grant under this subsection shall be eligible for up to \$500,000 for each year of the grant period.

[(4) USE OF FUNDS.—An institution of higher education that receives a grant under this subsection may use the grant to—

[(A) increase the number of graduates in the hydrocarbon systems sciences that enter into careers in the natural gas and other petroleum exploration, development, and production science fields;

[(B) enhance the teaching of advanced natural gas and other petroleum exploration, development, and production technologies;

[(C) aggressively pursue collaboration opportunities with industry and the National Laboratories, including the National Energy Technology Laboratory;

[(D) bolster or sustain natural gas and other petroleum exploration, development, and production infrastructure and research facilities of the institution of higher education, such as research and training or laboratories; and

[(E) provide tuition assistance and stipends to undergraduate and graduate students.

[(f) AUTHORIZATION OF APPROPRIATIONS.—

[(1) HYDROCARBON SYSTEMS SCIENCE PROGRAM EXPANSION GRANTS FOR INSTITUTIONS OF HIGHER EDUCATION.—There are authorized to be appropriated to carry out subsection (d)—

[(A) \$3,500,000 for fiscal year 2008;

[(B) \$6,500,000 for fiscal year 2009; and

[(C) \$9,500,000 for fiscal year 2010.

[(2) HYDROCARBON SYSTEMS SCIENCE COMPETITIVENESS GRANTS FOR INSTITUTIONS OF HIGHER EDUCATION.—There are authorized to be appropriated to carry out subsection (e)—

[(A) \$3,000,000 for fiscal year 2008;

[(B) \$5,500,000 for fiscal year 2009; and

[(C) \$8,000,000 for fiscal year 2010.]

SEC. 5004. ENERGY APPLIED SCIENCE TALENT EXPANSION PROGRAM FOR INSTITUTIONS OF HIGHER EDUCATION.

(a) *PURPOSES.*—*The purposes of this section are—*

(1) *to address the decline in the number of and resources available to energy systems science and engineering programs at institutions of higher education, including community colleges; and*

(2) *to increase the number of graduates with degrees in energy systems science and engineering, an area of strategic importance to the economic competitiveness and energy security of the United States.*

(b) *ESTABLISHMENT.*—*The Secretary shall award grants, on a competitive, merit-reviewed basis, to institutions of higher education to implement or expand the energy systems science and engineering educational and technical training capabilities of the institution, and to provide merit-based financial support for master's and doctoral level students pursuing courses of study and research in energy systems sciences and engineering.*

(c) *USE OF FUNDS.*—*An institution of higher education that receives a grant under this section may use the grant to—*

(1) *provide traineeships, including stipends and cost of education allowances, to master's and doctoral students;*

(2) *develop or expand multidisciplinary or interdisciplinary courses or programs;*

(3) *recruit and retain new faculty;*

(4) *develop or improve core and specialized course content;*

(5) *encourage interdisciplinary and multidisciplinary research collaborations;*

(6) *support outreach efforts to recruit students, including individuals identified in section 33 or 34 of the Science and Engineering Equal Opportunities Act (42 U.S.C. 1885a or 1885b); and*

(7) pursue opportunities for collaboration with industry and National Laboratories.

(d) CRITERIA.—Criteria for awarding a grant under this section shall be based on—

- (1) the potential to attract new students to the program;
- (2) academic rigor; and
- (3) the ability to offer hands-on education and training opportunities for graduate students in the emerging areas of energy systems science and engineering.

(e) PRIORITY.—The Secretary shall give priority to proposals that involve active partnerships with a National Laboratory or other energy systems science and engineering related entity, as determined by the Secretary.

(f) DURATION AND AMOUNT.—

(1) DURATION.—A grant under this section may be for up to 5 years in duration.

(2) AMOUNT.—An institution of higher education that receives a grant under this section shall be eligible for up to \$1,000,000 for each year of the grant period.

(g) AUTHORIZATION OF APPROPRIATIONS.—There are authorized to be appropriated to the Secretary to carry out this section—

- (1) \$30,000,000 for fiscal year 2011;
- (2) \$32,000,000 for fiscal year 2012;
- (3) \$36,000,000 for fiscal year 2013;
- (4) \$38,000,000 for fiscal year 2014; and
- (5) \$40,000,000 for fiscal year 2015.

SEC. 5006. DEPARTMENT OF ENERGY EARLY CAREER AWARDS FOR SCIENCE, ENGINEERING, AND MATHEMATICS RESEARCHERS.

(a) GRANT AWARDS.—The [Director of the Office of Science of the Department (referred to in this section as the “Director”) shall carry] Secretary shall carry out a program to award grants to scientists and engineers at an early career stage at institutions of higher education and organizations described in subsection (c) to conduct research in fields relevant to the mission of the Department.

(b) AMOUNT AND DURATION.—

(1) AMOUNT.—The amount of a grant awarded under this section shall be—

- (A) not less than \$80,000 per year; and
- (B) not more than [\$125,000] \$175,000 per year.

* * * * *

(c) ELIGIBILITY.—

(1) IN GENERAL.—To be eligible to receive a grant under this section, an individual shall[, as determined by the Director]—

(A) * * *

* * * * *

(2) WAIVER.—Notwithstanding paragraph (1)(A), the [Director] Secretary may determine that an individual who has completed a doctorate more than 10 years before the date of submission of a proposal under subsection (e)(1) is eligible to receive a grant under this section if the individual was unable to conduct research for a period of time because of extenuating

circumstances, including military service or family responsibilities, as determined by the [Director] Secretary.

(d) SELECTION.—Grant recipients shall be selected on a competitive, [merit-reviewed] *merit-based, peer reviewed* basis.

(e) SELECTION PROCESS AND CRITERIA.—

(1) PROPOSAL.—To be eligible to receive a grant under this section, an individual shall submit to the [Director] Secretary a proposal at such time, in such manner, and containing such information as the [Director] Secretary may require.

(2) EVALUATION.—In evaluating the proposals submitted under paragraph (1), the [Director] Secretary shall take into consideration, at a minimum—

(A) * * *

* * * * *

(f) DIVERSITY REQUIREMENT.—

(1) IN GENERAL.—In awarding grants under this section, the [Director] Secretary shall endeavor to ensure that the grant recipients represent a variety of types of institutions of higher education and nonprofit, nondegree-granting research organizations.

(2) REQUIREMENT.—In support of the goal described in paragraph (1), the [Director] Secretary shall broadly disseminate information regarding the deadlines applicable to, and manner in which to submit, proposals for grants under this section, including by conducting outreach activities for—

(A) * * *

* * * * *

(g) REPORT ON RECRUITING AND RETAINING EARLY CAREER SCIENCE AND ENGINEERING RESEARCHERS AT NATIONAL LABORATORIES.—

(1) IN GENERAL.—Not later than 90 days after the date of enactment of this Act, the [Director] Secretary shall submit to the Committee on Science and Technology of the House of Representatives and the Committee on Energy and Natural Resources of the Senate a report describing efforts of the [Director] Secretary to recruit and retain young scientists and engineers at early career stages at the National Laboratories.

* * * * *

(h) AUTHORIZATION OF APPROPRIATIONS.—There is authorized to be appropriated to the Secretary[, acting through the Director,] to carry out this section [\$25,000,000 for each of fiscal years 2008 through 2010] *such sums as are necessary*.

* * * * *

SEC. 5009. PROTECTING AMERICA'S COMPETITIVE EDGE (PACE) GRADUATE FELLOWSHIP PROGRAM.

(a) * * *

* * * * *

(c) SELECTION.—

(1) IN GENERAL.—The Secretary shall award fellowships to eligible students under this section through a competitive merit review process, [involving written and oral interviews,

that will result in a wide distribution of awards throughout the United States,] as determined by the Secretary.

(2) CRITERIA.—The Secretary shall establish selection criteria for awarding fellowships under this section that require an eligible student—

(A) * * *

(B) to demonstrate to the Secretary—

(i) * * *

* * * * *

(iv) excellent [verbal and] communication skills to explain, defend, and demonstrate an understanding of technical subjects relating to the fellowship; and

* * * * *

(d) AWARDS.—

(1) AMOUNT.—A fellowship awarded under this section shall—

(A) * * *

(B) cover—

(i) *partial or full* graduate tuition at an institution of higher education described in subsection (a); and

* * * * *

[(f) AUTHORIZATION OF APPROPRIATIONS.—There are authorized to be appropriated to carry out this section—

[(1) \$7,500,000 for fiscal year 2008;

[(2) \$12,000,000 for fiscal year 2009, including nonexpiring fellowships for the preceding fiscal year; and

[(3) \$20,000,000 for fiscal year 2010, including nonexpiring fellowships for preceding fiscal years.]

* * * * *

SEC. 5012. ADVANCED RESEARCH PROJECTS AGENCY—ENERGY.

(a) * * *

* * * * *

(c) GOALS.—

(1) * * *

(2) MEANS.—ARPA-E shall achieve the goals established under paragraph (1) through energy technology projects by—

(A) identifying and promoting revolutionary advances in fundamental *and applied* sciences;

(B) translating scientific discoveries and cutting-edge inventions into technological innovations; [and]

(C) accelerating transformational technological advances in areas that industry by itself is not likely to undertake because of technical and financial uncertainty[.]; and

(D) *promoting the commercial application of advanced energy technologies.*

* * * * *

(e) RESPONSIBILITIES.—The responsibilities of the Director shall include—

(1) * * *

* * * * *

(3) administering the Fund through awards to institutions of higher education, companies, research foundations, trade and industry research collaborations, or consortia of such entities, which may include federally-funded research and development centers, to achieve the goals described in subsection (c) through targeted acceleration of—

(A) * * *

* * * * *

[(C) research and development of manufacturing processes for novel energy technologies; and]

(C) *research and development of advanced manufacturing process and technologies for the domestic manufacturing of novel energy technologies; and*

(D) coordination with nongovernmental entities for demonstration of technologies and research applications to facilitate technology transfer; [and]

(4) terminating programs carried out under this section that are not achieving the goals of the programs[.]; and

(5) pursuant to subsection (c)(2)(C)—

(A) *ensuring that applications for funding disclose the extent of current and prior efforts, including monetary investments as appropriate, in pursuit of the technology area for which funding is being requested;*

(B) *adopting measures to ensure that, in making awards, program managers adhere to the objectives in subsection (c)(2)(C); and*

(C) *providing as part of the annual report required by subsection (h)(1) a summary of the instances of and reasons for ARPA-E funding projects in technology areas already being undertaken by industry.*

(f) AWARDS.—*In carrying out this section, the Director shall initiate and execute awards in the form of grants, contracts, cooperative agreements, cash prizes, and other transactions.*

[(f)] (g) PERSONNEL.—

(1) IN GENERAL.—*The Director shall establish and maintain within ARPA-E a staff with sufficient qualifications and expertise to enable ARPA-E to carry out its responsibilities under this section in conjunction with the operations of the rest of the Department.*

[(1)] (2) [PROGRAM MANAGERS] PROGRAM DIRECTORS.—

(A) IN GENERAL.—The Director shall designate employees to serve as [program managers] *program directors* for [each of] the programs established pursuant to the responsibilities established for ARPA-E under subsection (e).

(B) RESPONSIBILITIES.—A [program manager] *program director* of a program shall be responsible for—

(i) * * *

* * * * *

(iv) selecting on the basis of merit[, with advice under subsection (j) as appropriate,] each of the projects to be supported under the program after considering—

(I) * * *

* * * * *

(v) identifying innovative cost-sharing arrangements for ARPA-E projects, including through use of the authority under section 988(b)(3) of the Energy Policy Act of 2005 (42 U.S.C. 16352(b)(3)); identifying innovative cost-sharing arrangements for ARPA-E projects, including through use of the authority under section 988(b)(3) of the Energy Policy Act of 2005 (42 U.S.C. 16352(b)(3));

[(v)] (vi) monitoring the progress of projects supported under the program; [and]

(vii) identifying mechanisms for commercial application of successful energy technology development projects, including through establishment of partnerships between awardees and commercial entities; and

[(vi)] (viii) recommending program restructure or termination of research partnerships or whole projects.

(C) TERM.—The term of a program manager shall be up to 3 years and may be renewed.

[(2)] (3) HIRING AND MANAGEMENT.—

(A) IN GENERAL.—The Director shall have the authority to—

(i) * * *

* * * * *

[(B) NUMBER.—The Director shall appoint not less than 70, and not more than 120, personnel under this section.]

[(C)] (B) PRIVATE RECRUITING FIRMS.—The Secretary, or the Director serving as an agent of the Secretary, may contract with private recruiting firms for the hiring of qualified technical staff to carry out this section.

[(D)] (C) ADDITIONAL STAFF.—The Director may use all authorities in existence on the date of enactment of this Act that are provided to the Secretary to hire administrative, financial, and clerical staff as necessary to carry out this section.

(4) FELLOWSHIPS.—The Director is authorized to select exceptional early-career and senior scientific, legal, business, and technical personnel to serve as fellows to work at ARPA-E for terms not to exceed two years. Responsibilities of fellows may include—

(A) supporting program managers in program creation, design, implementation, and management;

(B) exploring technical fields for future ARPA-E program areas;

(C) assisting the Director in the creation of the strategic vision for ARPA-E referred to in subsection (h)(2);

(D) preparing energy technology and economic analyses; and

(E) any other appropriate responsibilities identified by the Director.

[(g)] (h) REPORTS AND ROADMAPS.—

(1) * * *

(2) STRATEGIC VISION ROADMAP.—Not later than October 1, [2008] 2010, and October 1, [2011] 2013, the Director shall provide to the relevant authorizing and appropriations committees of Congress a roadmap describing the strategic vision that ARPA-E will use to guide the choices of ARPA-E for future technology investments over the following 3 fiscal years.

[(h)] (i) COORDINATION AND NONDUPLICATION.—

(1) * * *

* * * * *

[(i)] FEDERAL DEMONSTRATION OF TECHNOLOGIES.—The Secretary shall make information available to purchasing and procurement programs of Federal agencies regarding the potential to demonstrate technologies resulting from activities funded through ARPA-E.]

(j) FEDERAL DEMONSTRATION OF TECHNOLOGIES.—The Director shall seek opportunities to partner with purchasing and procurement programs of Federal agencies to demonstrate energy technologies resulting from activities funded through ARPA-E.

(k) EVENTS.—

(1) The Director is authorized to convene, organize, and sponsor events that further the objectives of ARPA-E, including events that assemble awardees, the most promising applicants for ARPA-E funding, and a broad range of ARPA-E stakeholders (which may include members of relevant scientific research and academic communities, government officials, financial institutions, private investors, entrepreneurs, and other private entities), for the purposes of—

(A) demonstrating projects of ARPA-E awardees;

(B) demonstrating projects of finalists for ARPA-E awards and other energy technology projects;

(C) facilitating discussion of the commercial application of energy technologies developed under ARPA-E and other government-sponsored research and development programs;

or

(D) such other purposes as the Director considers appropriate.

(2) Funding for activities described in paragraph (1) shall be provided as part of the technology transfer and outreach activities authorized under subsection (o)(4)(B).

[(j)] (l) ADVICE.—

(1) * * *

* * * * *

[(k)] (m) ARPA-E EVALUATION.—

(1) IN GENERAL.—After ARPA-E has been in operation for [4 years] 6 years, the Secretary shall offer to enter into a contract with the National Academy of Sciences under which the National Academy shall conduct an evaluation of how well ARPA-E is achieving the goals and mission of ARPA-E.

(2) INCLUSIONS.—The evaluation shall include—

(A) * * *

(B) a description of lessons learned from operation of ARPA-E, and how those lessons may apply to the operation of other programs within the Department of Energy.

* * * * *

[(1)] (n) EXISTING AUTHORITIES.—The authorities granted by this section are—

(1) * * *

* * * * *

[(m)] (o) FUNDING.—

(1) * * *

[(2) AUTHORIZATION OF APPROPRIATIONS.—Subject to paragraphs (4) and (5), there are authorized to be appropriated to the Director for deposit in the Fund, without fiscal year limitation—

[(A) \$300,000,000 for fiscal year 2008; and

[(B) such sums as are necessary for each of fiscal years 2009 and 2010.]

(2) AUTHORIZATION OF APPROPRIATIONS.—Subject to paragraph (4), there are authorized to be appropriated to the Director for deposit in the Fund, without fiscal year limitation—

(A) \$300,000,000 for fiscal year 2011;

(B) \$450,000,000 for fiscal year 2012;

(C) \$600,000,000 for fiscal year 2013;

(D) \$800,000,000 for fiscal year 2014; and

(E) \$1,000,000,000 for fiscal year 2015.

* * * * *

[(4) LIMITATION.—No amounts may be appropriated for ARPA-E for fiscal year 2008 unless the amount appropriated for the activities of the Office of Science of the Department for fiscal year 2008 exceeds the amount appropriated for the Office for fiscal year 2007, as adjusted for inflation in accordance with the Consumer Price Index published by the Bureau of Labor Statistics of the Department of Labor.]

[(5)] (4) ALLOCATION.—Of the amounts appropriated for a fiscal year under paragraph (2)—

(A) not more than 50 percent of the amount shall be used to carry out subsection (e)(3)(D);

(B) at least [2.5 percent] 5 percent of the amount shall be used for technology transfer and outreach activities, consistent with the goal described in subsection (c)(2)(D) and within the responsibilities of program directors as specified in subsection (g)(2)(B)(vii); and

* * * * *

TITLE VII—NATIONAL SCIENCE FOUNDATION

* * * * *

SEC. 7026. LABORATORY SCIENCE PILOT PROGRAM.

(a) * * *

* * * * *

[(d) SUNSET.—The provisions of this section shall cease to have force or effect on the last day of fiscal year 2010.]

[(e) AUTHORIZATION OF APPROPRIATIONS.—From the amounts authorized under subsections (a)(2)(B), (b)(2)(B), and (c)(2)(B) of section 7002, there are authorized to be appropriated to carry out this section and the amendments made by this section \$5,000,000 for fiscal year 2008, and such sums as may be necessary for each of the 2 succeeding fiscal years.]]

* * * * *

[SEC. 7034. PROFESSIONAL SCIENCE MASTER'S DEGREE PROGRAMS.]

[(a) CLEARINGHOUSE.—

[(1) DEVELOPMENT.—The Director shall establish a clearinghouse, in collaboration with 4-year institutions of higher education (including applicable graduate schools and academic departments), and industries and Federal agencies that employ science-trained personnel, to share program elements used in successful professional science master's degree programs and other advanced degree programs related to science, technology, engineering, and mathematics.]

[(2) AVAILABILITY.—The Director shall make the clearinghouse of program elements developed under paragraph (1) available to institutions of higher education that are developing professional science master's degree programs.]

[(b) PROGRAMS.—

[(1) PROGRAMS AUTHORIZED.—The Director shall award grants to 4-year institutions of higher education to facilitate the institutions' creation or improvement of professional science master's degree programs that may include linkages between institutions of higher education and industries that employ science-trained personnel, with an emphasis on practical training and preparation for the workforce in high-need fields.]

[(2) APPLICATION.—A 4-year institution of higher education desiring a grant under this section shall submit an application to the Director at such time, in such manner, and accompanied by such information as the Director may require. The application shall include—

[(A) a description of the professional science master's degree program that the institution of higher education will implement;

[(B) a description of how the professional science master's degree program at the institution of higher education will produce individuals for the workforce in high-need fields;

[(C) the amount of funding from non-Federal sources, including from private industries, that the institution of higher education shall use to support the professional science master's degree program; and

[(D) an assurance that the institution of higher education shall encourage students in the professional science master's degree program to apply for all forms of Federal assistance available to such students, including applicable graduate fellowships and student financial assistance]

under titles IV and VII of the Higher Education Act of 1965 (20 U.S.C. 1070 et seq., 1133 et seq.).

[(3) PREFERENCES.—The Director shall give preference in making awards to 4-year institutions of higher education seeking Federal funding to create or improve professional science master’s degree programs, to those applicants—

[(A) located in States with low percentages of citizens with graduate or professional degrees, as determined by the Bureau of the Census, that demonstrate success in meeting the unique needs of the corporate, non-profit, and government communities in the State, as evidenced by providing internships for professional science master’s degree students or similar partnership arrangements; or

[(B) that secure more than two-thirds of the funding for such professional science master’s degree programs from sources other than the Federal Government.

[(4) NUMBER OF GRANTS; TIME PERIOD OF GRANTS.—

[(A) NUMBER OF GRANTS.—Subject to the availability of appropriated funds, the Director shall award grants under paragraph (1) to a maximum of 200 4-year institutions of higher education.

[(B) TIME PERIOD OF GRANTS.—Grants awarded under this section shall be for one 3-year term. Grants may be renewed only once for a maximum of 2 additional years.

[(5) EVALUATION AND REPORTS.—

[(A) DEVELOPMENT OF PERFORMANCE BENCHMARKS.—Prior to the start of the grant program, the Director, in collaboration with 4-year institutions of higher education (including applicable graduate schools and academic departments), and industries and Federal agencies that employ science-trained personnel, shall develop performance benchmarks to evaluate the pilot programs assisted by grants under this section.

[(B) EVALUATION.—For each year of the grant period, the Director, in consultation with 4-year institutions of higher education (including applicable graduate schools and academic departments), and industries and Federal agencies that employ science-trained personnel, shall complete an evaluation of each program assisted by grants under this section. Any program that fails to satisfy the performance benchmarks developed under subparagraph (A) shall not be eligible for further funding.

[(C) REPORT.—Not later than 180 days after the completion of an evaluation described in subparagraph (B), the Director shall submit a report to Congress that includes—

[(i) the results of the evaluation; and

[(ii) recommendations for administrative and legislative action that could optimize the effectiveness of the pilot programs, as the Director determines to be appropriate.]

* * * * *

**DEPARTMENT OF ENERGY SCIENCE EDUCATION
ENHANCEMENT ACT**

**DIVISION C—OTHER NATIONAL
DEFENSE AUTHORIZATIONS**

* * * * *

**TITLE XXXI—DEPARTMENT OF ENERGY NATIONAL
SECURITY PROGRAMS**

* * * * *

PART E—DEPARTMENT OF ENERGY SCIENCE EDUCATION PROGRAMS

* * * * *

Subpart A—Science Education Enhancement

* * * * *

[SEC. 3164. SCIENCE EDUCATION PROGRAMS.

[(a) PROGRAMS.—The Secretary is authorized to establish programs to enhance the quality of mathematics, science, and engineering education. Any such programs shall be operated at or through the support of Department research and development facilities, shall use the scientific resources of the Department, and shall be consistent with the overall Federal plan for education and human resources in science and technology developed by the Federal Coordinating Council for Science, Engineering, and Technology.

[(b) ORGANIZATION OF SCIENCE, ENGINEERING, AND MATHEMATICS EDUCATION PROGRAMS.—

[(1) DIRECTOR OF SCIENCE, ENGINEERING, AND MATHEMATICS EDUCATION.—Notwithstanding any other provision of law, the Secretary, acting through the Under Secretary for Science (referred to in this subsection as the “Under Secretary”), shall appoint a Director of Science, Engineering, and Mathematics Education (referred to in this subsection as the “Director”) with the principal responsibility for administering science, engineering, and mathematics education programs across all functions of the Department.

[(2) QUALIFICATIONS.—The Director shall be an individual, who by reason of professional background and experience, is specially qualified to advise the Under Secretary on all matters pertaining to science, engineering, and mathematics education at the Department.

[(3) DUTIES.—The Director shall—

[(A) oversee all science, engineering, and mathematics education programs of the Department;

[(B) represent the Department as the principal inter-agency liaison for all science, engineering, and mathematics education programs, unless otherwise represented by the Secretary or the Under Secretary;

[(C) prepare the annual budget and advise the Under Secretary on all budgetary issues for science, engineering, and mathematics education programs of the Department;

[(D) increase, to the maximum extent practicable, the participation and advancement of women and underrepresented minorities at every level of science, technology, engineering, and mathematics education; and

[(E) perform other such matters relating to science, engineering, and mathematics education as are required by the Secretary or the Under Secretary.

[(4) STAFF AND OTHER RESOURCES.—The Secretary shall assign to the Director such personnel and other resources as the Secretary considers necessary to permit the Director to carry out the duties of the Director.

[(5) ASSESSMENT.—

[(A) IN GENERAL.—The Secretary shall offer to enter into a contract with the National Academy of Sciences under which the National Academy, not later than 5 years after, and not later than 10 years after, the date of enactment of this paragraph, shall assess the performance of the science, engineering, and mathematics education programs of the Department.

[(B) CONSIDERATIONS.—An assessment under this paragraph shall be conducted taking into consideration, where applicable, the effect of science, engineering, and mathematics education programs of the Department on student academic achievement in science and mathematics.

[(6) AUTHORIZATION OF APPROPRIATIONS.—There are authorized to be appropriated such sums as are necessary to carry out this subsection.

[(c) RELATIONSHIP TO OTHER DEPARTMENT ACTIVITIES.—The programs described in subsection (a) shall supplement and be coordinated with current activities of the Department, but shall not supplant them.

[(d) SCIENCE, ENGINEERING, AND MATHEMATICS EDUCATION FUND.—The Secretary shall establish a Science, Engineering, and Mathematics Education Fund, using not less than 0.3 percent of the amount made available to the Department for research, development, demonstration, and commercial application for each fiscal year, to carry out sections 3165, 3166, and 3167.

[(e) ANNUAL PLAN FOR ALLOCATION OF EDUCATION FUNDING.—The Secretary shall submit to Congress as part of the annual budget submission for a fiscal year a report describing the manner in which the Department has complied with subsection (d) for the prior fiscal year and the manner in which the Department proposes to comply with subsection (d) during the following fiscal year, including—

[(1) the total amount of funding for research, development, demonstration, and commercial application activities for the corresponding fiscal year;

[(2) the amounts set aside for the Science, Engineering, and Mathematics Education Fund under subsection (d) from funding for research activities, development activities, demonstration activities, and commercial application activities for the corresponding fiscal year; and

[(3) a description of how the funds set aside under subsection (d) were allocated for the prior fiscal year and will be allocated for the following fiscal year.]

[(f) PROGRAMS FOR STUDENTS FROM UNDER-REPRESENTED GROUPS.—In carrying out a program under subsection (a), the Secretary shall give priority to activities that are designed to encourage students from under-represented groups to pursue scientific and technical careers.]]

* * * * *

Subpart B—Science, Engineering, and Mathematics Education Programs

SEC. 3170. DEFINITIONS.

In this subpart:

[(1) DIRECTOR.—The term “Director” means the Director of Science, Engineering, and Mathematics Education.]

(1) *DIRECTOR.*—The term “Director” means the Director of STEM Education appointed or designated under section 3171(c)(1).

(2) *ENERGY SYSTEMS SCIENCE AND ENGINEERING.*—The term “energy systems science and engineering” means—

(A) *nuclear science and engineering, including—*

- (i) *nuclear engineering;*
- (ii) *nuclear chemistry;*
- (iii) *radiochemistry; and*
- (iv) *health physics;*

(B) *hydrocarbon system science and engineering, including—*

- (i) *petroleum or reservoir engineering;*
- (ii) *environmental geoscience;*
- (iii) *petrophysics;*
- (iv) *geophysics;*
- (v) *geochemistry;*
- (vi) *petroleum geology;*
- (vii) *ocean engineering; and*
- (viii) *environmental engineering;*

(C) *energy efficiency and renewable energy technology systems science and engineering, including with respect to—*

- (i) *solar technology systems;*
- (ii) *wind technology systems;*
- (iii) *buildings technology systems;*
- (iv) *transportation technology systems;*
- (v) *hydropower systems; and*
- (vi) *geothermal systems; and*

(D) *energy storage and distribution systems science and engineering, including with respect to—*

- (i) *energy storage; and*
- (ii) *energy delivery.*

[(2)] (3) NATIONAL LABORATORY.—The term “National Laboratory” has the meaning given the term in section 2 of the Energy Policy Act of 2005 (42 U.S.C. 15801).

(4) *STEM*.—The term “*STEM*” means science, technology, engineering, and mathematics.

[CHAPTER 1—PILOT PROGRAM OF GRANTS TO SPECIALTY SCHOOLS FOR SCIENCE AND MATHEMATICS

[SEC. 3171. PILOT PROGRAM OF GRANTS TO SPECIALTY SCHOOLS FOR SCIENCE AND MATHEMATICS.

[(a) **PURPOSE.**—The purpose of this section is to establish a pilot program of grants to States to help establish or expand public, statewide specialty secondary schools that provide comprehensive science and mathematics (including technology and engineering) education to improve the academic achievement of students in science and mathematics.

[(b) **DEFINITION OF SPECIALTY SCHOOL FOR SCIENCE AND MATHEMATICS.**—In this chapter, the term “specialty school for science and mathematics” means a public secondary school (including a school that provides residential services to students) that—

[(1) serves students residing in the State in which the school is located; and

[(2) offers to those students a high-quality, comprehensive science and mathematics (including technology and engineering) curriculum designed to improve the academic achievement of students in science and mathematics.

[(c) **PILOT PROGRAM AUTHORIZED.**—

[(1) **IN GENERAL.**—From the amounts authorized under subsection (i), the Secretary, acting through the Director and in consultation with the Director of the National Science Foundation, shall award grants, on a competitive basis, to States in order to provide assistance to the States for the costs of establishing or expanding public, statewide specialty schools for science and mathematics.

[(2) **RESOURCES.**—The Director shall ensure that appropriate resources of the Department, including the National Laboratories, are available to schools funded under this section in order to—

[(A) increase experiential, hands-on learning opportunities in science, technology, engineering, and mathematics for students attending such schools; and

[(B) provide ongoing professional development opportunities for teachers employed at such schools.

[(3) **ASSISTANCE.**—Consistent with sections 3165 and 3166, the Director shall make available from funds authorized in this section to carry out a program using scientific and engineering staff of the National Laboratories, during which the staff—

[(A) assists teachers in teaching courses at the schools funded under this section;

[(B) uses National Laboratory scientific equipment in teaching the courses; and

[(C) uses distance education and other technologies to provide assistance described in subparagraphs (A) and (B) to schools funded under this section that are not located near the National Laboratories.

[(4) **RESTRICTIONS.**—

[(A) **MAXIMUM NUMBER OF FUNDED SPECIALTY SCHOOLS PER STATE.**—No State shall receive funding for more than

1 specialty school for science and mathematics for a fiscal year.

[(B) MAXIMUM AMOUNT AND DURATION OF GRANTS.—A grant awarded to a State for a specialty school for science and mathematics under this section—

[(i) shall not exceed \$2,000,000 for a fiscal year; and

[(ii) shall not be provided for more than 3 fiscal years.

[(d) FEDERAL AND NON-FEDERAL SHARES.—

[(1) FEDERAL SHARE.—The Federal share of the costs described in subsection (c)(1) shall not exceed 33 percent.

[(2) NON-FEDERAL SHARE.—The non-Federal share of the costs described in subsection (c)(1) shall be—

[(A) not less than 67 percent; and

[(B) provided from non-Federal sources, in cash or in kind, fairly evaluated, including services.

[(e) APPLICATION.—To be eligible to receive a grant under this section, a State shall submit to the Director an application at such time, in such manner, and containing such information as the Director may require that describes—

[(1) the process by which and selection criteria with which the State will select and designate a school as a specialty school for science and mathematics in accordance with this section;

[(2) how the State will ensure that funds made available under this section are used to establish or expand a specialty school for science and mathematics—

[(A) in accordance with the activities described in subsection (g); and

[(B) that has the capacity to improve the academic achievement of all students in all core academic subjects, and particularly in science and mathematics;

[(3) how the State will measure the extent to which the school increases student academic achievement on State academic achievement standards in science, mathematics, and, to the maximum extent applicable, technology and engineering;

[(4) the curricula and materials to be used in the school;

[(5) the availability of funds from non-Federal sources for the costs of the activities authorized under this section; and

[(6) how the State will use technical assistance and support from the Department, including the National Laboratories, and other entities with experience and expertise in science, technology, engineering, and mathematics education, including institutions of higher education.

[(f) DISTRIBUTION.—In awarding grants under this section, the Director shall—

[(1) ensure a wide, equitable distribution among States that propose to serve students from urban and rural areas; and

[(2) provide equal consideration to States without National Laboratories.

[(g) USES OF FUNDS.—

[(1) REQUIREMENT.—A State that receives a grant under this section shall use the funds made available through the grant to—

[(A) employ proven strategies and methods for improving student learning and teaching in science, technology, engineering, and mathematics;

[(B) integrate into the curriculum of the school comprehensive science and mathematics education, including instruction and assessments in science, mathematics, and to the extent applicable, technology and engineering that are aligned with the academic content and student academic achievement standards of the State, within the meaning of section 1111 of the Elementary and Secondary Education Act of 1965 (20 U.S.C. 6311);

[(C) create opportunities for enhanced and ongoing professional development for teachers that improves the science, technology, engineering, and mathematics content knowledge of the teachers; and

[(D) design and implement hands-on laboratory experiences to help prepare students to pursue postsecondary studies in science, technology, engineering, and mathematics fields.

[(2) SPECIAL RULE.—Grant funds under this section may be used for activities described in paragraph (1) only if the activities are directly relating to improving student academic achievement in science, mathematics, and to the extent applicable, technology and engineering.

[(h) EVALUATION AND REPORT.—

[(1) STATE EVALUATION AND REPORT.—

[(A) EVALUATION.—Each State that receives a grant under this section shall develop and carry out an evaluation and accountability plan for the activities funded through the grant that measures the impact of the activities, including measurable objectives for improved student academic achievement on State science, mathematics, and, to the maximum extent applicable, technology and engineering assessments.

[(B) REPORT.—The State shall submit to the Director a report containing the results of the evaluation and accountability plan.

[(2) REPORT TO CONGRESS.—Not later than 2 years after the date of enactment of the PACE–Energy Act, the Director shall submit a report detailing the impact of the activities assisted with funds made available under this section to—

[(A) the Committee on Science and Technology of the House of Representatives;

[(B) the Committee on Energy and Natural Resources of the Senate; and

[(C) the Committee on Health, Education, Labor, and Pensions of the Senate.

[(i) AUTHORIZATION OF APPROPRIATIONS.—There are authorized to be appropriated to carry out this section—

[(1) \$14,000,000 for fiscal year 2008;

[(2) \$22,500,000 for fiscal year 2009; and

[(3) \$30,000,000 for fiscal year 2010.

[CHAPTER 2—EXPERIENTIAL-BASED LEARNING OPPORTUNITIES

[SEC. 3175. EXPERIENTIAL-BASED LEARNING OPPORTUNITIES.

[(a) INTERNSHIPS AUTHORIZED.—

[(1) IN GENERAL.—From the amounts authorized under subsection (f), the Secretary, acting through the Director, shall establish a summer internship program for middle school and secondary school students that shall—

[(A) provide the students with internships at the National Laboratories;

[(B) promote experiential, hands-on learning in science, technology, engineering, or mathematics; and

[(C) be of at least 2 weeks in duration.

[(2) RESIDENTIAL SERVICES.—The Director may provide residential services to students participating in the internship program authorized under paragraph (1).

[(b) SELECTION CRITERIA.—

[(1) IN GENERAL.—The Director shall establish criteria to determine the sufficient level of academic preparedness necessary for a student to be eligible for an internship under this section.

[(2) PARTICIPATION.—The Director shall ensure the participation of students from a wide distribution of States, including States without National Laboratories.

[(3) STUDENT ACHIEVEMENT.—The Director may consider the academic achievement of middle and secondary school students in determining eligibility under this section, in accordance with paragraphs (1) and (2).

[(c) PRIORITY.—

[(1) IN GENERAL.—The Director shall give priority for an internship under this section to a student who meets the eligibility criteria described in subsection (b) and who attends a school—

[(A)(i) in which not less than 30 percent of the children enrolled in the school are from low-income families; or

[(ii) that is designated with a school locale code of 41, 42, or 43, as determined by the Secretary of Education; and

[(B) for which there is—

[(i) a high percentage of teachers who are not teaching in the academic subject areas or grade levels in which the teachers were trained to teach;

[(ii) a high teacher turnover rate; or

[(iii) a high percentage of teachers with emergency, provisional, or temporary certification or licenses.

[(2) COORDINATION.—The Director shall consult with the Secretary of Education in order to determine whether a student meets the priority requirements of this subsection.

[(d) OUTREACH AND EXPERIENTIAL-BASED PROGRAMS FOR MINORITY STUDENTS.—

[(1) IN GENERAL.—The Secretary, acting through the Director, in cooperation with Hispanic-serving institutions, historically Black colleges and universities, tribally controlled colleges and universities, Alaska Native- and Native Hawaiian-serving institutions, and other minority-serving institutions and non-

profit entities with substantial experience relating to outreach and experiential-based learning projects, shall establish outreach and experiential-based learning programs that will encourage underrepresented minority students in kindergarten through grade 12 to pursue careers in science, engineering, and mathematics.

[(2) COMMUNITY INVOLVEMENT.—The Secretary shall ensure that the programs established under paragraph (1) involve, to the maximum extent practicable—

[(A) participation by parents and educators; and

[(B) the establishment of partnerships with business organizations and appropriate Federal, State, and local agencies.

[(3) DISTRIBUTION.—The Secretary shall ensure that the programs established under paragraph (1) are located in diverse geographic regions of the United States, to the maximum extent practicable.

[(e) EVALUATION AND ACCOUNTABILITY PLAN.—The Director shall develop an evaluation and accountability plan for the activities funded under this chapter that objectively measures the impact of the activities.

[(f) AUTHORIZATION OF APPROPRIATIONS.—There is authorized to be appropriated to carry out this section \$7,500,000 for each of fiscal years 2008 through 2010.

[CHAPTER 3—NATIONAL LABORATORIES CENTERS OF EXCELLENCE IN SCIENCE, TECHNOLOGY, ENGINEERING, AND MATHEMATICS EDUCATION

[SEC. 3181. NATIONAL LABORATORIES CENTERS OF EXCELLENCE IN SCIENCE, TECHNOLOGY, ENGINEERING, AND MATHEMATICS EDUCATION.

[(a) DEFINITION OF HIGH-NEED PUBLIC SECONDARY SCHOOL.—In this section, the term “high-need public secondary school” means a secondary school—

[(1) with a high concentration of low-income individuals (as defined in section 1707 of the Elementary and Secondary Education Act of 1965 (20 U.S.C. 6537)); or

[(2) designated with a school locale code of 41, 42, or 43, as determined by the Secretary of Education.

[(b) ESTABLISHMENT.—The Secretary shall establish at each of the National Laboratories a program to support a Center of Excellence in Science, Technology, Engineering, and Mathematics (referred to in this section as a “Center of Excellence”) in at least 1 high-need public secondary school located in the region served by the National Laboratory to provide assistance in accordance with subsection (f).

[(c) COLLABORATION.—

[(1) IN GENERAL.—To comply with subsection (g), each high-need public secondary school selected as a Center of Excellence and the National Laboratory shall form a partnership with a school, department, or program of education at an institution of higher education.

[(2) NONPROFIT ENTITIES.—The partnership may include a nonprofit entity with demonstrated experience and effective-

ness in science or mathematics, as agreed to by other members of the partnership.

[(d) SELECTION.—

[(1) IN GENERAL.—The Secretary, acting through the Director, shall establish criteria to guide the National Laboratories in selecting the sites for Centers of Excellence.

[(2) PROCESS.—A National Laboratory shall select a site for a Center of Excellence through an open, widely-publicized, and competitive process.

[(e) GOALS.—The Secretary shall establish goals and performance assessments for each Center of Excellence authorized under subsection (b).

[(f) ASSISTANCE.—Consistent with sections 3165 and 3166, the Director shall make available necessary assistance for a program established under this section through the use of scientific and engineering staff of a National Laboratory, including the use of staff—

[(1) to assist teachers in teaching a course at a Center of Excellence in Science, Technology, Engineering, and Mathematics; and

[(2) to use National Laboratory scientific equipment in the teaching of the course.

[(g) SPECIAL RULES.—A Center of Excellence in a region shall ensure—

[(1) provision of clinical practicum, student teaching, or internship experiences for science, technology, and mathematics teacher candidates as part of the teacher preparation program of the Center of Excellence;

[(2) provision of supervision and mentoring for teacher candidates in the teacher preparation program; and

[(3) to the maximum extent practicable, provision of professional development for veteran teachers in the public secondary schools in the region.

[(h) EVALUATION.—The Secretary shall consider the results of performance assessments required under subsection (e) in determining the contract award fee of a National Laboratory management and operations contractor.

[(i) PLAN.—The Director shall—

[(1) develop an evaluation and accountability plan for the activities funded under this section that objectively measures the impact of the activities; and

[(2) disseminate information obtained from those measurements.

[(j) NO EFFECT ON SIMILAR PROGRAMS.—Nothing in this section displaces or otherwise affects any similar program being carried out as of the date of enactment of this section at any National Laboratory under any other provision of law.

[CHAPTER 4—SUMMER INSTITUTES

[SEC. 3185. SUMMER INSTITUTES.

[(a) DEFINITIONS.—In this section:

[(1) ELIGIBLE PARTNER.—The term “eligible partner” means—

[(A) the science, engineering, or mathematics department at an institution of higher education, acting in co-

ordination with a school, department, or program of education at an institution of higher education that provides training for teachers and principals; or

[(B) a nonprofit entity with expertise in providing professional development for science, technology, engineering, or mathematics teachers.

[(2) SUMMER INSTITUTE.—The term “summer institute” means an institute, operated during the summer, that—

[(A) is hosted by a National Laboratory or an eligible partner;

[(B) is operated for a period of not less than 2 weeks;

[(C) includes, as a component, a program that provides direct interaction between students and faculty, including personnel of 1 or more National Laboratories who have scientific expertise;

[(D) provides for follow-up training, during the academic year, that is conducted in the classroom; and

[(E) provides hands-on science, technology, engineering, or mathematics laboratory experience for not less than 2 days.

[(b) SUMMER INSTITUTE PROGRAMS AUTHORIZED.—

[(1) PROGRAMS AT THE NATIONAL LABORATORIES.—The Secretary, acting through the Director, shall establish or expand programs of summer institutes at each of the National Laboratories to provide additional training to strengthen the science, technology, engineering, and mathematics teaching skills of teachers employed at public schools for kindergarten through grade 12, in accordance with the activities authorized under paragraphs (3) and (4).

[(2) PROGRAMS WITH ELIGIBLE PARTNERS.—

[(A) IN GENERAL.—The Secretary, acting through the Director, shall identify and provide assistance as described in subparagraph (C) to eligible partners to establish or expand programs of summer institutes that provide additional training to strengthen the science, technology, engineering, and mathematics teaching skills of teachers employed at public schools for kindergarten through grade 12, in accordance with paragraphs (3) and (4).

[(B) SELECTION CRITERIA.—In identifying eligible partners under subparagraph (A), the Secretary shall require that partner institutions describe—

[(i) how the partner institution has the capability to administer the program in accordance with this section, which may include a description of any existing programs at the institution of the applicant that are targeted at education of science and mathematics teachers and the number of teachers graduated annually from the programs; and

[(ii) how the partner institution will assist the National Laboratory in carrying out the activities described in paragraphs (3) and (4).

[(C) ASSISTANCE.—Consistent with sections 3165 and 3166, the Director shall make available funds authorized under this section to carry out a program using scientific

and engineering staff of the National Laboratories, during which the staff—

[(i) assists in providing training to teachers at summer institutes; and

[(ii) uses National Laboratory scientific equipment in the training.

[(3) REQUIRED ACTIVITIES.—Funds authorized under this section shall be used for—

[(A) creating opportunities for enhanced and ongoing professional development for teachers that improves the science, technology, engineering, and mathematics content knowledge of the teachers;

[(B) training to improve the ability of science, technology, engineering, and mathematics teachers to translate content knowledge and recent developments in pedagogy into classroom practice, including training to use curricula that are—

[(i) based on scientific research; and

[(ii) aligned with challenging State academic content standards;

[(C) training on the use and integration of technology in the classrooms; and

[(D) supplemental and follow-up professional development activities as described in subsection (a)(2)(D).

[(4) ADDITIONAL USES OF FUNDS.—Funds authorized under this section may be used for—

[(A) training and classroom materials to assist in carrying out paragraph (3);

[(B) expenses associated with scientific and engineering staff at the National Laboratories assisting in providing training to teachers at summer institutes;

[(C) instruction in the use and integration of data and assessments to inform and instruct classroom practice; and

[(D) stipends and travel expenses for teachers participating in the program.

[(c) PRIORITY.—To the maximum extent practicable, the Director shall ensure that each summer institute program authorized under subsection (b) provides training to—

[(1) teachers from a wide range of school districts;

[(2) teachers from high-need school districts; and

[(3) teachers from groups underrepresented in the fields of science, technology, engineering, and mathematics teaching, including women and members of minority groups.

[(d) COORDINATION AND CONSULTATION.—The Director shall consult and coordinate with the Secretary of Education and the Director of the National Science Foundation regarding the implementation of the programs authorized under subsection (b).

[(e) EVALUATION AND ACCOUNTABILITY PLAN.—

[(1) IN GENERAL.—The Director shall develop an evaluation and accountability plan for the activities funded under this section that measures the impact of the activities.

[(2) CONTENTS.—The evaluation and accountability plan shall include—

[(A) measurable objectives to increase the number of science, technology, and mathematics teachers who participate in the summer institutes involved; and

[(B) measurable objectives for improved student academic achievement on State science, mathematics, and to the maximum extent applicable, technology and engineering assessments.

[(3) REPORT TO CONGRESS.—The Secretary shall submit to Congress with the annual budget submission of the Secretary a report on how the activities assisted under this section improve the science, technology, engineering, and mathematics teaching skills of participating teachers.

[(f) AUTHORIZATION OF APPROPRIATIONS.—There are authorized to be appropriated to carry out this section—

[(1) \$15,000,000 for fiscal year 2008;

[(2) \$20,000,000 for fiscal year 2009; and

[(3) \$25,000,000 for fiscal year 2010.]

CHAPTER 1—STEM EDUCATION

SEC. 3171. STEM EDUCATION.

(a) *IN GENERAL.*—The Secretary of Energy shall develop, conduct, support, promote, and coordinate formal and informal educational activities that leverage the Department's unique content expertise and facilities to contribute to improving STEM education at all levels in the United States, and to enhance awareness and understanding of STEM, including energy sciences, in order to create a diverse skilled scientific and technical workforce essential to meeting the challenges facing the Department and the Nation in the 21st century.

(b) *PROGRAMS.*—The Secretary shall carry out evidence-based programs designed to increase student interest and participation, improve public literacy and support, and improve the teaching and learning of energy systems science and engineering and other STEM disciplines supported by the Department. Programs authorized under this subsection may include—

(1) *informal educational programming designed to excite and inspire students and the general public about energy systems science and engineering and other STEM disciplines supported by the Department, while strengthening their content knowledge in these fields;*

(2) *teacher training and professional development opportunities for pre-service and in-service elementary and secondary teachers designed to increase the content knowledge of teachers in energy systems science and engineering and other STEM disciplines supported by the Department, including through hands-on research experiences;*

(3) *research opportunities for secondary school students, including internships at the National Laboratories, that provide secondary school students with hands-on research experiences as well as exposure to working scientists;*

(4) *research opportunities at the National Laboratories for undergraduate and graduate students pursuing degrees in energy systems science and engineering and other STEM disciplines supported by the Department; and*

(5) *competitive scholarships, fellowships, and traineeships for undergraduate and graduate students in energy systems science and engineering and other STEM disciplines supported by the Department.*

(c) **ORGANIZATION OF STEM EDUCATION PROGRAMS.—**

(1) **DIRECTOR OF STEM EDUCATION.**—*The Secretary shall appoint or designate a Director of STEM Education, who shall have the principal responsibility to oversee and coordinate all programs and activities of the Department in support of STEM education, including energy systems science and engineering education, across all functions of the Department.*

(2) **QUALIFICATIONS.**—*The Director shall be an individual, who by reason of professional background and experience, is specially qualified to advise the Secretary on all matters pertaining to STEM education, including energy systems science and engineering education, at the Department.*

(3) **DUTIES.**—*The Director shall—*

(A) *oversee and coordinate all programs in support of STEM education, including energy systems science and engineering education, across all functions of the Department;*

(B) *represent the Department as the principal interagency liaison for all STEM education programs, unless otherwise represented by the Secretary, the Under Secretary for Science, or the Under Secretary for Energy;*

(C) *prepare the annual budget and advise the Under Secretary for Science and the Under Secretary for Energy on all budgetary issues for STEM education, including energy systems science and engineering education, relative to the programs of the Department;*

(D) *establish, periodically update, and maintain a publicly accessible online inventory of STEM education programs and activities, including energy systems science and engineering education programs and activities;*

(E) *develop, implement, and update the Department of Energy STEM education strategic plan, as required by subsection (d);*

(F) *increase, to the maximum extent practicable, the participation and advancement of women and underrepresented minorities at every level of STEM education, including energy systems science and engineering education; and*

(G) *perform such other matters relating to STEM education as are required by the Secretary, the Under Secretary for Science, or the Under Secretary for Energy.*

(d) **DEPARTMENT OF ENERGY STEM EDUCATION STRATEGIC PLAN.**—*The Director of STEM education appointed or designated under subsection (c)(1) shall develop, implement, and update once every 3 years a 3-year STEM education strategic plan for the Department, which shall—*

(1) *identify and prioritize annual and long-term STEM education goals and objectives for the Department that are aligned with the overall goals of the National Science and Technology Council Committee on STEM Education Strategic plan required under section 301(d)(2) of the STEM Education Coordination Act of 2010;*

(2) describe the role of each program or activity of the Department in contributing to the goals and objectives identified under paragraph (1);

(3) specify the metrics that will be used to assess progress toward achieving those goals and objectives; and

(4) describe the approaches that will be taken to assess the effectiveness of each STEM education program and activity supported by the Department.

(e) *OUTREACH TO STUDENTS FROM UNDERREPRESENTED GROUPS.*—In carrying out a program authorized under this section, the Secretary shall give consideration to the goal of promoting the participation of individuals identified in section 33 or 34 of the Science and Engineering Equal Opportunities Act (42 U.S.C. 1885a or 1885b).

(f) *CONSULTATION AND PARTNERSHIP WITH OTHER AGENCIES.*—In carrying out the programs and activities authorized under this section, the Secretary shall—

(1) consult with the Secretary of Education and the Director of the National Science Foundation regarding activities designed to improve elementary and secondary STEM education; and

(2) consult and partner with the Director of the National Science Foundation in carrying out programs under this section designed to build capacity in STEM education at the undergraduate and graduate level, including by supporting excellent proposals in energy systems science and engineering that are submitted for funding to the Foundation’s Advanced Technological Education Program.

CHAPTER 5—NATIONAL ENERGY EDUCATION DEVELOPMENT

SEC. 3191. NATIONAL ENERGY EDUCATION DEVELOPMENT.

(a) *IN GENERAL.*—The Secretary, acting through the Director and in consultation with the Director of the National Science Foundation, shall establish a program to coordinate and make available to teachers and students **[web-based]**, *through a publicly available website*, kindergarten through high school science, technology, engineering, and mathematics education resources relating to the science and energy mission of the Department, including existing instruction materials and protocols for classroom laboratory experiments *and project-based learning opportunities*.

(b) *ENERGY EDUCATION.*—The materials and other resources required under subsection (a) shall include instruction relating to—

(1) the science of energy, *including energy systems science and engineering*;

* * * * *

[(d) AUTHORIZATION OF APPROPRIATIONS.—There are authorized to be appropriated to carry out this section—

[(1) \$500,000 for fiscal year 2008; and

[(2) such sums as necessary for each fiscal year thereafter.]

[CHAPTER 6—ADMINISTRATION

[SEC. 3195. MENTORING PROGRAM.

[(a) IN GENERAL.—As part of the programs established under chapters 1, 3, and 4, the Director shall establish a program to recruit and provide mentors for women and underrepresented minorities who are interested in careers in science, engineering, and mathematics.

[(b) PAIRING.—The program shall pair mentors with women and minorities who are in programs of study at specialty schools for science and mathematics, Centers of Excellence, and summer institutes established under chapters 1, 3, and 4, respectively.

[(c) PROGRAM EVALUATION.—The Secretary shall annually—

[(1) use metrics to evaluate the success of the programs established under subsection (a); and

[(2) submit to Congress a report that describes the results of each evaluation.]

NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY ACT

* * * * *

ESTABLISHMENT, FUNCTIONS, AND ACTIVITIES

SEC. 2. (a) * * *

(b) The Secretary of Commerce (hereafter in this Act referred to as the “Secretary”) acting through the Director of the Institute (hereafter in this Act referred to as the “Director”) is authorized to take all actions necessary and appropriate to accomplish the purposes of this Act, including the following functions of the Institute—

(1) * * *

* * * * *

(12) to invent, develop, and (when appropriate) promote transfer to the private sector of measurement devices to serve special national needs; **[and]**

(13) to coordinate Federal, State, and local technical standards activities and conformity assessment activities, with private sector technical standards activities and conformity assessment activities, with the goal of eliminating unnecessary duplication and complexity in the development and promulgation of conformity assessment requirements and measures**【.】**;

(14) to *promote collaboration among Federal departments and agencies and private sector stakeholders in the development and implementation of standards and conformity assessment frameworks to address specific Federal Government policy goals; and*

(15) to *convene Federal departments and agencies, as appropriate, to—*

(A) coordinate and determine Federal Government positions on specific policy issues related to the development of international technical standards and conformity assessment-related activities; and

(B) coordinate Federal department and agency engagement in the development of international technical standards and conformity assessment-related activities.

* * * * *

[SEC. 4.]

SEC. 4. UNDER SECRETARY OF COMMERCE FOR STANDARDS AND TECHNOLOGY.

(a) ESTABLISHMENT.—There shall be in the Department of Commerce an Under Secretary of Commerce for Standards and Technology (in this section referred to as the “Under Secretary”).

(b) APPOINTMENT.—The Under Secretary shall be appointed by the President by and with the advice and consent of the Senate.

(c) COMPENSATION.—The Under Secretary shall be compensated at the rate in effect for level III of the Executive Schedule under section 5314 of title 5, United States Code.

(d) DUTIES.—The Under Secretary shall serve as the Director of the Institute and shall perform such duties as required of the Director by the Secretary under this Act or by law.

(e) APPLICABILITY.—The individual serving as the Director of the Institute on the date of enactment of the National Institute of Standards and Technology Authorization Act of 2010 shall also serve as the Under Secretary until such time as a successor is appointed under subsection (b).

SEC. 5. [The Director shall be appointed by the President, by and with the advice and consent of the Senate.] The Director shall report directly to the Secretary and shall have the general supervision of the Institute, its equipment, and the exercise of its functions. The Director shall make an annual report to the Secretary of Commerce. The Director may issue, when necessary, bulletins for public distribution, containing such information as may be of value to the public or facilitate the exercise of the functions of the Institute. **[The Director shall be compensated at the rate in effect for level IV of the Executive Schedule under section 5315 of title 5, United States Code. Until such time as the Director assumes office under this section, the most recent Director of the National Bureau of Standards shall serve as Director.]**

* * * * *

VISITING COMMITTEE ON ADVANCED TECHNOLOGY

SEC. 10. (a) There is established within the Institute a Visiting Committee on Advanced Technology (hereafter in this Act referred to as the “Committee”). The Committee shall consist of **[15 members]** *at least 15, but not more than 20, members* appointed by the Director, **[at least 10]** *at least 13* of whom shall be from United States industry. The Director shall appoint as original members of the Committee any final members of the National Bureau of Standards Visiting Committee who wish to serve in such capacity. In addition to any powers and functions otherwise granted to it by this Act, the Committee shall review and make recommendations regarding general policy for the Institute, its organization, its budget, and its programs within the framework of applicable national policies as set forth by the President and the Congress.

* * * * *

(h)(1) The Committee shall render an annual report to the Secretary for submission to the Congress not later than 30 days after the submittal to Congress of the President's annual budget request in each year. Such report shall deal essentially, though not necessarily exclusively, with policy issues or matters which affect the Institute, including the [Program established under section 28] programs established under sections 28 and 34, or with which the Committee in its official role as the private sector policy advisor of the Institute is concerned. Each such report shall identify areas of research and research techniques of the Institute of potential importance to the long-term competitiveness of United States industry, in which the Institute possesses special competence, which could be used to assist United States enterprises and United States industrial joint research and development ventures. Such report also shall comment on the programmatic planning document and updates thereto submitted to Congress by the Director under subsections (c) and (d) of section 23.

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SEC. 18. (a) * * *

* * * * *

(c) *UNDERREPRESENTED MINORITIES.*—*In evaluating applications for fellowships under this section, the Director shall give consideration to the goal of promoting the participation of underrepresented minorities in research areas supported by the Institute.*

SEC. 19. The Institute in conjunction with the National Academy of Sciences, shall establish and conduct a post-doctoral fellowship program, subject to the availability of appropriations, which shall be organized and carried out in substantially the same manner as the National Academy of Sciences/National Research Council Post-Doctoral Research Associate Program that was in effect prior to 1986, and which shall include not less than twenty nor more than 120 new fellows per fiscal year. *In evaluating applications for fellowships under this section, the Director shall give consideration to the goal of promoting the participation of underrepresented minorities in research areas supported by the Institute.*

SEC. 19A. (a) * * *

* * * * *

(c) The Director shall develop and issue procedures and selection criteria for participants in the program. *The Director shall give special consideration to an application from a teacher from a high-need school, as defined in section 200 of the Higher Education Act of 1965 (20 U.S.C. 1021).*

* * * * *

REGIONAL CENTERS FOR THE TRANSFER OF MANUFACTURING
TECHNOLOGY

SEC. 25. (a) The Secretary, through the Director and, if appropriate, through other officials, shall provide assistance for the creation and support of Regional Centers for the Transfer of Manufacturing Technology (hereafter in this Act referred to as the "Centers"). Such centers shall be affiliated with any United States-based nonprofit institution or organization, or group thereof, that applies for and is awarded financial assistance under this section

in accordance with the description published by the Secretary in the Federal Register under subsection (c)(2). Individual awards shall be decided on the basis of merit review. The objective of the Centers is to enhance productivity and technological performance in United States manufacturing through—

(1) * * *

* * * * *

(4) the active dissemination of scientific, engineering, technical, and management information about manufacturing to industrial firms, including small- and medium-sized manufacturing companies; **[and]**

(5) the utilization, when appropriate, of the expertise and capability that exists in Federal laboratories other than the Institute~~...~~; **and**

(6) *providing to community colleges information about the job skills needed in small- and medium-sized manufacturing businesses in the regions they serve.*

* * * * *

(c)(1) * * *

* * * * *

(7) *Notwithstanding paragraphs (1), (3), and (5), for fiscal year 2011 through fiscal year 2015, the Secretary may not provide to a Center more than 50 percent of the costs incurred by such Center and may not require that a Center's cost share exceed 50 percent.*

(8) *Not later than 4 years after the date of enactment of the National Institute of Standards and Technology Authorization Act of 2010, the Secretary shall submit to Congress a report on the cost share requirements under the program. The report shall—*

(A) *discuss various cost share structures, including the cost share structure in place prior to such date of enactment and the cost share structure in place under paragraph (7), and the effect of such cost share structures on individual Centers and the overall program; and*

(B) *include a recommendation for how best to structure the cost share requirement after fiscal year 2015 to provide for the long-term sustainability of the program.*

* * * * *

(e) MEP ADVISORY BOARD.—

(1) * * *

* * * * *

[(4) FEDERAL ADVISORY COMMITTEE ACT.—In discharging its duties under this subsection, the MEP Advisory Board shall function solely in an advisory capacity, in accordance with the Federal Advisory Committee Act.]

(4) FEDERAL ADVISORY COMMITTEE ACT APPLICABILITY.—

(A) IN GENERAL.—*In discharging its duties under this subsection, the MEP Advisory Board shall function solely in an advisory capacity, in accordance with the Federal Advisory Committee Act.*

(B) EXCEPTION.—*Section 14 of the Federal Advisory Committee Act shall not apply to the MEP Advisory Board.*

* * * * *

(g) *INNOVATIVE SERVICES INITIATIVE.*—

(1) *ESTABLISHMENT.*—*The Director may establish, within the Centers program under this section, an innovative services initiative to assist small- and medium-sized manufacturers in—*

(A) *reducing their energy usage and environmental waste to improve profitability; and*

(B) *accelerating the domestic commercialization of new product technologies, including components for renewable energy systems.*

(2) *MARKET DEMAND.*—*The Director may not undertake any activity to accelerate the domestic commercialization of a new product technology under this subsection unless an analysis of market demand for the new product technology has been conducted.*

(h) *REPORTS.*—

(1) *IN GENERAL.*—*In submitting the 3-year programmatic planning document and annual updates under section 23, the Director shall include an assessment of the Director’s governance of the program established under this section.*

(2) *CRITERIA.*—*In conducting such assessment, the Director shall use the criteria established pursuant to the Malcolm Baldrige National Quality Award under section 17(d)(1)(C) of the Stevenson-Wydler Technology Innovation Act of 1980 (15 U.S.C. 3711a(d)(1)(C)).*

(i) *DEFINITION.*—*In this section, the term “community college” means an institution of higher education (as defined under section 101(a) of the Higher Education Act of 1965 (20 U.S.C. 1001(a))) at which the highest degree that is predominately awarded to students is an associate’s degree.*

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SEC. 28. TECHNOLOGY INNOVATION PROGRAM.

(a) * * *

* * * * *

(k) *TIP ADVISORY BOARD.*—

(1) * * *

* * * * *

[(4) *ADVISORY CAPACITY.*—*In discharging its duties under this subsection, the TIP Advisory Board shall function solely in an advisory capacity, in accordance with the Federal Advisory Committee Act.*]

(4) *FEDERAL ADVISORY COMMITTEE ACT APPLICABILITY.*—

(A) *IN GENERAL.*—*In discharging its duties under this subsection, the TIP Advisory Board shall function solely in an advisory capacity, in accordance with the Federal Advisory Committee Act.*

(B) *EXCEPTION.*—*Section 14 of the Federal Advisory Committee Act shall not apply to the TIP Advisory Board.*

* * * * *

SEC. 34. BIOSCIENCE RESEARCH PROGRAM.

(a) *IN GENERAL.*—*The Director shall establish a bioscience research program to support research and development of standard reference materials, measurements, methods, and genomic and other data to advance—*

- (1) *biological drug research and development;*
 - (2) *molecular diagnostics;*
 - (3) *medical imaging technologies; and*
 - (4) *personalized medicine.*
- (b) **UNIVERSITY RESEARCH CENTERS.**—
- (1) **ESTABLISHMENT.**—*The Director may establish research centers at institutions of higher education (in this section referred to as “university research centers”) through a competitive application process to conduct research that furthers the objectives of the bioscience research program.*
 - (2) **APPLICATION.**—
 - (A) **IN GENERAL.**—*An institution of higher education seeking to establish a university research center under this subsection shall submit an application to the Director at such time, in such manner, and containing such information and assurances as the Director may require.*
 - (B) **COMPONENTS.**—*The application shall include, at a minimum, a description of—*
 - (i) *the relevant research and instructional capacity of the applicant;*
 - (ii) *the research projects that will be undertaken by the applicant;*
 - (iii) *the extent to which the applicant will partner with industry and the role industry will play in the research undertaken by the university research center;*
 - (iv) *how the applicant will disseminate research results effectively; and*
 - (v) *the metrics that will be used to evaluate the success of the projects under clause (ii) and the contribution of the university research center in furthering the objectives of the bioscience research program.*
 - (C) **SPECIAL CONSIDERATION.**—*The Director shall give special consideration to an application from an institution of higher education that is—*
 - (i) *an 1890 Institution, as defined in section 2 of the Agricultural Research, Extension, and Education Reform Act of 1998 (7 U.S.C. 7061);*
 - (ii) *a Predominantly Black Institution, as defined in section 318 of the Higher Education Act of 1965 (20 U.S.C. 1059e);*
 - (iii) *a part B institution, as defined in section 322 of the Higher Education Act of 1965 (20 U.S.C. 1061);*
 - (iv) *a Tribal College or University, as defined in section 316 of the Higher Education Act of 1965 (20 U.S.C. 1059c);*
 - (v) *a Native American-serving, nontribal institution, as defined in section 319 of the Higher Education Act of 1965 (20 U.S.C. 1059f);*
 - (vi) *an Asian American and Native American Pacific Islander-serving institution, as defined in section 320 of the Higher Education Act of 1965 (20 U.S.C. 1059g);*
 - (vii) *an Alaska Native-serving institution, as defined in section 317 of the Higher Education Act of 1965 (20 U.S.C. 1059d);*

(viii) a Native Hawaiian-serving institution, as defined in section 317 of the Higher Education Act of 1965 (20 U.S.C. 1059d); or

(ix) a Hispanic-serving institution, as defined in section 502 of the Higher Education Act of 1965 (20 U.S.C. 1101a).

(3) ASSESSMENT.—Not later than 3 years after the date on which a university research center is established and every 3 years thereafter, the Director shall evaluate the university research center for its contributions to the bioscience research program.

(4) ANNUAL MEETING.—If the Director establishes more than 1 university research center, the Director shall convene an annual meeting of researchers from all of the university research centers and the Institute to foster collaboration and communication.

(c) USER FACILITY.—The Director may establish a bioscience user facility to provide access to advanced or unique equipment, services, materials, and other resources to industry, institutions of higher education, nonprofit organizations, and government agencies to perform research and testing.

(d) POSTDOCTORAL FELLOWS.—The Director shall, to the extent practicable, assign 1 or more fellows from the postdoctoral fellowship program established in section 19 to the bioscience research program.

(e) PROGRAMMATIC PLANNING DOCUMENT.—The Director shall ensure that the updates to the programmatic planning document transmitted to Congress under section 23(d) include the bioscience research program.

(f) DEFINITIONS.—In this section:

(1) BIOSCIENCE RESEARCH PROGRAM.—The term “bioscience research program” means the research and development program authorized under subsection (a).

(2) INSTITUTION OF HIGHER EDUCATION.—The term “institution of higher education” has the same meaning given the term in section 101(a) of the Higher Education Act of 1965 (20 U.S.C. 1001(a)).

SEC. [34.] 35. This Act may be cited as the National Institute of Standards and Technology Act.

TITLE 5, UNITED STATES CODE

* * * * *

PART III—EMPLOYEES

* * * * *

SUBPART D—PAY AND ALLOWANCES

* * * * *

CHAPTER 53—PAY RATES AND SYSTEMS

* * * * *

SUBCHAPTER II—EXECUTIVE SCHEDULE PAY RATES

* * * * *

§ 5314. Positions at level III

Level III of the Executive Schedule applies to the following positions, for which the annual rate of basic pay shall be the rate determined with respect to such level under chapter 11 of title 2, as adjusted by section 5318 of this title:

Solicitor General of the United States.

* * * * *

Under Secretary of Commerce for Standards and Technology, who also serves as Director of the National Institute of Standards and Technology.

Associate Attorney General.

* * * * *

§ 5315. Positions at level IV

Level IV of the Executive Schedule applies to the following positions, for which the annual rate of basic pay shall be the rate determined with respect to such level under chapter 11 of title 2, as adjusted by section 5318 of this title:

Deputy Administrator of General Services.

* * * * *

[Director, National Institute of Standards and Technology, Department of Commerce.]

* * * * *

STEVENSON-WYDLER TECHNOLOGY INNOVATION ACT OF 1980

* * * * *

SEC. 24. OFFICE OF INNOVATION AND ENTREPRENEURSHIP.

(a) *IN GENERAL.*—The Secretary shall establish an Office of Innovation and Entrepreneurship to foster innovation and the commercialization of new technologies, products, processes, and services with the goal of promoting productivity and economic growth in the United States.

(b) *DUTIES.*—The Office of Innovation and Entrepreneurship shall be responsible for—

(1) *developing and advocating policies to accelerate innovation and advance the commercialization of research and development, including federally funded research and development;*

(2) *identifying existing barriers to innovation and commercialization, including access to capital and other resources, and ways to overcome those barriers;*

(3) *providing access to relevant data, research, and technical assistance on innovation and commercialization;*

(4) *strengthening collaboration on and coordination of policies relating to innovation and commercialization within the Department of Commerce and between the Department of Commerce and other Federal agencies, as appropriate; and*

(5) *any other duties as determined by the Secretary.*

(c) *ADVISORY COMMITTEE.*—The Secretary shall establish an Advisory Council on Innovation and Entrepreneurship to provide advice to the Secretary on carrying out subsection (b).

SEC. 25. FEDERAL LOAN GUARANTEES FOR INNOVATIVE TECHNOLOGIES IN MANUFACTURING.

(a) *ESTABLISHMENT.*—The Secretary shall establish a program to provide loan guarantees for obligations to small- or medium-sized manufacturers for the use or production of innovative technologies.

(b) *ELIGIBLE PROJECTS.*—A loan guarantee may be made under such program only for a project that reequips, expands, or establishes a manufacturing facility in the United States to—

(1) use an innovative technology or an innovative process in manufacturing; or

(2) manufacture an innovative technology product or an integral component of such product.

(c) *ELIGIBLE BORROWER.*—A loan guarantee may be made under such program only for a borrower who is a small- or medium-sized manufacturer, as determined by the Secretary under the criteria established pursuant to subsection (m).

(d) *LIMITATION ON AMOUNT.*—A loan guarantee shall not exceed an amount equal to 80 percent of the obligation, as estimated at the time at which the loan guarantee is issued.

(e) *LIMITATIONS ON LOAN GUARANTEE.*—No loan guarantee shall be made unless the Secretary determines that—

(1) there is a reasonable prospect of repayment of the principal and interest on the obligation by the borrower;

(2) the amount of the obligation (when combined with amounts available to the borrower from other sources) is sufficient to carry out the project;

(3) the obligation is not subordinate to other financing;

(4) the obligation bears interest at a rate that does not exceed a level that the Secretary determines appropriate, taking into account the prevailing rate of interest in the private sector for similar loans and risks; and

(5) the term of an obligation requires full repayment over a period not to exceed the lesser of—

(A) 30 years; or

(B) 90 percent of the projected useful life, as determined by the Secretary, of the physical asset to be financed by the obligation.

(f) *DEFAULTS.*—

(1) *PAYMENT BY SECRETARY.*—

(A) *IN GENERAL.*—If a borrower defaults (as defined in regulations promulgated by the Secretary and specified in the loan guarantee) on the obligation, the holder of the loan guarantee shall have the right to demand payment of the unpaid amount from the Secretary.

(B) *PAYMENT REQUIRED.*—Within such period as may be specified in the loan guarantee or related agreements, the Secretary shall pay to the holder of the loan guarantee the unpaid interest on and unpaid principal of the obligation as to which the borrower has defaulted, unless the Secretary finds that there was no default by the borrower in the payment of interest or principal or that the default has been remedied.

(C) *FORBEARANCE.*—Nothing in this subsection precludes any forbearance by the holder of the obligation for the benefit of the borrower which may be agreed upon by the parties to the obligation and approved by the Secretary.

(2) *SUBROGATION.*—

(A) *IN GENERAL.*—If the Secretary makes a payment under paragraph (1), the Secretary shall be subrogated to the rights, as specified in the loan guarantee, of the recipient of the payment or related agreements including, if appropriate, the authority (notwithstanding any other provision of law) to—

(i) complete, maintain, operate, lease, or otherwise dispose of any property acquired pursuant to such loan guarantee or related agreement; or

(ii) permit the borrower, pursuant to an agreement with the Secretary, to continue to pursue the purposes of the project if the Secretary determines that such an agreement is in the public interest.

(B) *SUPERIORITY OF RIGHTS.*—The rights of the Secretary, with respect to any property acquired pursuant to a loan guarantee or related agreements, shall be superior to the rights of any other person with respect to the property.

(3) *ACTION BY ATTORNEY GENERAL.*—

(A) *NOTIFICATION.*—If the borrower defaults on an obligation, the Secretary shall notify the Attorney General of the default.

(B) *RECOVERY.*—On notification, the Attorney General shall take such action as is appropriate to recover the unpaid principal and interest.

(g) *PAYMENT OF PRINCIPAL AND INTEREST BY SECRETARY.*—With respect to any obligation guaranteed under this section, the Secretary may enter into a contract to pay, and pay, holders of the obligation for and on behalf of the borrower from funds appropriated for that purpose the principal and interest payments that become due and payable on the unpaid balance of the obligation if the Secretary finds that—

(1)(A) the borrower is unable to make the payments and is not in default;

(B) it is in the public interest to permit the borrower to continue to pursue the project; and

(C) the probable net benefit to the Federal Government in paying the principal and interest will be greater than that which would result in the event of a default;

(2) the amount of the payment that the Secretary is authorized to pay shall be no greater than the amount of principal and interest that the borrower is obligated to pay under the obligation being guaranteed; and

(3) the borrower agrees to reimburse the Secretary for the payment (including interest) on terms and conditions that are satisfactory to the Secretary.

(h) *TERMS AND CONDITIONS.*—A loan guarantee under this section shall include such detailed terms and conditions as the Secretary determines appropriate to—

(1) protect the interests of the United States in the case of default; and

(2) have available all the patents and technology necessary for any person selected, including the Secretary, to complete and operate the project.

(i) *CONSULTATION.*—In establishing the terms and conditions of a loan guarantee under this section, the Secretary shall consult with the Secretary of the Treasury.

(j) *FEES.*—

(1) *IN GENERAL.*—The Secretary shall charge and collect fees for loan guarantees in amounts the Secretary determines are sufficient to cover applicable administrative expenses.

(2) *AVAILABILITY.*—Fees collected under this subsection shall—

(A) be deposited by the Secretary into the Treasury of the United States; and

(B) remain available until expended, subject to such other conditions as are contained in annual appropriations Acts.

(k) *RECORDS.*—

(1) *IN GENERAL.*—With respect to a loan guarantee under this section, the borrower, the lender, and any other appropriate party shall keep such records and other pertinent documents as the Secretary shall prescribe by regulation, including such records as the Secretary may require to facilitate an effective audit.

(2) *ACCESS.*—The Secretary and the Comptroller General of the United States, or their duly authorized representatives, shall have access to records and other pertinent documents for the purpose of conducting an audit.

(l) *FULL FAITH AND CREDIT.*—The full faith and credit of the United States is pledged to the payment of all loan guarantees issued under this section with respect to principal and interest.

(m) *REGULATIONS.*—The Secretary shall issue final regulations before making any loan guarantees under the program. Such regulations shall include—

(1) criteria that the Secretary shall use to determine eligibility for loan guarantees under this section, including—

(A) whether a borrower is a small- or medium-sized manufacturer; and

(B) whether a borrower demonstrates that a market exists for the innovative technology product, or the integral component of such product, to be manufactured, as evidenced by written statements of interest from potential purchasers;

(2) policies and procedures for selecting and monitoring lenders and loan performance; and

(3) any other policies, procedures, or information necessary to implement this section.

(n) *AUDIT.*—

(1) *ANNUAL INDEPENDENT AUDITS.*—The Secretary shall enter into an arrangement with an independent auditor for annual evaluations of the program under this section.

(2) *ANNUAL REVIEW.*—The Comptroller General shall conduct an annual review of the Secretary's execution of the program under this section.

(3) *REPORT.*—The results of the independent audit under paragraph (1) and the Comptroller General's review under paragraph (2) shall be provided directly to the Committee on

Science and Technology of the House of Representatives and the Committee on Commerce, Science, and Transportation of the Senate.

(o) *REPORT TO CONGRESS.*—Concurrent with the submission to Congress of the President’s annual budget request in each year after the date of enactment of this section, the Secretary shall transmit to the Committee on Science and Technology of the House of Representatives and the Committee on Commerce, Science, and Transportation of the Senate a report containing a summary of all activities carried out under this section.

(p) *COORDINATION AND NONDUPLICATION.*—To the maximum extent practicable, the Secretary shall ensure that the activities carried out under this section are coordinated with, and do not duplicate the efforts of, other loan guarantee programs within the Federal Government.

(q) *MEP CENTERS.*—The Secretary may use centers established under section 25 of the National Institute of Standards and Technology Act (15 U.S.C. 278k) to provide information about the program established under this section and to conduct outreach to potential borrowers, as appropriate.

(r) *MINIMIZING RISK.*—The Secretary shall promulgate regulations and policies to carry out this section in accordance with Office of Management and Budget Circular No. A-129, entitled “Policies for Federal Credit Programs and Non-Tax Receivables”, as in effect on the date of enactment of this section.

(s) *SENSE OF CONGRESS.*—It is the sense of Congress that no loan guarantee shall be made under this section unless the borrower agrees to use a federally-approved electronic employment eligibility verification system to verify the employment eligibility of—

(1) all persons hired during the contract term by the borrower to perform employment duties within the United States; and

(2) all persons assigned by the borrower to perform work within the United States on the project.

(t) *DEFINITIONS.*—In this section:

(1) *COST.*—The term “cost” has the meaning given such term under section 502 of the Federal Credit Reform Act of 1990 (2 U.S.C. 661a).

(2) *INNOVATIVE PROCESS.*—The term “innovative process” means a process that is significantly improved as compared to the process in general use in the commercial marketplace in the United States at the time the loan guarantee is issued.

(3) *INNOVATIVE TECHNOLOGY.*—The term “innovative technology” means a technology that is significantly improved as compared to the technology in general use in the commercial marketplace in the United States at the time the loan guarantee is issued.

(4) *LOAN GUARANTEE.*—The term “loan guarantee” has the meaning given such term in section 502 of the Federal Credit Reform Act of 1990 (2 U.S.C. 661a). The term includes a loan guarantee commitment (as defined in section 502 of such Act (2 U.S.C. 661a)).

(5) *OBLIGATION.*—The term “obligation” means the loan or other debt obligation that is guaranteed under this section.

(6) *PROGRAM.*—The term “program” means the loan guarantee program established in subsection (a).

(u) AUTHORIZATION OF APPROPRIATIONS.—

(1) COST OF LOAN GUARANTEES.—There are authorized to be appropriated \$50,000,000 for each of fiscal years 2011 through 2015 to provide the cost of loan guarantees under this section.

(2) PRINCIPAL AND INTEREST.—There are authorized to be appropriated such sums as are necessary to carry out subsection (g).

SEC. 26. REGIONAL INNOVATION PROGRAM.

(a) ESTABLISHMENT.—The Secretary shall establish a regional innovation program to encourage and support the development of regional innovation strategies, including regional innovation clusters.

(b) REGIONAL INNOVATION CLUSTER GRANTS.—

(1) IN GENERAL.—As part of the program established under subsection (a), the Secretary may award grants on a competitive basis to eligible recipients for activities relating to the formation and development of regional innovation clusters.

(2) PERMISSIBLE ACTIVITIES.—Grants awarded under this subsection may be used for activities determined appropriate by the Secretary, including the following:

(A) Feasibility studies.

(B) Planning activities.

(C) Technical assistance.

(D) Developing or strengthening communication and collaboration between and among participants of a regional innovation cluster.

(E) Attracting additional participants to a regional innovation cluster.

(F) Facilitating market development of products and services developed by a regional innovation cluster, including through demonstration, deployment, technology transfer, and commercialization activities.

(G) Developing relationships between a regional innovation cluster and entities or clusters in other regions.

(3) ELIGIBLE RECIPIENT.—For purposes of this subsection, the term “eligible recipient” means any of the following:

(A) A State.

(B) An Indian tribe.

(C) A city or other political subdivision of a State.

(D) An entity that—

(i) is a nonprofit organization, an institution of higher education, a public-private partnership, or an economic development organization or similar entity; and

(ii) has an application that is supported by a State or a political subdivision of a State.

(E) A consortium of any of the entities listed in subparagraphs (A) through (D).

(4) APPLICATION.—

(A) IN GENERAL.—An eligible recipient shall submit an application to the Secretary at such time, in such manner, and containing such information and assurances as the Secretary may require.

(B) COMPONENTS.—The application shall include, at a minimum, a description of the regional innovation cluster supported by the proposed activity, including a description of the following:

(i) Whether the regional innovation cluster is supported by the private sector, State and local governments, and other relevant stakeholders.

(ii) How the existing participants in the regional innovation cluster will encourage and solicit participation by all types of entities that might benefit from participation, including newly formed entities and those rival to existing participants.

(iii) The extent to which the regional innovation cluster is likely to stimulate innovation and have a positive impact on regional economic growth and development.

(iv) Whether the participants in the regional innovation cluster have access to, or contribute to, a well-trained workforce.

(v) Whether the participants in the regional innovation cluster are capable of attracting additional funds from non-Federal sources.

(vi) The likelihood that the participants in the regional innovation cluster will be able to sustain activities once grant funds under this subsection have been expended.

(5) *COST SHARE.*—The Secretary may not provide more than 50 percent of the total cost of any activity funded under this subsection.

(6) *USE AND APPLICATION OF RESEARCH AND INFORMATION PROGRAM.*—To the maximum extent practicable, the Secretary shall ensure that activities funded under this subsection use and apply any relevant research, best practices, and metrics developed under the program established in subsection (c).

(c) *REGIONAL INNOVATION RESEARCH AND INFORMATION PROGRAM.*—

(1) *IN GENERAL.*—As part of the program established under subsection (a), the Secretary shall establish a regional innovation research and information program to—

(A) gather, analyze, and disseminate information on best practices for regional innovation strategies (including regional innovation clusters), including information relating to how innovation, productivity, and economic development can be maximized through such strategies;

(B) provide technical assistance, including through the development of technical assistance guides, for the development and implementation of regional innovation strategies (including regional innovation clusters);

(C) support the development of relevant metrics and measurement standards to evaluate regional innovation strategies (including regional innovation clusters), including the extent to which such strategies stimulate innovation, productivity, and economic development; and

(D) collect and make available data on regional innovation cluster activity in the United States, including data on—

(i) the size, specialization, and competitiveness of regional innovation clusters;

(ii) the regional domestic product contribution, total jobs and earnings by key occupations, establishment

size, nature of specialization, patents, Federal research and development spending, and other relevant information for regional innovation clusters; and

(iii) supply chain product and service flows within and between regional innovation clusters.

(2) *RESEARCH GRANTS.*—The Secretary may award research grants on a competitive basis to support and further the goals of the program established under this subsection.

(3) *DISSEMINATION OF INFORMATION.*—Data and analysis compiled by the Secretary under the program established in this subsection shall be made available to other Federal agencies, State and local governments, and nonprofit and for-profit entities.

(4) *CLUSTER GRANT PROGRAM.*—The Secretary shall incorporate data and analysis relating to any regional innovation cluster supported by a grant under subsection (b) into the program established under this subsection.

(d) *INTERAGENCY COORDINATION.*—

(1) *IN GENERAL.*—To the maximum extent practicable, the Secretary shall ensure that the activities carried out under this section are coordinated with, and do not duplicate the efforts of, other programs at the Department of Commerce or other Federal agencies.

(2) *COLLABORATION.*—The Secretary shall explore and pursue collaboration with other Federal agencies, including through multiagency funding opportunities, on regional innovation strategies.

(e) *EVALUATION.*—

(1) *IN GENERAL.*—Not later than 4 years after the date of enactment of this section, the Secretary shall enter into a contract with an independent entity, such as the National Academy of Sciences, to conduct an evaluation of the program established under subsection (a).

(2) *REQUIREMENTS.*—The evaluation shall include—

(A) whether such program is achieving its goals;

(B) any recommendations for how such program may be improved; and

(C) a recommendation as to whether such program should be continued or terminated.

(f) *REGIONAL INNOVATION CLUSTER DEFINED.*—The term “regional innovation cluster” means a geographically bounded network of similar, synergistic, or complementary entities that—

(1) are engaged in or with a particular industry sector;

(2) have active channels for business transactions and communication;

(3) share specialized infrastructure, labor markets, and services; and

(4) leverage the region’s unique competitive strengths to stimulate innovation and create jobs.

(g) *AUTHORIZATION OF APPROPRIATIONS.*—There are authorized to be appropriated such sums as are necessary for each of fiscal years 2011 through 2015 to carry out this section, including such sums as are necessary to carry out the evaluation required under subsection (e).

ENERGY POLICY ACT OF 2005

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**TITLE IX—RESEARCH AND
DEVELOPMENT**

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Subtitle G—Science

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[SEC. 977. SYSTEMS BIOLOGY PROGRAM.**[(a) PROGRAM.—**

[(1) ESTABLISHMENT.—The Secretary shall establish a research, development, and demonstration program in microbial and plant systems biology, protein science, computational biology, and environmental science to support the energy, national security, and environmental missions of the Department.

[(2) GRANTS.—The program shall support individual researchers and multidisciplinary teams of researchers through competitive, merit-reviewed grants.

[(3) CONSULTATION.—In carrying out the program, the Secretary shall consult with other Federal agencies that conduct genetic and protein research.

[(b) GOALS.—The program shall have the goal of developing technologies and methods based on the biological functions of genomes, microbes, and plants that—

[(1) can facilitate the production of fuels, including hydrogen in sustainable production systems that reduce greenhouse gas emissions;

[(2) convert carbon dioxide to organic carbon;

[(3) detoxify soils and water, including at facilities of the Department, contaminated with heavy metals and radiological materials;

[(4) develop cellulosic and other feedstocks that are less resource and land intensive and that promote sustainable use of resources, including soil, water, energy, forests, and land, and ensure protection of air, water, and soil quality; and

[(5) address other Department missions as identified by the Secretary.

[(c) PLAN.—

[(1) DEVELOPMENT OF PLAN.—Not later than 1 year after the date of enactment of this Act, the Secretary shall prepare and transmit to Congress a research plan describing how the program authorized pursuant to this section will be undertaken to accomplish the program goals established in subsection (b).

[(2) REVIEW OF PLAN.—The Secretary shall contract with the National Academy of Sciences to review the research plan developed under this subsection. The Secretary shall transmit the review to Congress not later than 18 months after transmittal of the research plan under paragraph (1), along with the Secretary's response to the recommendations contained in the review.

[(d) USER FACILITIES AND ANCILLARY EQUIPMENT.—Within the funds authorized to be appropriated pursuant to this subtitle, amounts shall be available for projects to develop, plan, construct, acquire, or operate special equipment, instrumentation, or facilities, including user facilities at National Laboratories, for researchers conducting research, development, demonstration, and commercial application in systems biology and proteomics and associated biological disciplines.

[(e) PROHIBITION ON BIOMEDICAL AND HUMAN CELL AND HUMAN SUBJECT RESEARCH.—

[(1) NO BIOMEDICAL RESEARCH.—In carrying out the program under this section, the Secretary shall not conduct biomedical research.

[(2) LIMITATIONS.—Nothing in this section shall authorize the Secretary to conduct any research or demonstrations—

[(A) on human cells or human subjects; or

[(B) designed to have direct application with respect to human cells or human subjects.

[(f) BIOENERGY RESEARCH CENTERS.—

[(1) ESTABLISHMENT OF CENTERS.—In carrying out the program under subsection (a), the Secretary shall establish at least 7 bioenergy research centers, which may be of varying size.

[(2) GEOGRAPHIC DISTRIBUTION.—The Secretary shall establish at least 1 bioenergy research center in each Petroleum Administration for Defense District or Subdistrict of a Petroleum Administration for Defense District.

[(3) GOALS.—The goals of the centers established under this subsection shall be to accelerate basic transformational research and development of biofuels, including biological processes.

[(4) SELECTION AND DURATION.—

[(A) IN GENERAL.—A center under this subsection shall be selected on a competitive basis for a period of 5 years.

[(B) REAPPLICATION.—After the end of the period described in subparagraph (A), a grantee may reapply for selection on a competitive basis.

[(5) INCLUSION.—A center that is in existence on the date of enactment of this subsection—

[(A) shall be counted towards the requirement for establishment of at least 7 bioenergy research centers; and

[(B) may continue to receive support for a period of 5 years beginning on the date of establishment of the center.]

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XX. COMMITTEE RECOMMENDATIONS

On April 28, 2010, the Committee on Science and Technology favorably reported H.R. 5116 by a recorded vote of 29–8 and recommended its enactment.

The Honorable Bart Gordon
May 5, 2010
Page 2

Thank you for your attention to this matter, and for the cooperative working relationship between our two committees.

Sincerely,



Handwritten signature of George Miller in black ink.

GEORGE MILLER
Chairman

cc: The Honorable Nancy Pelosi, Speaker of the House
The Honorable John Kline, Senior Republican Member of the Education and Labor Committee
The Honorable Ralph M. Hall, Ranking Republican Member of the Science and Technology Committee
The Honorable John Sullivan, Parliamentarian

BART GORDON, TENNESSEE
CHAIRMAN

RALPH M. HALL, TEXAS
RANKING MEMBER

U.S. HOUSE OF REPRESENTATIVES
COMMITTEE ON SCIENCE AND TECHNOLOGY

SUITE 2321 RAYBURN HOUSE OFFICE BUILDING
WASHINGTON, DC 20515-6301
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May 6, 2010

The Honorable George Miller
Chairman
Committee on Education and Labor
U.S. House of Representatives
2181 Rayburn House Office Building
Washington, D.C. 20515

Dear Chairman Miller:

Thank you for your May 5, 2010 letter regarding H.R. 5116, the America COMPETES Reauthorization Act of 2010. Your support for this legislation and your assistance in ensuring its timely consideration are greatly appreciated.

I agree that provisions in the bill are within the jurisdiction of the Committee on Education and Labor. I acknowledge that by waiving rights to further consideration of H.R. 5116, your Committee is not relinquishing its jurisdiction and I will fully support your request to be represented in a House-Senate conference on those provisions over which the Committee on Education and Labor has jurisdiction in H.R. 5116, or similar legislation. A copy of our letters will be placed in the legislative report and the *Congressional Record* during consideration of the bill on the House floor.

I value your cooperation and look forward to working with you as we move ahead with this important legislation.

Sincerely,



BART GORDON
Chairman

cc: The Honorable Nancy Pelosi, Speaker
The Honorable Ralph M. Hall, Ranking Member
The Honorable John Kline, Ranking Member,
Committee on Education and Labor
The Honorable John Sullivan, Parliamentarian

XXII. ADDITIONAL/DISSENTING VIEWS

DISSENTING VIEWS OFFERED BY REPRESENTATIVES: RALPH M. HALL, LAMAR SMITH, FRANK D. LUCAS, TODD AKIN, MARIO DIAZ-BALART, ADRIAN SMITH AND PETE OLSON

Signed into law by President George W. Bush in August 2007, the original America COMPETES Act was developed and passed with bipartisan support in response to consensus recommendations by the business and academic communities regarding the most important steps the Nation could take to enhance long-term economic competitiveness through investments in science and technology.

We continue to support this organizing principle of the America COMPETES Act, as well as its underlying recommendations to prioritize and strengthen investments in basic research and development and science, technology, engineering, and mathematics (STEM) education. These policies, together with a broader economic policy that includes lower taxes, adherence to market principles, streamlined Federal regulation, and attendance to the budget deficit and national debt, form the policy basis of what is necessary for the country to truly remain competitive into the future.

Accordingly, we strongly support many of the programs and activities called for in H.R. 5116, the America COMPETES Reauthorization Act of 2010, and commend Chairman Gordon for his leadership on this important topic. However, we remain concerned due to fundamental objections with the legislation, including excessive spending levels, creation of numerous new unnecessary or duplicative programs, and a policy shift away from the focus on innovation-enabling basic research that formed the cornerstone of the original America COMPETES Act and the National Academies' *Rising Above the Gathering Storm* report from which it evolved.

Specifically, our overriding objections include the following:

- Overall authorization levels of nearly \$84 billion—\$20 billion in new funding above the fiscal year 2010 base, and almost \$6 billion above the ten-year doubling path for the National Science Foundation, Department of Energy Office of Science, and National Institute of Standards and Technology.

- Increased authorization length from three to five years, limiting Committee oversight opportunities and calling for extensive out-year funding increases without regard to the current and future fiscal situations.

- Creation of at least seven new programs, several of which fund activities well beyond research and development, many of which are duplicative or unnecessary, and all of which will dilute funding available for priority basic research.

During the full committee markup of the legislation, Republicans offered 39 amendments, most aimed to address concerns in the

aforementioned areas. While some amendments were accepted and allowed for improvement to the legislation, those addressing the fundamental concerns of reducing the authorization levels, eliminating new programs, and “righting” policy shifts in the bill were squarely and repeatedly rejected. For these reasons, we are unable to support the bill as reported by the full committee.

We remain committed to authorizing America COMPETES through targeted legislation that takes into full account the current fiscal situation and outlook, and will continue to work to improve the bill as it moves to the House floor and through the legislative process.

NATIONAL SCIENCE FOUNDATION & STEM EDUCATION

We remain committed to a robust authorization for basic research and education at the National Science Foundation (NSF). From a policy perspective, we are pleased to see the focus at NSF remain on basic research, however the addition of a new innovative prize program could signal an emphasis on applied research which is an area correctly not included in NSF’s mission. The elimination of a broad range of schools at which teachers are permitted to use their Noyce Scholarship experience is disappointing, despite efforts to put in place incentives for them to teach in “high needs” schools. We support the goal that all American students should reap the benefits of these highly skilled teachers. We are not supportive of continuing unfunded programs in this legislation like the Partnership for Access to Science Laboratories pilot program.

As expressed during the original COMPETES authorization in 2007, we acknowledge a need for a STEM education program at the Department of Energy (DOE), however, multiple programs that go beyond the purpose of educating and training DOE’s future workforce is unwarranted.

NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY

A reorganization of the laboratories at the National Institute of Standards and Technology (NIST) requires proper oversight to ensure it is beneficial to the needs of the Nation. For that reason we echo our desire to shorten the authorization period for the legislation to three years. We believe the elevation of the Director of NIST to an Under Secretary position will provide NIST with more recognition within the Department of Commerce.

We maintain that including biosciences as an area of emphasis for NIST under this legislation is unnecessary as NIST already has the authority and is conducting such research. Driving NIST to create university research centers and a new user facility at this time forces the Director to utilize funds in an inefficient and redundant manner.

INNOVATION

While we are steadfast in our support of a robust base of innovation and manufacturing in the United States, we remain concerned with the language in the legislation creating programs for manufacturing loan guarantees and regional innovation centers at the Department of Commerce. Both of these programs call for funding

new activities well beyond research and development. Given budget realities, new funding for these programs will effectively dilute funding available for priority research activities at the Department of Commerce—primarily those at NIST. Further, the eligible activities and entities in both programs are vaguely defined, and thus particularly vulnerable to potentially inappropriate or duplicative activities. While attempts by Republicans to strike these programs were rejected, we are pleased that some efforts to incorporate additional taxpayer protections were accepted, such as the adoption of an amendment requiring that the loan guarantee eligibility criteria include proof that a market exists for the product for which the loan guarantee is being requested, and an amendment to ensure the Department of Commerce develop the program in accordance with existing Office of Management and Budget guidelines.

DEPARTMENT OF ENERGY

In 2007, we expressed concern over the establishment of the Advanced Research Projects Agency (ARPA-E), arguing that the creation of such an agency modeled on the Department of Defense DARPA program would not translate effectively to the energy sector and had the potential to create an unnecessary bureaucracy at the Department of Energy. We recognize the benefit that “creative, out of the box, transformational research” may provide to the country; however, we find language in the current legislation repealing certain statutory protections limiting the breadth and scope of the ARPA-E organization troubling. The elimination of a ceiling on the number of employees the Director of ARPA-E may hire, coupled with the desire to fashion an independent staff of legal counsel, contracting specialists, and program directors in our interpretation moves ARPA-E in the direction of a new Department and not a nimble, targeted, responsive program.

Further, we are concerned that the new “Energy Innovation Hubs” program created by the legislation is unnecessary and will be significantly redundant with existing activities throughout the Department. In the case of the Office of Science, this will result in a disconcerting policy shift away from the longstanding focus of the Office on priority basic research in the energy sciences and toward more applied research and technology development.

RALPH M. HALL.
LAMAR SMITH.
FRANK D. LUCAS.
W. TODD AKIN.
MARIO DIAZ-BALART.
PETE OLSON.
ADRIAN SMITH.

ADDITIONAL VIEWS OF REPRESENTATIVES INGLIS,
McCAUL, BARTLETT, EHLERS, BIGGERT, AND BILBRAY

We support the COMPETES Reauthorization Act as a continued commitment to long-term economic competitiveness and strong science and technology programs in U.S. government, academia, and industry, and we cheer Chairman Gordon and Ranking Member Hall for their leadership in this effort. The National Academies' *Rising Above the Gathering Storm* report provided several recommendations about increasing and targeting investments in research and development and education that formed the core of COMPETES in 2007. As we reauthorize this landmark legislation, it is important to again evaluate and prioritize our investments.

BASIC RESEARCH

Several provisions associated with the National Science Foundation (NSF) and the Office of Science at the Department of Energy (DOE) indicate a substantial shift away from foundational, long-term research. In a commendable push to bring more research and development breakthroughs to the consumer market more quickly, we feel that this legislation may draw resources and attention away from the basic research work that will sustain American competitiveness over the long term. The Committee should try to more clearly balance an obvious short term desire for a burst of technological innovation with a reliable supply of emerging scientific breakthroughs that fuel our economic engine. We are troubled that the current Administration may be losing sight of the necessity to continue to fuel the pipeline of innovation with basic research.

NEW PROGRAMS

In the 2010 COMPETES Reauthorization, the majority has created a number of new programs intended to accelerate and bring to market technological progress. The Energy Innovation Hubs at the DOE may certainly improve collaboration in key areas of inquiry, and may lay the groundwork for U.S. leadership in new energy technologies. Still, as currently conceived, the Hubs would replicate some of the work already ongoing at the Department and result in duplicative efforts. This reauthorization also adds a bioscience research program at the National Institutes of Standards and Technology (NIST). It seems that this language is redundant with ongoing work at NIST and will drive redundant and inefficient investments in this program and accompanying university research centers. We cannot support the creation of new programs that will build redundancy into the missions of these critical agencies and cause excessive inefficiency in research investments. Adding duplication to federal efforts is counter to the intention of the COMPETES reauthorization.

INNOVATION TITLE

The 2010 COMPETES Reauthorization includes a new title which purports to accelerate innovation. We are troubled that this title strays from the original recommendations of the Rising Above the Gathering Storm report to improve our competitiveness. While a federal loan guarantee program and regional innovation program may not be bad ideas, they are not affiliated with the report's recommendations and these new programs could have used a more thorough vetting process before our Committee.

CLIMATE RESEARCH PROVISIONS

We value and depend on accurate assessments of the behavior of and changes to our climate, and we acknowledge DOE's work in this area. However, we question the necessity or utility of including climate research provisions at the DOE Office of Science Biological and Environmental Research Program in this reauthorization. Inclusion of climate research programs confuses the intent of this bill and improperly emphasizes the importance of climate science in our roadmap to a powerfully competitive economy.

AUTHORIZATION LEVELS

The Rising Above the Gathering Storm report contained specific recommendations to increase and target funding for some of our most important research programs. Increasing the resources available to these programs, and to our national labs, academic institutions, and research partnerships in pursuit of foundational, transformative breakthroughs is an important part of our plan for economic competitiveness. We hope that while we grapple with a struggling economy, we balance our enthusiasm for these programs with sensible fiscal restraint. In this fiscal environment, we hope these authorization levels convey that importance we place on scientific and technical progress for the success of the U.S. on an international stage.

BOB INGLIS.
BRIAN P. BILBRAY.
MICHAEL T. McCAUL.
JUDY BIGGERT.
VERNON J. EHLERS.
ROSCOE G. BARTLETT.

DISSENTING VIEWS OFFERED BY REPRESENTATIVE
ROHRBACHER

The theoretical purpose of the America COMPETES Act is to enhance long-term economic competitiveness through investments in science and technology. I support this laudable goal, as I have for more than 21 years as a member of the Committee on Science and Technology, including 10 years as a Subcommittee Chairman. But I cannot support this legislation which, simply put, authorizes too much funding in too many wrong-headed ways.

While I'm certain this bill was drafted with the best intentions and motivations, I agree with many of the Dissenting Views as stated by Ranking Member Hall and others, specifically that:

. . . [national investments] in basic research and development and science, technology, engineering, and mathematics (STEM) education . . . together with a broader economic policy that includes lower taxes, adherence to market principles, streamlined Federal regulation, and attendance to the budget deficit and national debt, form the policy basis of what is necessary for the country to truly remain competitive into the future.

But this point must be stated clearly and forcefully: we cannot enhance our long-term competitiveness by mortgaging the future of our children and grandchildren.

That is precisely what this legislation does by authorizing \$84 billion, a 31% increase above the FY 2010 baseline. That increase must add to our deficit—money we are borrowing from China and other foreign nations. There is no sense of prioritization, and no attempt at increasing efficiencies or at restructuring programs that would be expected in a reauthorization bill of this size and complexity. This legislation just adds new spending on top of old.

At the same time, the Majority refused to accept common-sense amendments to increase revenue through ownership rights and technology developed with government funds and to make certain that these funds don't go overseas to foreign competitors. If we finance foreign researchers who return home with their new-found results, then we should rename this the America DEPLETES Act.

Creating new federal programs should always be done with caution and oversight. Establishing them in a time of economic downturn by increasing deficit spending will reduce productivity and economic activity. This legislation creates many new programs which are unnecessary and wasteful, increasing deficits while reducing the advancement opportunities for our nation.

Spending more, borrowing more, taxing more, and running up the deficit at a record pace over the past year have not helped grow the economy or reverse the economic outlook for America. I had hoped that the Majority would change course and begin to work in a responsible way to promote job creation and economic growth in

both the near-term and long-term. This legislation shows how much that hope was misplaced.

DANA ROHRBACHER.

DISSENTING VIEWS OFFERED BY REPRESENTATIVE PAUL
BROUN

The Reauthorization calls for excessive spending levels, the creation of numerous new unnecessary or duplicative programs, and a policy shift away from the focus on innovation-enabling basic research that formed the cornerstone of the original America COMPETES Act of 2007 and the National Academies' Rising Above the Gathering Storm report from which it evolved.

Specifically, I have three main concerns. First, the overall authorization levels approach \$84 billion, which represents \$20 billion in new funding above the fiscal year 2010 base, and almost \$6 billion above the ten-year doubling path for the National Science Foundation, Department of Energy Office of Science, and National Institute of Standards and Technology. Secondly, increasing the out year funding and the authorization length from three to five years limits the Committee's oversight opportunities without regard to the current and future fiscal situations. Lastly, the creation of at least seven new programs, which fund activities well beyond research and development and are duplicative, will dilute funding available for priority basic research.

During the full committee markup of the legislation, my Republican colleagues and I offered 39 amendments, mostly addressing concerns in the aforementioned areas. While some amendments were accepted and allowed for improvement to the legislation, those addressing the fundamental concerns of reducing the authorization levels, eliminating new programs, and "righting" policy shifts in the bill were repeatedly rejected. For those reasons, I am unable to support the bill as reported by the full committee.

PAUL C. BROUN.

**XXIII. PROCEEDINGS OF THE MARKUP BY
THE SUBCOMMITTEE ON ENERGY AND EN-
VIRONMENT ON COMMITTEE PRINT, DE-
PARTMENT OF ENERGY OFFICE OF
SCIENCE AUTHORIZATION ACT OF 2010;
ARPA-E REAUTHORIZATION ACT OF 2010;
AND ENERGY INNOVATION HUBS AUTHOR-
IZATION ACT OF 2010**

THURSDAY, MARCH 25, 2010

HOUSE OF REPRESENTATIVES,
SUBCOMMITTEE ON ENERGY AND ENVIRONMENT,
COMMITTEE ON SCIENCE AND TECHNOLOGY,
Washington, DC.

The Subcommittee met, pursuant to call, at 10:06 a.m., in Room 2318 of the Rayburn House Office Building, Hon. Brian Baird [Chairman of the Subcommittee] presiding.

Chairman BAIRD. Good morning. This hearing will come to order pursuant to notice. The Subcommittee on Energy and Environment meets to consider the following measure, the Committee Print for the Department of Energy. I recognize myself for an opening statement.

I want to welcome everyone to today's Energy and Environment Subcommittee markup. It is the first of three Subcommittee markups, leading to Full Committee consideration of the reauthorization of the America COMPETES Act. Today we have before us a Committee Print comprised of three titles. The intention is for these three titles to make up the bulk of the Department of Energy's research program in America COMPETES.

Title I is a comprehensive authorization of the Department's Office of Science. This is language from H.R. 4905, a bill I introduced with my colleague from Illinois and long-time champion of the Office of Science and the National Laboratories, Ms. Biggert, and I thank her for her input and collaboration on this.

The Office of Science is the single largest supporter of basic research in the physical sciences in the United States with a current budget of roughly \$5 billion. It is one of three agencies that the America COMPETES Act set on a doubling path following on the recommendation of the National Academy's report, *Rising Above the Gathering Storm*. It has a diverse portfolio of advanced R&D facilities, including everything from supercomputers to x-ray light sources. Last year these facilities were used by more than 22,000 researchers from universities, national laboratories, private industry, and other federal science agencies, enabling our Nation's best and brightest to examine new materials for a wide range of industrial energy research applications.

If adopted, this legislation will provide the first comprehensive authorization of the Office of Science and will keep it on the funding path set forth in the first COMPETES Act.

Title II of the print is the reauthorization of the Advanced Research Projects Agency for Energy, or ARPA-E, which mirrors the language from H.R. 4906, introduced by the Committee Chairman, Mr. Gordon. I, again, commend him for his leadership in what I personally believe will be one of the landmark achievements of this committee for many years to come.

In addition to extending the authorizations, Mr. Gordon makes a handful of important additions to the underlying statute to further ensure it remains the independent and agile program it was intended to be. ARPA-E received its first appropriation last year, and thanks to the efforts of Dr. Majumdar and his all-star staff the program hit the ground running and funded over 37 energy research projects. We expect to see continuing great things from this program and having participated in their summit just a couple of weeks ago, it is a strikingly positive development on this front.

Title III follows H.R. 4907, introduced by Mr. Carnahan, Ms. Giffords, and Mr. Tonko, in authorizing the new Energy Innovation Hubs as proposed by Energy Secretary Chu in 2009. Modeled largely after Bell Labs and the Bioenergy Research Centers, the Hubs are intended to foster a highly-collaborative working environment that brings together many fields of expertise to overcome scientific barriers to our Nation's most critical energy challenges.

Spanning the full gamut from the most basic research all the way to commercial applications, these three programs represent the forefront of our Nation's effort to lead the world in the development and production of technologies for a clean energy economy.

I also want to emphasize that the language in this legislation is the result of multiple hearings on all of the key fronts, and we have, if anyone is interested, a listing of all the many hearings we have held in anticipation of this legislation and a direct point-by-point analysis of where the outcome and input from those hearings is reflected in the bill.

I understand that many colleagues, several colleagues have a number of amendments, and I look forward to a healthy discussion, but also I hope we will move with some alacrity as we move forward with this legislation.

With that I turn it over to my colleague and friend from South Carolina, Mr. Inglis, for his opening statement.

[The prepared statement of Chairman Baird follows:]

PREPARED STATEMENT OF CHAIRMAN BRIAN BAIRD

Good Morning. I Want to welcome everyone to today's Energy & Environment Subcommittee Markup. This is the first of three Subcommittee markups leading to the Full Committee's consideration of the reauthorization of the America COMPETES Act.

Today we have before us a Committee Print comprised of three titles. The intention is for these three titles to make up the bulk of the Department of Energy's research programs in COMPETES.

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is one of three agencies that the America COMPETES Act set on a doubling path following on the recommendations of the National Academies report, "Rising Above the Gathering Storm."

It has a diverse portfolio of advanced R&D facilities, including everything from supercomputers to x-ray light sources. Last year, these facilities were used by more than 22,000 researchers from universities, national laboratories, private industry, and other Federal science agencies—enabling our nation's best and brightest to examine new materials for a wide range of industrial and energy research applications.

This title authorizes some of the most significant research activities of the Office of Science. If adopted, it will provide the first comprehensive authorization of the Office of Science, and will keep it on the funding path set forth in the first COMPETES Act.

Title II of the Print is a reauthorization of the Advanced Research Projects Agency—Energy, or ARPA-E, which mirrors the language from H.R. 4906 introduced by Chairman Gordon. In addition to extending the authorizations, Mr. Gordon makes a handful of important additions to the underlying statute to further ensure it remains the independent and agile program it was intended to be.

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I understand my colleagues have a number of amendments, and I look forward to a healthy discussion as we move forward with this legislation.

With that I will turn it over to my colleague from South Carolina, Mr. Inglis, for his opening statement.

Mr. INGLIS. Thank you, Mr. Chairman, and thank you for holding this markup as we get ready to reauthorize the America COMPETES Act. Today we will look at three components of that effort at the Department of Energy, the Office of Science, ARPA-E, and the new Energy Innovation Hubs Initiative.

The Office of Science at DOE has a long history of transformative foundational research work that underpins our understanding of nature and opens the door to major advancements in energy technologies and national security. In support of this mission this committee laid out a doubling track for the Office of Science in the 2007, Authorization of America COMPETES. As we again address this critical office, I hope to raise a few points of concern.

First, it seems we are encouraging the Office of Science to move away from its foundational research focus and towards the development of marketable technologies. I am concerned that an emphasis on technology development will overrun and diminish the critical basic discovery science mission.

Second, this Committee Print places considerable emphasis on climate observations and modeling. While this work will support strong energy policy decisions, it has little bearing on the technological competitiveness of the United States and seems misplaced in this COMPETES legislation.

Next, we will turn to ARPA-E. I am a big believer in this new program and the flexible, aggressive approach it takes to developing market-ready, transformative technologies. The early success of ARPA-E grant solicitations was very encouraging, and I can ap-

preciate the enthusiasm behind the 10-year authorization for this program as included in the language.

At the same time I think it is important that we give the program more time to show its successes and limitation and hesitate to offer it such a lengthy authorization.

Finally, this language includes Energy Innovation Hubs. This is a new initiative recommended by Secretary Chu and is intended to create breakthroughs in particularly troublesome areas of energy technology.

I hope to ask a few clarifying questions about this section during the hearing. Before we begin, I want to raise my concern that this program may duplicate ongoing work at DOE.

Mr. Chairman, I look forward—as I look at the authorization bills, authorization levels in this bill, I can't help but think that we are letting our enthusiasm for these programs get the better of us. While robust funding for critical work at the Department of Energy is necessary and a long-term commitment of this subcommittee, now is certainly the time to exercise fiscal restraint and fiscal responsibility.

Again, I want to thank you for holding this markup. I look forward to working with you on legislation, and I yield back the balance of my time.

Chairman BAIRD. I thank the gentleman. Does anyone else wish to be recognized?

The Chairman, Mr. Gordon, is recognized for five minutes.

Mr. GORDON. Thank you, Mr. Chairman. Let me say first that Mr. Inglis raises some very valid questions, and I think we will have a good discussion on that. I won't take time to do that now.

What I would like to do is thank the Members of this committee and the staff that have worked so hard in a bipartisan way with so many hearings. This is a very, very important piece of legislation on its own and will help America in terms of our energy independence, in terms of our competitiveness, and I think in what can be a real export market for us.

But it is also a major portion of the America COMPETES Act, which we will be dealing with later. Let me—and also I want to acknowledge, I don't know if mistake is the right term, we will call it whatever, the—we have a responsibility to get the questions from the Members to the panelists for responses, those questions that could not be raised during the hearing. It was an error on our part in not forwarding those. It is not—all you got to do is just push the button and send them on over. So they are out. They have not had time to get back, but they will be back well before we do the final markup, and I want to acknowledge to those folks that had questions that, again, that mistake was made, we are in the process of correcting it, and they will have plenty of time to review it before the full hearing.

Thank you, Mr. Chairman.

Chairman BAIRD. I thank the Chair. Anyone else wish to be recognized?

Chairman BAIRD. If not, then I ask unanimous consent that the print is considered as read and open to amendment at any point.

Chairman BAIRD. Let the Members proceed with the amendments in the order of the roster.

Without objection, so ordered.

The first amendment on the roster is a manager's amendment offered by the Chair. The clerk will report the amendment.

The CLERK. Amendment number 002, amendment to the Committee Print offered by Mr. Baird of Washington.

Chairman BAIRD. I ask unanimous consent to dispense with the reading.

Without objection, so ordered.

I recognize myself for five minutes to explain the amendment.

The manager's amendment makes a series of changes throughout Title I of the Committee Print to clarify the intent of the legislation and to incorporate recent recommendations from stakeholders.

In addition, this amendment incorporates some good suggestions put forward by the Minority, and we thank everyone for those contributions.

Several provisions of the amendment provide a clear explanation of research items for the office. This includes research activities in the Biological and Environmental Research programs, as well as for basic energy sciences, advanced scientific computing, and fusion energy research.

Additionally, we made several technical corrections.

I ask my colleagues to support the amendment. Is there further discussion on the amendment?

The Chair recognizes Mr. Inglis.

Mr. INGLIS. Mr. Chairman, I wonder if this might be a good time for me to ask questions of counsel on Office of Science, Title I. Is that all right to dispense with that at this point?

To get some questions about Title I, about the Office of Science. So in existing law the Systems Biology Program permits research to the production of fuels including hydrogen. The language included in the draft does not include any mention of hydrogen. The language has been rewritten to this, "increased cost effective, sustainable production of biomass-based liquid transportation fuels, bioenergy, and bio-based products that minimize greenhouse gas emissions."

Is it the intent of this draft that hydrogen fuels no longer be included and be considered part of the program? Is that the intent of the drafting of this?

COUNSEL. No, that is not the intent.

Mr. INGLIS. So any reason that the specific mention of hydrogen is taken out, or is it—do you feel that it is effectively covered in the language that is in there?

COUNSEL. We do feel that it is effectively covered.

Mr. INGLIS. So let us think about that. Increased—cost effective, sustainable production, biomass-based liquid transportation fuels. I am not sure hydrogen fits in there. Right? That is one source of hydrogen. That is one way to get it. Another would be, for example, reforming natural gas, but maybe you are trying to exclude that, because reform natural gas doesn't fit there. Right?

COUNSEL. The Biological Systems Science Program in this bill is specifically focused on the biological side, so the reforming through natural gas would probably be in a different program.

Mr. INGLIS. So I wonder if it is—what I am concerned about is we limit the options out there in hydrogen research, and we don't

want to do that, or I certainly don't want to do that. So there are opportunities, all kinds of ways to create the hydrogen sources. It is just—we want to—I think we seem to be limiting it here. Is that right?

COUNSEL. I am sorry. Could you repeat the question?

Mr. INGLIS. Well, I am sort of rambling. It is—I guess—

Chairman BAIRD. Would the gentleman yield for a second?

Mr. INGLIS. Yeah.

Chairman BAIRD. I am actually sympathetic to this line of questioning, and I am wondering if there may not be time to—I personally think we ought to make sure that hydrogen has a strong role broadly through the bill, and if there are biological—if I recall, and my memory may not be correct, there are other elements of the bill that do address hydrogen, but if the gentleman is of the belief that we should—we don't want to have a sin of omission by not including hydrogen, I think I would certainly—we don't have an amendment before us today, but before the bill moves to Full Committee I would certainly urge us to work with the gentleman and see what we could do on that. At least include it as an option, not necessarily a mandate but an option for research.

Would that be satisfactory? Does the staff have—I yield back but—

COUNSEL. We have no issues with that. I would also point out that there is research related to fuel cells within the Basic Energy Sciences Program and that includes hydrogen.

Mr. INGLIS. Okay. So I guess your point to me is that—my question here relates to the Systems Biology Program, and you are saying that this is—that is why it is so geared toward bio kind of sources rather than all the other sources of hydrogen.

Okay, but I appreciate the Chairman's interest in making sure that we don't diminish the importance of pursuing hydrogen.

And then the second question I have for you, in existing law biomedical research, including research on human cells or human subjects, is prohibited. The draft language omits a similar provision. Is this because the language aims to expand the scope of the program to biomedical research, or is there some other reason for this omission?

COUNSEL. No, it does not plan on expanding the scope of the Bio Systems Science Program. It was omitted because we were trying to clean up the language, and we thought that that provision wasn't necessary at this time.

Mr. INGLIS. So what—how are we going to make sure to have protection against research on human cells or human subjects? I mean, wouldn't it be better to make that explicit than to be silent?

COUNSEL. The counsel doesn't have an objection to that at all.

Mr. INGLIS. To making it explicit that we are not doing human subjects.

COUNSEL. That is correct.

Mr. INGLIS. Human cells.

Chairman BAIRD. Would the gentleman yield?

I just—maybe that is something we should discuss. I am not—I want to make sure that we are not—let me give examples. I don't think anybody is talking about using human cells to generate energy resources, but I wouldn't want to preclude if there were—if

this system were to have some analysis of the affects of something on a human system, I don't want to inadvertently block that, you know. If somebody were to say, for example, how does some products we are producing affect human beings? That we don't inadvertently say—now, that is different than sort of biological research on the human body, but I just want to run that by counsel if—what is your take on that?

COUNSEL. I could point out, the origin of biological research within the Office of Science is actually the effects of radiation on people.

Chairman BAIRD. I am aware of that, and our hearing raised that very issue, which is why I am reticent to be as amenable to this particular amendment.

Mr. INGLIS. I am with you, Mr. Chairman. I agree with you that you don't want to stop that kind of research you were just talking about because it would be—that would be problematic.

I think the challenge that we are noticing is in current law we have this explicit prohibition, but on the reauthorization we are removing that. It seems to me that raises the possibility that this is intentional or that someone can argue that.

COUNSEL. It is not intentional, and we did not imply that it should be something that is continued. In fact, in the budget the Department of Energy has phased out the one specific program that does do medical kinds of applications.

Mr. INGLIS. So as we go forward, maybe with the Chairman's—I agree with the Chairman. We don't want to limit what he—the research he was talking about, but I think it is important that we not set up any presumption by the removal of language from the existing bill, and it seems wise to me to maintain that language rather than omit it.

So perhaps we can work on that as we go forward, and I thank you for letting me exceed my time here.

Chairman BAIRD. Is there further discussion?

If no, the vote occurs on the amendment. All in favor, say aye. Those opposed, say no. The ayes have it, and the amendment in agreed to.

The second amendment on the roster is an amendment offered by the gentleman from Michigan, Dr. Ehlers. Dr. Ehlers, are you ready to proceed with your amendment?

Mr. EHLERS. Yes. I have an amendment at the desk.

Chairman BAIRD. The clerk will report the amendment.

The CLERK. Amendment number 034, amendment to the Committee Print offered by Mr. Ehlers of Michigan.

Chairman BAIRD. I ask unanimous consent to dispense with the reading.

Without objection, so ordered.

I recognize the gentleman for five minutes to explain his amendment.

Mr. EHLERS. Thank you, Mr. Chairman. My amendment would strike the first portion of Section 103, the Office of Science activities, and insert a clear description of the Office of Science's mission and duties as described by the Office itself.

My amendment would make clear that the activities of the Office of Science should focus on basic research as they have ever since the Department of Energy was formed. In fact, even before the De-

partment of Energy was formed, and it was operated by the Atomic Energy Commission. It was always understood their primary focus would be basic research.

I understand that the current language in the bill is included in Energy Policy Act of 2005, however, I do not believe that the inclusion of demonstration and commercial application activities actually reflects what the DOE's Office of Science does. In fact, DOE reports to NSF that they conduct entirely basic research each year, and the Office of Science is the single largest supporter of basic research in the physical sciences in the United States.

So I am basically urging that we maintain that language which has traditionally been in there, that the Office of Science's mission and duties will be primarily in the area of basic research.

Chairman BAIRD. The gentleman yield back the time?

Mr. EHLERS. Yes.

Chairman BAIRD. I will recognize myself for five minutes in response.

As always the gentleman from Michigan offers some very thoughtful and constructive suggestions. My only hesitation would be that we had a number of witnesses testify at hearings about the importance of finding ways to move from the basic research into actual applied and production, and a number of witnesses at least testified that while we don't want to lose our emphasis on basic research, at least being more cognizant and putting some more attention on the production side is important. We have seen multiple examples where U.S. driven basic research doesn't yield production here but actually production overseas. So we fund innovation and the jobs go somewhere else.

And so I want to be cognizant of that, and so I am inclined to accept the gentleman's amendment but with the caveat that since we have only had relatively little time to look at that, we want to reserve the right to discuss with the gentleman, possibly modify that before final—before the vote goes to final.

Mr. EHLERS. Will the gentleman yield?

Chairman BAIRD. Yes, I would be happy to yield.

Mr. EHLERS. Just in response to that, first of all, I emphasize that the focus should be on basic research. It would not preclude doing other things.

Secondly, I think, you know, and we discussed this briefly before the meeting, and I would have to go back, but my memory is that the Department of Energy has in the past had cooperative agreements that they have developed with entrepreneurs, with corporations and so forth, that when there is a practical application, then they develop a relationship between the Department and the corporation to work together on the proper application of the ideas that the basic research has developed and make them marketable in various ways.

So I do not object to the Department cooperating that way. I am just worried about changing the focus as has been changed in the bill.

Chairman BAIRD. The gentleman's point—

Mr. EHLERS. I am sure we could work together on developing good language that would be acceptable to everyone.

Chairman BAIRD. I am certain we can. The gentleman's point is well taken.

Ms. Biggert, I am happy to yield to you.

Ms. BIGGERT. Thank you, Mr. Chairman. I think I probably have a very similar question, and I just put it into terms where it actually happens, and that would be many of our labs do work with industry and in testing products that the industry wants to, you know, go forward with, and I would hate to see that that wouldn't be able to happen. And we also have what we call the Valley of Death, which is something where, you have got the product, you have got the demonstration, but a company is not able to push it out into the community, and I think at some point we should really have more discussion on that. I know in some of the hearings it has been discussed, but how are we to—is there any way that we can help really to move those forward, if we want to keep the innovation and the creativity going. So many times we lose so many products that that doesn't happen that way.

So I want to make sure that we don't lose that opportunity.

Chairman BAIRD. I share the gentlelady's concern.

I am happy to yield to Mr. Garamendi.

Mr. GARAMENDI. I think it is very, very important that we maintain this transitional role for the Department. The basic science has been conducted in an extraordinary way and with great success in all of these various areas. It is that next step from the basic science to the application of it that is very, very important.

I want to give a specific example. Part of this has to do with fusion power, either the NIF facility or one of the others. The next step at the NIF, assuming you get ignition and all the work that NIF needs to do, it could lead to fusion power. The—that moves from basic science to commercialization, and it is that transition, and that is just one of numerous examples that we find.

So I think it is really important that the Department have the opportunity and frankly the explicit obligation to take that next step. Now, the application or the money to do it is another matter, but without the authorization, the money won't follow and will not be available.

And so I really think the language as written is appropriate.

Chairman BAIRD. Is there further discussion?

Mr. Luján is recognized for five minutes.

Mr. LUJÁN. Thank you, Mr. Chairman.

Dr. Ehlers, I very much appreciate the thought behind the flexibility as mentioned to Chairman Baird. My concerns are along the same line as Mr. Garamendi, and even yesterday we had a hearing with a panel that included investors, those that are involved with some of the universities, research institutions, and representatives from the Administration, that talked about the importance of making sure that when we have these scientific discoveries that we are able to push them a little bit. And it seems that that is one of the areas of frustration with some of the small businesses that I have engaged with as well in many of these areas.

And the CRADA is the Cooperative Research and Development Agreements. What we saw in the 1990s is that there was utilization of these CRADAs, but it decreased as we approached 2000 and 2001 because of some of those constraints, and I could not agree

more that that is a vehicle that we need to go back to look at to see how we can increase that capacity.

But I am very hesitant to take away the encouragement or the incentive to push it forward, and I would be happy to yield to Mr. Ehlers for any comments.

Mr. EHLERS. I thank the gentleman for yielding.

Let us remember what the purpose of the amendment is. We are talking here just about the Office of Science, and that has traditionally been focused on basic research, and I am just trying to make sure we don't lose that. That does not preclude the rest of the Department, which, of course, is much larger than the Office of Science from doing the sorts of the things that you have described and which they have traditionally done.

I do think, however, and Chairman Baird, I think, would agree with this, that we should find out what they did in the past in terms of working with industry, because I know they have developed working relationships. They had, used to have a standard contractual procedure. I don't know if it is still there or not.

So it doesn't preclude their continuing to do what they have done. It is just simply saying the focus of the Office of Science is basic research. Out of that springs all the other things that they can apply in various areas.

Mr. LUJÁN. Thank you, Mr. Chairman. My concern is that the Department of Energy does not engage in the activities necessary to push the technology out, and we can have these grand ideas and these phenomenal technological advances where there are spin-offs off of ideas that we can't even imagine what the results can yield, but we can't push them out. And that is my concern with DOE; it seems that they sit on the shelf instead of helping advance commercialization or manufacturing here in the United States for job creation, which is a focus of mine. And coming from a district that has a few of the national laboratories in it and understanding how we need—as I stated earlier, to push this forward as opposed to pull back.

So I appreciate learning more from you, Mr. Chairman, and from Mr. Ehlers.

Mr. EHLERS. Yeah, and this does not preclude that from continuing to happen.

Mr. LUJÁN. Thank you, Mr. Chairman. I yield back my time.

Chairman BAIRD. Thank you, Mr. Luján.

Any on the Minority side wish to be recognized?

Mr. Gordon wanted to be.

Mr. Inglis, did you want to be recognized?

Mr. INGLIS. Well, I just—yes, Mr. Chairman, thank you. Just to make the point that the Office of Science here we are talking about in this bill is \$35.77 billion, ARPA-E is 3.4 billion, and then the Hubs are .85 billion, 850 million, I guess.

And it is—I think Dr. Ehlers makes a good point that we had this tension between wanting to do basic research, which is so crucial to get breakthroughs, and I think that everybody on this committee probably believes that that is an important role of our government in figuring out how to fund this basic research because nobody else is going to do it. It is not necessarily going to reach commercial application, and therefore, if you are trying to justify your

shareholders' investment in it, you are just not going to be able to do it. So that is why we are so big on basic research.

But we are also, as the gentleman was just saying, we are into getting advances in the economy, and so there is this tension between wanting to do basic research but yet wanting to commercialize it. I think Dr. Ehlers is just making the very good point, though, that in the—when we are talking about the Office of Science, we have historically been talking about basic research, we want to keep them focused on that, because there is no telling what will come out of it.

Sort of like the Neutrino experiments that we saw at the South Pole. We have really no idea what is going to come out of that. There is no commercial application in sight, but it may help us understand energy that we don't understand at this point. And so we wouldn't want to siphon off money into immediate quarterly profit kind of motivation and pass out Neutrino experimentation at the South Pole as an example. I am not sure that is covered by this—actually funding comes out of this, but that is the kind of thing that we are—I think Dr. Ehlers is focusing on.

Am I saying that right, Dr. Ehlers?

Mr. EHLERS. Thank you for yielding. I just want to say, yes, that is correct. The whole intent here is to continue to operate the Office of Science the way it has been operating, which is basic research. There are other arms of working with industry, developing new ideas, more applied research is done elsewhere in DOE and not in, primarily in the Office of Science.

So I am—just want to make sure that we are not by default changing the focus of the Office of Science by this bill, but we are maintaining the focus of the Office of Science in basic research, and we will continue all the other activities as they have been doing and will continue to do.

Mr. LUJÁN. Would the gentleman yield, Mr. Inglis?

Mr. INGLIS. I am sorry. I would be happy to yield.

Mr. LUJÁN. Thank you. Although I am reluctant to support this amendment, if I could get some assurance that we could work on some language, either in this legislation or down the road, that we could create a mechanism understanding that there has been a decrease in commercialization activity and the complexities associated with licensing going forward to move this technology out of DOE, wherever that basic science may be, I think I would be more inclined with supporting this amendment, seeing how we could work on that vehicle to get this moving.

Mr. INGLIS. Happy to yield to Dr. Ehlers.

Mr. EHLERS. I am fine.

Mr. GORDON. Would the gentleman yield? If the gentleman would yield. Listening to this discussion I think that we are remarkably in sync. We are all singing the same song, maybe just a little bit, you know, different. Clearly, we all recognize as Dr. Ehlers' point out, that the primary responsibility in the Office of Science, and I think across the Department of Energy, is basic research, but as Ms. Biggert points out, we need to keep an eye to that—getting through the Valley of Death with technology transfer. And as Mr. Baird points out, we certainly don't want to be, you know, developing some type of, again, new research that then is taken offshore.

So I think we are all in sync. I think that Dr. Ehlers' amendment is in that spirit. I would suggest that we accept it and that I am sure he would be—if we have to word it a little bit, you know, between now and Full Committee, you know, that is fine, but I think he is representative of what we all feel is correct.

Mr. INGLIS. Thank you, Mr. Chairman. I yield back.

Chairman BAIRD. Further discussion?

The one final thing I would say is I intend to support it, but I really do want to underscore that I think there is a strong sense that has been expressed by the Committee that we do want to—while we maintain the focus on basic research, we do want also—personally those researchers who benefit from this money, and \$5 billion is a serious chunk of change, it dwarfs ARPA-E, for example, and we face major, multiple challenges on our energy front. I personally want to put a marker down in this bill strongly and throughout the reauthorization of COMPETES that we value and respect the basic research, but we have some real-world problems we got to address, and we want those basic researchers to address those real-world problems. Among those real-world problems is employing the American people and solving our energy needs.

And so I want to make sure that we keep that focus on basic research but with a peripheral vision at the very least of how—what it means.

Mr. EHLERS. Yeah. No disagreement.

Mr. GORDON. Mr. Chairman, happy to yield.

Mr. GARAMENDI. I understand where Dr. Ehlers is going, but the specific language of his amendment uses the word basic, and there is no other word to give direction to the Department that its task is more than basic research, and so if we accept his amendment, we ought to modify it so that the Chairman's point about the application of that basic research is somehow incorporated in this.

Otherwise the current Director of this Department is instructed very clearly. It is basic, and there is nothing more in the language. So I think we need to broaden if we are going to go down with route with the acceptance of the amendment.

Mr. EHLERS. Will the gentleman yield?

Mr. GARAMENDI. Certainly.

Mr. EHLERS. First, let me point out that the word used is focus. It doesn't say that is all they can do. That is their primary focus as it has been.

Furthermore, we chose that language very carefully because that is precisely what is in the President's budget bill that they sent and described the function of the Office of Science and referred specifically to the focus on basic research.

So we are basically continuing with what has always been there and what the President has talked about in his budget.

Mr. GARAMENDI. I see my task of modifying what exists today. I didn't come here to stay where we were yesterday but rather to move to tomorrow, and we, in my view we have to take this basic science and move it into the commercial sector, and there are numerous ways to do that, and focus is still even more precise, you shall focus on this.

I think we need to get the words, this transition, into the language of the purpose of the Office.

Chairman BAIRD. What might be constructed is rather than trying to wordsmith it in detail here, which we could do, but this is Subcommittee markup. We are going to be going to Full Committee with the consent of the Chairman who spoke earlier. We might be able to revisit this issue in that interim if Mr. Ehlers is amenable, and rather than trying to wordsmith it here, the sense of Dr. Ehlers to keep that attention there but, Mr. Garamendi and I think many other Members of the Committee have spoken well on this, let's bring the amendment up to a vote at this point with the proviso that we will revisit this before it goes to full markup.

But, of course, if Members oppose that, they are free to vote nay, and that is obviously an option here as well.

Mr. GORDON. Mr. Chairman, if Mr. or Governor Garamendi would yield just a moment, part of the—we have been very strict about going through regular order on this committee, and that is letting the subcommittees have hearings, you know, we have subcommittee markups and then we will go to Full Committee, and that is really the purpose. I mean, this is, you know, a legitimate concern on both sides. It was raised, and as Chairman Baird said, I think we can work this out, but, again, this is the reason why it is good to have subcommittee markups to raise these issues, and we—I am sure we can get it worked out.

We are all on the same—we are all in good faith, I think, saying the same thing.

Mr. GARAMENDI. Well, I suppose that if this is going to go forward, I want to lay down a marker that says I think we ought to have this transition in the language for the Department, and you know, fine, we can accept the amendment, but I want to be very clear about the necessity of transition, and I recall well Dr. Ehlers' discussion about the Agricultural Extension Service and the way in which that operates in transitioning.

Now, so they got basic science and transition from the basic science and agriculture to the application of that in the real world, and I think we ought to make sure that, in my view, that needs to be part of the role of this office.

I want to lay down my own marker here about where I am coming from on this matter.

Chairman BAIRD. Hearing no further discussion, the vote occurs on the amendment. All those in favor will say aye. Opposed, no. No. The ayes have it, and the amendment is agreed to, and I will look forward to working with our colleagues to resolve these, I think very legitimate and important questions, and we will do that in the interim before the markup. So thank you for your input on this.

The third amendment on the roster is an amendment offered again by the gentleman from Michigan, Dr. Ehlers. Dr. Ehlers, are you ready to proceed with this amendment?

Mr. EHLERS. I am ready, and we can go very rapidly if no one has any questions on it.

Chairman BAIRD. The clerk will report the amendment, please.

The CLERK. Amendment number 033, amendment to the Committee Print offered by Mr. Ehlers of Michigan.

Chairman BAIRD. Ask unanimous consent to dispense with the reading.

Without objection, so ordered.

I recognize the gentleman from Michigan for five minutes to explain his amendment.

Mr. EHLERS. Once again this is a matter of language. We are trying to clarify what we are doing here and making an accord with the President's request, budget request.

Part of the role of this authorization is to codify the Energy Frontier Research Centers for the first time, and this amendment will align the authorization within this bill with the DOE description of the Energy Frontier Research Centers.

DOE's description of the centers in the budget states, "The EFRCs, that is the Energy Frontier Research Centers, harness the most basic and advanced discovery research in a concerted effort to accelerate the scientific breakthroughs needed to create advanced energy technologies for the 21st century. These centers bring together critical masses of researchers to conduct fundamental energy research in a new era of grand challenge science and use-inspired energy research."

And I might just insert here a comment that is basically what I believe a number of Members here are saying they would like to see.

Since technology development, demonstration, or commercial application is not mentioned as the purpose of the centers, it is clear to me that the frontier centers clearly are fundamental research projects. The bill should make that clear. My amendment would incorporate the language from the budget, so instead of saying on page 4, "to meet energy research development, demonstration, and commercial application needs identified in," the language would be amended to say, "to conduct fundamental and use inspired energy research to accelerate scientific breakthroughs related to needs identified in."

I—again, the whole idea is just to clarify and make sure that we are in sync with what the President has requested, what the Department has been doing and hopes to continue to be doing.

So I urge its adoption.

Chairman BAIRD. Thank the gentleman. Is there further discussion of the amendment?

Mr. Luján is recognized for five minutes.

Mr. LUJÁN. Mr. Chairman, thank you very much.

Just, again, to reiterate the same concerns that we brought up before and not to continue this discussion but look forward to looking at this as well to make sure that we find that vehicle going forward to support commercialization.

Thank you, Mr. Chairman.

Chairman BAIRD. Your point is well made yet again.

Further discussion?

Hearing none the motion or the vote occurs on the amendment. All in favor, say aye. Those opposed, no. In the opinion of the Chair the ayes have it. The amendment is agreed to.

The fourth amendment on the roster is an amendment offered by the gentleman from Illinois, Dr. Lipinski. Are you ready to proceed with your amendment?

Mr. LIPINSKI. I have an amendment at the desk.

Chairman BAIRD. The clerk will report the amendment.

The CLERK. Amendment number 058, amendment to the Committee Print offered by Mr. Lipinski of Illinois.

Chairman BAIRD. I ask unanimous consent to dispense with the reading.

Without objection, so ordered.

I recognize the gentleman for five minutes to explain this amendment.

Mr. LIPINSKI. Thank you, Chairman Baird, and I appreciate all the hard work that you and Chairman Gordon have put into this legislation that we are considering today. I would also like to thank Ranking Member Inglis and Congresswoman Biggert of Illinois for their work and leadership on this.

This legislation definitely is vital for long-term competitiveness for our country, and I am very proud to be a cosponsor of it.

This amendment is a small step toward improving U.S. manufacturing competitiveness. I don't need to tell anyone that American manufacturers are facing hard times. If we want to stop manufacturing jobs continuing to go overseas, we need to compete on innovation and quality. High-performance computing modeling and simulation tools help domestic manufacturers compete by reducing design cycle time and development costs, improving performance and efficiency, and reducing waste.

It is a potentially game-changing technology, a crucial domestic edge that can help build and sustain our manufacturing sector. The Office of Science has long been a leader in advanced scientific computing research, and indeed, many of our largest companies have sought out their expertise, forged productive partnerships, and built significant competitive advantages.

Companies like Proctor and Gamble, Boeing, and General Electric are taking advantage of national lab facilities, but too many manufacturers, especially small manufacturers, have no idea what tools and expertise are out there or even who to talk to at the national labs. This is an issue that has been brought to me by many manufacturers, and I think there is much more that we can do.

My amendment would help solve this problem by establishing an outreach program within the Advanced Computing Program. It would aim to build public-private partnerships between manufacturers and national labs, opening the door for a broad range of new collaborations.

So simply within the Advanced Computing Program to have this outreach program it would help to make many manufacturers aware of what is available and hopefully will help them to also compete better in the world economy. This is something, as I said, that many of the larger manufacturing companies take advantage of. I want to do all we can to broaden that, so I think this is a modest, commonsense step, and I ask my colleagues to support this amendment.

Chairman BAIRD. I thank the gentleman from Illinois.

Is there further discussion?

Mr. Garamendi.

Mr. GARAMENDI. A question on this. I agree totally with what is being proposed here, but my question relates to the role of the Director, and I think out of ignorance here I am asking a question of the Chair. The Director is responsible for overseeing specific lab-

oratories. I think there are ten labs that the Director oversees. There are other laboratories that are doing major computational science, and those are under the National Nuclear Security Agency. Livermore and Los Alamos are two that come immediately to mind.

They have the potential of playing a—the exact similar role, but because the—this is directed towards the other labs, not those labs, it would be, I think, in our interest to broaden this particular section to include or to allow the Director to work with the other laboratories to achieve a similar goal.

Chairman BAIRD. It is my understanding—I will defer to counsel on this, but it is my understanding that we really don't—if you are referring to the DOD, the jurisdictional issues of the other—

Mr. GARAMENDI. This is the Department of Energy laboratories, the National Nuclear Security labs. Or the agency oversees the Livermore Lab and the Los Alamos Lab that have great computing capabilities and could play a role similar to what is played here, and perhaps that ought to be in a different section, a different part of the COMPETES Bill.

But clearly those laboratories can play the same role that Mr. Lipinski is trying to achieve here.

Chairman BAIRD. There are just two quick issues on that, if I may.

One, the jurisdictional issue. We certainly don't want to write this bill in such a way that we get bounced into a DOD jurisdictional fight, which could happen I would imagine, but secondly, my understanding of that issue is there are some fairly significant security issues when one makes those assets available that are also present in the other but less so.

But I will defer—if counsel wants to address this in some way, I will defer to them.

COUNSEL. The Committee has jurisdiction over energy research, development, demonstration, and commercial application activities. The Committee does not have jurisdiction over national security activities within NNSA. That is the Armed Services Committee.

Mr. GARAMENDI. I think that is not the case. The—within the Department—do we have the Department of Energy?

COUNSEL. We have parts of the Department of Energy.

Mr. GARAMENDI. But not the national—

COUNSEL. Not the national security activities of the NNSA.

Mr. GARAMENDI. I will pursue this separate and apart.

Thank you very much.

Chairman BAIRD. Thank you, Mr. Garamendi. We will discuss that further.

Are there further discussion?

If not, the vote occurs on the amendment. All in favor, say aye. Those opposed, no. The ayes have it, and the amendment is agreed to.

The fifth amendment on the roster is an amendment offered by the gentleman from California, Mr. Garamendi. Are you ready to proceed with your amendment?

The clerk will report the amendment.

The CLERK. Amendment number 001, amendment to the Committee Print offered by Mr. Garamendi of California.

Mr. GARAMENDI. This amendment deals with the fusion power issues and specifically asks that the Director report back to us within 180 days of the completion of the study by the National Academy of Sciences.

In other words, we need to know, and so please tell us.

Chairman BAIRD. I appreciate the gentleman for his brevity. A commonsense request.

Is there further discussion with comparable brevity on the amendment?

That is the best. If no, then the vote occurs on the amendment. All in favor, say aye. Those opposed, no. The ayes have it. The amendment is agreed to.

The sixth amendment on the roster is an amendment offered by the gentleman from Illinois, Dr. Lipinski. Dr. Lipinski, are you ready to proceed with your amendment?

Mr. LIPINSKI. Yes. I have an amendment at the desk.

Chairman BAIRD. The clerk will report the amendment.

The CLERK. Amendment number 057, amendment to the Committee Print offered by Mr. Lipinski of Illinois.

Chairman BAIRD. I ask unanimous consent to dispense with the reading.

Without objection, so ordered.

I recognize the gentleman for five minutes to explain the amendment.

Mr. LIPINSKI. Thank you, Mr. Chairman.

The amendment at the desk will improve the implementation of the Science Laboratories Infrastructure Program created in this bill. All of us understand that the Office of Science laboratories are national assets that consistently deliver remarkable discoveries in scientific tools, but many of the buildings and facilities of the Office of Science laboratory system are reaching the end of their useful lives. We need to make sure that they can support the scientific mission of the Office of Science, that we are taking care of the investments we have already made, and that our national labs continue to be vital resources for academic and industrial scientists alike.

The Infrastructure Modernization Program will help address these concerns, and I am glad that it is part of this legislation. My amendment simply will require basic information about maintenance and infrastructure needs and associated funding requirements to be included in a report to Congress.

So simply this is about reporting. I think it will certainly be very helpful. It is critical to know what maintenance is needed, what the infrastructure needs are, the funding, just to have more information as we move forward on this.

So I ask for support of this simple yet important amendment, and I yield back.

Chairman BAIRD. Is there further discussion of the amendment?

Ms. Biggert.

Ms. BIGGERT. Thank you, Mr. Chairman. I would support this amendment. I think there are so many of the labs that really are in need of maintenance on their infrastructure, and sometimes that gets lost, you know, in the funding because it tends to be at the bottom of the list, and I think that we all know that no matter

what infrastructure, whether it is a lab or anything else, our houses or whatever, that you really need to take care of things as we move along and not wait until it is, you know, such a crucial element and much more expensive.

And I would support the amendment.

Chairman BAIRD. The gentlelady's point is well taken. We have had hearings here not only about the federal labs but about university labs, and I think it is symptomatic. We all want to do the new thing, and we don't maintain what we have got sometimes.

Further discussion?

Hearing none, the vote occurs on the amendment. All in favor, say aye. Those opposed, not. The ayes have it, and the amendment is agreed to.

The seventh amendment on the roster is an amendment offered by the gentleman from Michigan, Dr. Ehlers. Dr. Ehlers, are you ready to proceed with your amendment?

Mr. EHLERS. Yes. I have an amendment at the desk.

Chairman BAIRD. The clerk will report the amendment.

The CLERK. Amendment number 035, amendment to the Committee Print offered by Mr. Ehlers of Michigan.

Chairman BAIRD. Ask unanimous consent to dispense with the reading.

Without objection, so ordered.

I recognize the gentleman for five minutes to explain his amendment.

Mr. EHLERS. Thank you, Mr. Chairman.

This addresses an issue about setting authorizations in the bill, which is something that we normally have not done, and in particular my concern is there are certain authorizations established which are quite high and others are not set and presumed would continue at the previous rate.

Let me just get into some of the specifics here, and the wording specifics set aside to Congress is as exercising its right to establish priorities for research funding at the Department. However, I fear that we have overlooked the important contributions of nuclear physics, high-energy physics, and fusion energy sciences by not establishing authorizations for these programs.

The Nuclear Physics Program, for example, funds a workforce at our universities that is critical to any nuclear future, and I think most individuals who are concerned about electricity generation in the future regard nuclear as the best option at this point.

This committee is very intent on solving some of the challenges of nuclear waste and the fuel cycle, and there is no way we are going to be competitive in the arena unless we are educating students in this area.

Additionally, I am concerned that the precedent set here is one of Congress picking winners and losers. In the context of a five-year authorization, the Department may need flexibility to work within its overall authorization to adjust different programs year to year.

Consequently I believe that we will allow for the potential for the agency to be more competitive if we remove the specific authorization levels for any of these programs. My amendment would remove the set-aside authorizations from the bill entirely, remaining

silent on funding for the Office of Science except for the overall Office of Science authorization levels. This is what we have traditionally done.

Let me give some specific examples. I have here increases in BES, BER, and ASCR. That is the alphabet soup for various programs, but it specifies increases of 10.6 percent in authorization for 2012, 10.6 for 2013, 9.5 for 2014, 10.2 for 2015. Now, I would love to see this increase in authorizations, especially if it would lead to increase in appropriations.

But the cost is that we are holding the fusion, fission, and nuclear increases of 3.2 percent, 2.9 percent, 4.0 percent, and 2.9 percent by remaining silent on that without giving any numbers. That is just not a good match.

And the question is why are we proposing this, and my suggestion is that we will remove these set-aside authorizations and continue as we have in the past, working between this committee, the Appropriations Committee, and the Department of Energy to establish good authorizations each year and appropriations each year.

So that is the purpose of the amendment, Mr. Chairman.

Chairman BAIRD. Mr. Garamendi is recognized.

Mr. GARAMENDI. I guess because I am such a freshman that I am going to be talking more than perhaps I should. Dr. Ehlers, I agree entirely with you about the fusion and the nuclear energy issue, but I am not sure that I agree on the way in which you are trying to accomplish it here. I think it is—I am perfectly happy to tell people what I think we ought to be doing, how we ought to be spending money from this committee, and it does this, although it doesn't speak to the fusion piece of it, which I think we ought to.

In other words, I think we ought to tell them, here is how we believe things ought to be spent, and I would prefer that you would not strike this but add the fusion piece to it and work through that process.

Mr. EHLERS. Will the gentleman yield?

Mr. GARAMENDI. Certainly.

Mr. EHLERS. That may well be a possibility, but then I think we have to sit down and look at the whole area, and traditionally we have not done this. We have set authorizations for the Department and then every year worked with the appropriators and the Department to choose the specific numbers for that year.

I am very concerned about the fusion aspects. You, of course, are worried about the laser activity and things of that sort, but also we are collaborators with several other nations in developing the ITER Project in France, and that, again, is starting to reach fruition, and we are going to need substantial increase in that area.

Mr. GARAMENDI. I guess what I would—if you would yield?

Mr. EHLERS. Yeah.

Mr. GARAMENDI. What I would recommend here is that we enter into a really serious discussion about how to allocate these funds and see to it that the fusion piece of it is properly noted and allocated. Now, I am all for this committee suggesting in legislation how the appropriators ought to appropriate.

Mr. EHLERS. Well, there are many, many different issues if I may. I raised the one about the educational programs. I thought it was a horrible mistake some years ago when we basically cut out

the nuclear reactor programs at a number of universities, including the University of Michigan in Ann Arbor, which had one of the best educational programs. Now we need nuclear engineers. We don't have them.

And so I thought that was very short-sighted, and it is proving to be that. So I think, yeah, I am certainly amenable, Mr. Chairman, to having continued discussion on this before we move onto the Floor with it, but I would suggest we just adopt the amendment now and work together on coming up with the final version that we will present on the Floor.

Chairman BAIRD. Mr. Garamendi, do you yield back your time?

Mr. GARAMENDI. Well, I will just go back to say that I think what needs to be done here is to bring the nuclear issue into this and add that into it rather than subtracting what is already here. Obviously the numbers are going to change, and that is to be expected.

Either way as long as we get to the end where we use what power this committee has to say here is our priorities, and I certainly think we ought to add the nuclear fission, fusion into it. And I would love the education piece, too.

Mr. EHLERS. Yeah.

Chairman BAIRD. Ms. Biggert.

Ms. BIGGERT. Thank you, Mr. Chairman. I rise in strong support of this amendment. I do have a concern about the appearance of singling out the three specific programs, and I think that it really raises the question of winners and losers. Are we really, you know, deciding what funding—and since the funding goes through 2015, I think we lose flexibility since we are talking about basic research and programs that will change as the years go along, and to decide that—which ones will get a specific amount of money when one year they might need more, the next year they might need less, and I think this has to be decided, you know, in NIH, you know, we have the research there.

We don't decide how much is going to go to cancer research, how much is going to go to a specific, you know, diabetes, whatever. That really is left up to the experts, and I think we lose the flexibility for all of these programs.

And I think it is sending a, you know, it is sending a real message that there are favorite programs, and I also think that it could discourage researchers, young researchers deciding what kind of program they want to go into, and they see that there is a lack of commitment for a—to a broad-based national science program so that they might not go into that, and that is how we are going to have losers that aren't going to have the scientists going into that area.

So I think that this is a real problem to just, you know, to have just the funding for those. We need the flexibility, and with that I would yield back.

Mr. GORDON. Well, if the gentlelady would yield.

Ms. BIGGERT. Yes, I will.

Mr. GORDON. I think most of us would like to see increases, you know, across the board, and there will be increases across the board. I think we have to be somewhat practical here, and that is that the appropriators are going to be the ones that are going to

finally put the, you know, put the money in the holes, where it is going to go.

And so the question I guess is, you know, through the testimony that we have received from various witnesses is should we put a sort of a marker down as to we want to see general increases, but here are some areas that for our national, international competitiveness should be given priority.

So it is just whether or not we want to, you know, go around the back door and whisper in the appropriator's ear. I am not sure what that will do, or whether we should make some statement earlier. Again, this is not trying to penalize any other program. It is just, you know, whether or not we feel like we need to send a message to the appropriators.

I thank you, and I yield back.

Ms. BIGGERT. Well, my question is since we have already put down these markers for every year, we are saying that that is the way it is and let us say three years from now there is a new, you know, a new program that is really important and needs more funding and can that be changed?

Mr. GORDON. Well, first of all, again, if the gentlelady would yield. Certainly it can change, and again, this is just a message to the appropriators. We may want to send them a different message later on. It is just, you know, how relevant do we want to be in trying to set priorities?

Once again, this—otherwise what we are doing is just say increase, you know, that we are satisfied with the status quo, just, you know, if we are going to have a three percent increase or a four percent increase, just raise everything the same.

And so, I guess, you know, again, whether or not we want to use some type of a statement from this committee, from the witnesses that we have heard from, that there should be some priorities. I know certainly talking with, talking with NASA, for example, Mr. Mollohan wants us to try to set some priorities. He wants us to try to give them some direction. I think to not do so we acquiesce the hearings that we have had, the recommendations that have come before us to appropriators who have not had that benefit.

Ms. BIGGERT. Has that happened in the past, Mr. Chairman?

Mr. GORDON. Has what happened in the past?

Ms. BIGGERT. Have we ever had a marker down and the appropriators have not acquiesced to that? Have we had a marker?

Mr. GORDON. I can't imagine that they have followed our wishes perfectly over the years.

Ms. BIGGERT. I yield back.

Chairman BAIRD. I thank the gentlelady.

I recognize myself for five minutes. I am actually sympathetic to the argument of the Chairman and Mr. Garamendi. I think one of the roles of this committee and the reason we have hearings and the reason there is a Science Committee is that we have hearings, and we look at the expenditures and programs within the various agencies under our jurisdiction, and we quite appropriately make recommendations. That is what it means to be on this committee. That is what it means to have a Science Committee.

Of course, the appropriators sometimes ignore that, but I think it is important for us to put direction down. Now, a couple of points about that.

One, there is room in the bill as written for all, for growth in all of the areas, so if it is more specified in some than others, but there is room for growth in all of the areas, and we are talking about fairly generous growth relative to other aspects of the federal budget.

Secondly, in the areas in which—that are singled out here for perhaps somewhat greater authorization levels, are areas that in the Committee's judgment based on the hearings we have had are more likely to produce rewards for the investment, and that is why we have chosen to single those out.

And then, third, some of the areas that are being identified by the amendment as somehow—or by the discussion of the amendment at least somehow subject to neglect, already receive a fairly generous portion of the funding budget of the overall budget. So though I understand the sentiment of Dr. Ehlert, in this case I am reluctantly inclined to oppose the amendment and maintain the legislation as written.

Mr. EHLERS. Will the gentleman yield?

Chairman BAIRD. I would be happy to yield.

Mr. EHLERS. Just to comment on that, going back a little further in history, you recall some years ago the America COMPETES Act, we decided we wanted to increase the funding with authorization and appropriation of the Department of Energy and the National Science Foundation and so forth. Rather substantial increase. We talked about doubling and three years doubling it, five years, things of those sort, and that, I think, was a very important step forward because the research that we do in this Nation drives the economy in many ways.

What I am drawing attention to here with my amendment is the lack of appropriate authorizations in my mind for fusion and nuclear and some of the others. The increases that are in authorizations that are in the bill are actually less than the inflation rate that we have averaged over the last five years, which is about 3.3 percent.

So that seems to me inappropriate when we are giving over 10 percent increases annually for four years in a row to certain areas and holding others below the actual rate of inflation. So I, you know, it just seems to me that is shortsighted, and particularly in view of the needs that we are going to have in fusion in the next few years, the needs we are going to have in nuclear engineering, education, and so forth.

So my attempt is to try to—maybe I am taking a sledgehammer to it by saying we are just going to set these aside, and I am open to other ways of approaching them, but I just think it is not wise to keep the levels in law that we have included in the bill at this point.

Chairman BAIRD. I reclaim my time and recognize Mr. Garamendi.

Mr. GARAMENDI. Mr. Chairman, if I might, I find myself both in agreement and disagreement with Mr. Ehlert here. His point, I think, is one that is well taken that the overall authorizations, that

is the \$6 billion, \$7 billion, and so forth, are below the rate of inflation, and since we are authorizing, we ought to authorize to the maximum extent that we can afford embarrassment, so just short of that point. That gives the authorization. Whether the money is going to be appropriated or not is another matter.

And that—the three items in each of these three-year authorizations are really minuscule compared to the total. The first one is \$3.1 million of the \$6.2 billion. It is—and similarly small amounts in each of the years thereafter, but it does give direction to the Department, and I am all for, you know, I spent time as the Deputy Secretary at the Department of Interior, and I was quite happy to have total authority to spend the money anyway we wanted to spend it, but now I am here, and I want them to spend it the way I want them to spend it.

So these are really small, and I would like to work with Dr. Ehlers on this and increase the total authorizations and if necessary, add the nuclear issues to it, including the education issues. You know, when I am on that side, give me all the power, and I will spend the money wisely. When I am on this side, let us spend it the way we think it ought to be spent, and I am delighted to work with it.

I would suggest that the amendment not go forward, that we work on adding to this section the issues that Dr. Ehlers is concerned about.

Chairman BAIRD. Mr. Garamendi, before I recognize colleagues on this side, I will just clarify. Some years ago, a couple—I am one of the few Members that actually read the “dark version” of the Intel Bill, and a few years ago as I read through it there was language that I think said that—that is a very good point. She said “don’t tell, they will shoot me”, but the gist of it was the preface language to the budgetary amounts said all—if I remember correctly—all numbers are in millions. And, in fact, it was actually thousands. Had they been in millions we would have been spending multiple trillions of dollars on—I can’t tell you what or they would shoot me, but we seem to have done that a little bit here.

And the manager’s amendment corrects it, but there are typos in the text of the language. I am going to ask counsel to clarify that, so this is substantive, and I want to make—because we have got, I think, three orders. We have got a three orders of magnitude errors here, which is substantive.

Counsel, could you clarify that just so Members looking at the text—

COUNSEL. This is corrected in the manager’s amendment.

Chairman BAIRD. But give us some examples just—

COUNSEL. Okay.

Chairman BAIRD. Mr. Garamendi cited a number which I think is actually about 1,000 higher, and it is not your mistake. It is the text of the bill.

COUNSEL. The breakouts for the individual sub programs and the authorization levels need to all be multiplied by 1,000. They need three more zeros.

Chairman BAIRD. Not your fault, Mr. Garamendi. No. You were reading well, and then that is why the hard part—as some of you

know, I have championed this idea that we have time to read it, and that is why we have time to read these things so we find them.

The manager's amendment corrects some of that, but it is certainly misleading when one looks and says, "oh, this is not very much", and it turns out it is a lot.

So apologies on behalf of the staff. I think Mr. Neugebauer wanted to be recognized.

Mr. NEUGEBAUER. Yeah, and I will just be brief. I think what I heard Mr. Ehlers say, and I want to be—clarify this, you know, there are some feeling here we need to bump up the authorization levels. I heard Mr. Ehlers saying that being specific about, you know, may limit the flexibility, but, you know, I think the overall question here is we are running these kinds of deficits that are truly unsustainable where we are talking about doubling the national debt in 5 years and tripling it in 10 years.

Should this committee be sending a signal that we need to be bumping up spending? Should the signal be more—should we be sending a signal of prioritization, and whether we want to take on that prioritization or not is another discussion, but the real question here is is I think, you know, should we be moving forward with an authorization that is increasing when, you know, we are borrowing every dollar we spend under this authorization. As soon as it is appropriated, we are going to borrow 40 cents of that money.

So I just ask that as—if Mr. Ehlers' amendment helps us accomplish a push of the agency to—or for us to stop and pause and think, well, maybe as a committee we need to do some—help that prioritization, I am willing to do that, but I am a little reluctant to, you know, move down the road and saying we got to spend more money.

Chairman BAIRD. Will the gentleman yield back? Just very briefly to respond and then I will recognize my colleague, Mr. Inglis, or actually if someone on this side wants to comment. I am very sensitive to that argument and respect it very much.

I think one of the issues is if one looks at where, for example, our balance of trade deficit goes, a very substantial portion of that is energy dependence, and if one looks at a host of other things that are costing our economic competitiveness, it is contributed to by the cost of energy.

My hunch is that every committee in this Congress believes that their jurisdiction is meritorious of an increase while the others aren't, and they quite rightly can make arguments about that, but this is our committee. I will make the argument for it here.

I agree with the gentleman. We need to find ways to reduce expenditures I believe, including entitlements and on the discretionary side. At the same time, however, I also believe that our competitiveness as a country economically and our ultimate financial stability is going to depend on breakthroughs in this very realm. That is why I am so enthusiastic about the Chairman's initiative with COMPETES in general and ARPA-E.

And so sensitive to this broader issue of fiscal implications, I do think we also have a responsibility to say from this committee's perspective, at least my personal perspective, investments in energy are—have the potential to return a strong investment.

The gentleman's point is well taken.

Further discussion on this side? Mr. Inglis wanted to be recognized.

Mr. INGLIS. Mr. Chairman, I think it is—what you just said is well said. We are borrowing an awful lot of money. When you have a debtor in possession, it is quite possible that bankruptcy court will allow the debtor to borrow some money if they got a good plan, a good idea that might get them out of bankruptcy, and that is really where we find ourselves as a country, I believe.

And so you got to be asking, is it worth borrowing the money for this? And I agree with what the Chairman just said, that in many cases we have the opportunity here to power ourselves out of the current situation by breakthroughs. And so that all makes sense, and I think most people on our committee agree with that.

We are sort of back to the beginning here, though, on this debate on Dr. Ehlers' amendment here, because this is the very first debate we were having on the first Ehlers' amendment, which is is this committee going to try to direct the Office of Science to do applied research? Or is it going to preserve the Office of Science pure science role? I think this is—I don't know if Dr. Ehlers wants to comment on that, but I think the amendment he is talking about here is just the same as our first amendment, which is—or the first amendment that you offered, is the question if these sort of directions in A, B, and C in the language here are really designed to direct the Office of Science, it seems to me, to do applied work rather than to do the basic work.

And so it goes back to that first question.

Chairman BAIRD. And that is a recess call and not a vote.

Mr. INGLIS. And it is also—I think it is important to note that while it is possible for us to revisit this authorization and change these numbers if there is a breakthrough as Dr. Ehlers well points out with some new technology, the problem would be that it is a fairly complicated reprogramming process for the Department of Energy to go through with the appropriators to move that one around, which takes time, and we might not have time. We are in a race with the Chinese, for example, on these technologies, and if we plan on winning that race, we need some flexibility at the Department.

And it is an odd place that we on this side of the aisle find ourselves in. We are here arguing for flexibility on behalf of a Democratic Administration to move quickly to change things at the Department of Energy. So we find ourselves in a rather awkward position here, arguing for flexibility for Secretary Chu to do what we needs to do with new developments.

So we are trying to help him out. It is sort of an odd position, so I yield back.

Chairman BAIRD. Very interesting observation with respect to the Administration and Secretary Chu. I still think we want to exercise some jurisdiction here.

Is there further discussion, or shall we call the vote on this?

Hearing no further discussion, the vote occurs on the amendment. All those in favor, say aye. Those opposed, no. It appears the no's have it. The no's have it. The amendment is not agreed to.

Mr. EHLERS. Could I ask for a recorded vote?

Chairman BAIRD. The gentleman asks for a recorded vote. The clerk will call the roll.

The CLERK. Chairman Baird.

Chairman BAIRD. No.

The CLERK. Chairman Baird votes no. Mr. Costello.

[No response.]

The CLERK. Ms. Woolsey.

Ms. WOOLSEY. No.

The CLERK. Ms. Woolsey votes no. Mr. Luján.

Mr. LUJÁN. No.

The CLERK. Mr. Luján votes no. Mr. Tonko.

[No response.]

The CLERK. Ms. Johnson. Ms. Johnson.

Ms. JOHNSON. No.

The CLERK. Ms. Johnson votes no. Mr. Lipinski.

Mr. LIPINSKI. No.

The CLERK. Mr. Lipinski votes no. Ms. Giffords.

Ms. GIFFORDS. No.

The CLERK. Ms. Giffords votes no. Mr. Matheson.

Mr. MATHESON. No.

The CLERK. Mr. Matheson votes no. Mr. Davis.

Mr. DAVIS. No.

The CLERK. Mr. Davis votes no. Mr. Chandler.

Mr. CHANDLER. No.

The CLERK. Mr. Chandler votes no. Mr. Garamendi.

Mr. GARAMENDI. No.

The CLERK. Mr. Garamendi votes no. Mr. Gordon.

Mr. GORDON. No.

The CLERK. Mr. Gordon votes no. Mr. Inglis.

Mr. INGLIS. Aye.

The CLERK. Mr. Inglis votes aye. Mr. Bartlett.

Mr. BARTLETT. Aye.

The CLERK. Mr. Bartlett votes aye. Mr. Ehlers.

Mr. EHLERS. Aye.

The CLERK. Mr. Ehlers votes aye. Mrs. Biggert.

Ms. BIGGERT. Aye.

The CLERK. Mrs. Biggert votes aye. Mr. Akin.

[No response.]

The CLERK. Mr. Neugebauer.

Mr. NEUGEBAUER. Aye.

The CLERK. Mr. Neugebauer votes aye. Mr. Diaz-Balart.

Mr. DIAZ-BALART. Aye.

The CLERK. Mr. Diaz-Balart votes aye. Mr. Hall.

[No response.]

Chairman BAIRD. Would the clerk—has everyone voted, or are there additional Members?

Mr. Tonko.

The CLERK. Mr. Tonko is not recorded.

Mr. TONKO. No.

The CLERK. Mr. Tonko votes no.

Chairman BAIRD. Are all other Members recorded that wish to be recorded on both sides?

The clerk will report the tally.

The CLERK. Mr. Chairman, six Members vote aye, and 12 Members vote no.

**SUBCOMMITTEE ON ENERGY AND ENVIRONMENT
COMMITTEE ON SCIENCE AND TECHNOLOGY**

Date- March 25, 2010

Roll Call No. 7

Sponsor of Amendment
Mr. Ehlers of Michigan

Committee Print

Passed Voice Vote Defeated ✓ Withdrawn

MEMBER	AYE	NO	PRESENT	NOT VOTING
Mr. BAIRD, Chairman		✓		
Mr. COSTELLO				
Ms. WOOLSEY		✓		
Mr. LUJÁN		✓		
Mr. TONKO, Vice Chair		✓		
Ms. JOHNSON		✓		
Mr. LIPINSKI		✓		
Ms. GIFFORDS		✓		
Mr. MATHESON		✓		
Mr. DAVIS		✓		
Mr. CHANDLER		✓		
Mr. GARAMENDI		✓		
Mr. GORDON, Ex-officio		✓		
Mr. INGLIS, Ranking Member	✓			
Mr. BARTLETT	✓			
Mr. EHLERS	✓			
Ms. BIGGERT	✓			
Mr. AKIN				
Mr. NEUGEBAUER	✓			
Mr. DIAZ-BALART	✓			
Mr. HALL, Ex-officio				
TOTALS	6	12		

Chairman BAIRD. It appears the no's prevail, and the amendment is not agreed to.

Thank the gentlelady.

With that the eighth amendment on the roster is an amendment offered by the gentlelady from Illinois, Ms. Biggert. Ms. Biggert, are you ready to proceed with your amendment?

Ms. BIGGERT. Yes, I am, Mr. Chairman. I have an amendment at the desk.

Chairman BAIRD. The clerk will report the amendment.

The CLERK. Amendment number 096, amendment to the Committee Print offered by Mrs. Biggert of Illinois.

Chairman BAIRD. I ask unanimous consent to dispense with the reading.

Without objection, so ordered.

And I recognize the gentlelady for five minutes to explain her amendment.

Ms. BIGGERT. Thank you, Mr. Chairman. My amendment is very straightforward. It proposes to reduce the funding level for the Office of Science by roughly two to three percent from the proposed levels in the underlying text with proportional changes to the set-asides for each prescribed sub program.

And, you know, I have long supported and will continue to support opportunities to enhance the mission of the Office of Science and the funding to support that mission. In fact, every year I lead a letter to appropriators that request increased funding levels for the Office of Science, consistent with COMPETES. This year we had over 40 signatures for the fiscal year 2011, request for the Office of Science at \$5.12 billion and which also is the Administration's request for the year 2011.

And I would like to ask unanimous consent to enter a copy of that letter into the record.

Chairman BAIRD. Without objection.

Ms. BIGGERT. Thank you.

Ms. BIGGERT. However, Mr. Chairman, consider the country's economic state and the recent infusion from the America Recovery and Reinvestment Act to the Office of Science, I thought we could find more reasonable authorizing levels for the Office of Science as we work to craft a new COMPETES bill. And, again, this would be at the Administration's level.

I believe that we can support and work with the Office of Science with the proposed changes in my amendment, and thank you for calling this subcommittee markup this morning, and I am very pleased to be a sponsor of this bill. I just think that we are spending too much across the board, and this would be—help to reduce this—the spending and move forward with our economy.

So—and I thank you for having the opportunity to work with you to reauthorize the Office of Science, and I would yield back.

Chairman BAIRD. I thank the gentlelady for her amendment, and I thank the gentlelady for her input. This is one of those cases where I suppose if all across the board all other committees would agree to the relevance of a cut for them, the context would be different, but I still maintain the point I made with Mr. Neugebauer earlier. The *Rising Above the Gathering Storm* report, as you know, called for a doubling over time, and the premise was that we are falling behind some of our economic and potentially strategic competitors as well, and if we continue to fall behind, we will never catch up. And that is not a position we want, and the driver of our economy over the last few decades has largely been technological innovation, and this is an area where we urgently need it.

So though I am sympathetic and I would not be surprised if the actual appropriations don't match the authorized levels, giving that amount of imprimatur that we believe there is merit to increasing spending in this area as an investment by the American people is, I think, appropriate in this case.

I will be happy—

Ms. BIGGERT. Will the gentleman—

Chairman BAIRD. Yes. I will be happy to yield to Ms. Biggert, then I will recognize the Chairman.

Ms. BIGGERT. Thank you.

Chairman BAIRD. Mr. Chairman, I will yield to Ms. Biggert and then I will recognize you for five minutes.

Mr. GORDON. Okay. Perfect time.

Ms. BIGGERT. I think the—because of the Stimulus, which was \$16 billion coming in, which was, I think, you know, a God-send to the Department of Energy and to the Office of Science and really shows a commitment to answering the, you know, the rising tide, and I really, you know, believe that we—and have always supported doubling the Office of Science, and I think we worked on that starting in 2005. We always have a few setbacks, but I do think that to drop it by—would end up to be, I think, a \$1 billion cut, would really show that we can do this and yet not break the bank.

Chairman BAIRD. I thank the gentlelady.

The Chairman is recognized for five minutes.

Mr. GORDON. I thank you, Mr. Chairman.

Let me make a couple of points. First of all, *Rising Above the Gathering Storm* did recommend that we double the funding in this area. They didn't really say over what period of time. Many of us wanted it to be over a seven year period, others wanted it longer. We wound up doing it at a 10-year period just to try to be more frugal during this period.

That is one point. Another point that I would make is that, again, this is an authorization rather than an appropriation, and I think it does make sense to have a little more flexibility in the authorization level in case there was some kind of an emergency that came up or some kind of breakthrough since we are talking about, you know, a few years here.

With that said, I think that as we get to the final, to the Full Committee markup, there may be some reductions down. Again, I don't want to leave anything on the table in the future if we need to have some increases, but also there is no need making it unnecessarily combative or unnecessarily controversial by having unrealistically-high numbers.

But would I would suggest is that we adjust it across the board and that we wait until the Full Committee so that we can look at it in context to all of the various agencies.

And I yield back my time. Thank you.

Ms. BIGGERT. Will the gentleman yield?

Mr. GORDON. I will regain my time, and yes, I will—

Ms. BIGGERT. Would you—would the gentleman be willing to work with me—

Mr. GORDON. Absolutely. Absolutely. I think we need to look at this, I mean, and you are someone who wants to look at it, you know, in a positive, constructive way. Again, let us try to not leave anything on the table, as I say, in case there is an emergency in the future, but at the same time let us not give unnecessary heartburn by making authorizations that are—we all know would be unreasonable to ever meet.

I would be happy to continue to work with you, and again, in the full context of the America COMPETES Bill as we go to the final—to the full committee markup.

Ms. BIGGERT. Then I would be willing to withdraw my amendment.

Chairman BAIRD. I thank the gentlelady, and I concur with the Chairman.

Dr. Bartlett, you wanted to be recognized though the amendment is withdrawn, but I will still out of courtesy and respect allow you to speak.

Mr. BARTLETT. Thank you very much. As everyone knows I have been a very strong supporter of basic and applied research and the Office of Science, and I wanted to make a couple comments relative to the ARPA-E.

I hope that we will be able to use far more money than that to authorize the bill for ARPA-E, but I am not certain, and my concern is I don't know how rapidly they can responsibly grow this program. Ramping up to \$1 billion over-by the way, I hope that it can be more than that because as you know, I believe that our country faces some huge—the world and our country faces some huge challenges in energy, and I would like to see even more than this amount of money profitably, effectively used, but I am not sure they can do that.

What kind of oversight can we have so that we can redirect this funding in future years, if, in fact, they are not able to responsibly let grants and contracts in these amounts? I just don't want that money to be there and they have the rush at the end of the year to spend it all, and it won't be spent productively.

Will we have adequate oversight opportunities so that we can modify the—I would like to up them, by the way. I would like them to have a lot of unfunded projects that were very meritorious so the next year we can have more money for this. Do we have opportunities to do that?

If so, I am okay with these funding levels. If not, I am somewhat squeamish about them because I don't want them to have huge amounts of money that they cannot responsibly use.

Chairman BAIRD. Mr. Bartlett, if you will yield.

Mr. BARTLETT. I will be happy to.

Chairman BAIRD. I may—if counsel can remember the numbers off the top of his head I will ask them or perhaps the Chairman does, my understanding of the ARPA-E fund, and of course, that is not the topic right here of Ms. Biggert's amendment, but I believe they had 3,700 applications for the initial round of ARPA-E grants, knock that down to what was it, 140 and then further knock that—does counsel remember these numbers off the top of their head?

COUNSEL. It was 3,700 applications. It was then knocked down in the next round to roughly 300, and then the final awards were 37.

Chairman BAIRD. Okay. So they—so very—there were a lot more applicants and when I—they were very rigorous, and to their credit they turned it around faster with, I think, tremendously distinguished people on the review panel to get these things moving.

So the gentleman's point, unlike sometimes we hear federal agencies going out and almost creating projects to spend the money, here it was the reverse. They had enough applicants that they were actually rejecting very worthwhile applications, and then they moved them to later rounds.

But I share the gentleman's concern. I think in the case of ARPA-E we actually see an abundance of opportunities that are actually—we would like to meet but we don't have resources for.

Mr. GORDON. Would the gentleman yield?

Chairman BAIRD. I would be happy to.

Mr. GORDON. Again, this is an authorization rather than an appropriation, and so what we are doing is giving flexibility, and I am right in sync with your comments.

Let me give you some maybe feeling of comfort in that this committee I would hope every year is going to call ARPA-E before it to have it be accountable and to monitor it. So, yes, we will be watching them every year and making sure that they are spending it properly.

And then this, again, this is an authorization that if, you know, you in the future think that they are doing terrific and need more, then you have room for them. If you think, well, and we will tell that to the appropriator, if with reviewing what they are doing you think that it is not being done responsibly, then you can go to the appropriators and say, we have had this review, and we think that they need to be held a little more in check.

So I think what we are trying to do here is accomplish exactly what you want, and that yearly monitoring will help to do that.

Mr. BARTLETT. I appreciate that. Thank you very much.

Ms. BIGGERT. Will the gentleman yield?

Mr. BARTLETT. I will be happy to yield.

Ms. BIGGERT. I just want to correct the record for something I said as far as the Stimulus that the Office of Science received. Not \$16 billion but \$1.6 billion. It would have been nice if they had received the \$16 billion, but I want to make sure that that is corrected.

Chairman BAIRD. I thank the gentlelady. These orders of magnitude problems we are having today.

I thank the gentlelady and thank the gentleman for his comments.

The amendment having been withdrawn but with the proviso that we are happy to discuss the issue further between now and the final markup we now proceed to the ninth amendment. The ninth amendment on the roster is an amendment offered by the gentleman from Florida, Mr. Diaz-Balart. Are you ready to proceed with your amendment?

Mr. DIAZ-BALART. Yes, thank you very much, Mr. Chairman. I hope that this amendment is one of the categories of trying to avoid unnecessary—

Chairman BAIRD. Would the gentleman suspend for one moment? The clerk has a report.

The CLERK. Amendment number 019, amendment to the committee print, offered by Mr. Mario Diaz-Balart of Florida.

Chairman BAIRD. Now, the gentleman may proceed.

Mr. DIAZ-BALART. Thank you, Mr. Chairman. I hope this is a—

Chairman BAIRD. I ask unanimous consent to dispense with the reading. Without objection, so ordered. Now, the gentleman can proceed.

Mr. DIAZ-BALART. Thank you, Mr. Chairman. I hope this is one of the amendments to avoid unnecessary heartburn category. I really do.

Look, I just—let me first put a couple things in perspective. In 2011, the budget that was submitted by the President is \$3.8 trillion. The revenues, unfortunately, are \$2.6 trillion. Now, that is followed by a budget of \$3.6 trillion, with revenues of \$2.4 trillion.

The committee print before us authorizes over \$40 billion over five years. So, let us go over some of the spending details. In the first year, funding of the bill, it recommends funding the Office of Science at 21 percent, or \$1.1 billion above the Administration's own request.

Now, you know, one can criticize the President for a lot of things, but nobody has criticized the President for not spending enough money. And I am not, I mean, I think so. I mean, I think, that would be an unfair statement to criticize him for that. So, this is above the President's recommendation. ARPA-E, which was funded in the stimulus Act, as Mrs. Biggert mentioned, and I mean, which is really a new program, the bill more than triples its funding over five years, triples it, and it extends it through 2020 with, "such sums as necessary."

The third part, the Energy Innovation Hubs, another new program, is being, that is being pursued by the Administration, and which appears, frankly, to be similar to the same technology efforts that we are already funding at DOE, is created, and would double in funding, double in funding over five years.

Again, all this amounts to over \$40 billion. Perspective. The State of Florida, one of the most populous states in the entire country, their entire budget last year was \$66 billion. Just to put it in perspective.

Now, perhaps most remarkable is that this bill is only one of three bills that will be merged together in an overall authorization package. So, this represents just the tip of the iceberg, when it comes to new spending authorization in the America Competes Act.

Now, again, I am not criticizing the merits, at all, but we can't think of this in a vacuum. This amendment would do the following. It would simply strike the out year funding. It doesn't reduce the funding authorization in the first three years. It would just strike the out year funding to make it a three year authorization, which by the way, is consistent with the original America COMPETES bill.

This is not—I am not inventing this. This is not a hostile amendment at all. Again, and I am not talking about the merits. What does that mean? That we would have to revisit the issue and then decide what the level should be. And again, we might decide that it should be even more if, you know, the economy is doing great, and the deficits are lower and, you know, we might want to authorize a lot more. It would just force us to look at the issue in three years. That is all this would do.

This would allow our committee to conduct even more effective oversight over the entire Competes program, and then, come back

in three years and review it. So, all I am asking is to give us, to make us review it in three years, and figure out where we are.

Most importantly, this amendment would obviously, then, reduce the authorized spending in this bill by \$18 billion, and then, we would have to re-look at it.

Now, this Congress, and this Administration, frankly, we need to kind of just try to bring a little bit of sanity, let us at least force ourselves to look at it in three years, and then we will, we can decide to do what we want to do.

Again, perspective. According to the CBO, the President's budget raises the deficit to a record \$1.5 trillion in 2010, and debt held by the public grows to \$9.2 trillion this year, with no end in sight. And this bill goes above, above the President's recommended levels.

Again, all I am asking, just, as the chairman said, because it doesn't, you know, nobody can say it cuts the program, it just forces us to look at it in three years. That is it. That is all this does.

So, I am asking for a favorable vote, and I hope that it is taken, again, in, with the intent that it is. Just, let us just kind of, to avoid the heartburn, the chairman said, let us try to just look at it again in three years. Let us, give us that opportunity, and that is all the amendment does, Mr. Chairman. Thank you.

Chairman BAIRD. Thank the gentleman. I, having served with the gentleman on the Budget Committee, we don't want to necessarily replicate all those discussions. I would just point out, for the record, that when President Clinton left office, the budget deficit was actually a surplus of \$200 billion. At the final years of the President Bush Administration, the last budget for which he was accountable, the deficit stood at \$1.3 trillion. During that interim, much of which was controlled by the Republican House and Senate, the federal debt doubled. The borrowing from foreign countries doubled. And our dependence on Chinese money more than doubled.

And I would also say that if you look at the Clinton years, much of the economic expansion resulted from technological developments that increased productivity, and part of what we are trying to do here is promote technological innovation.

Chairman Gordon wanted to be recognized. In a moment, I will recognize Mr. Gordon.

Mr. GORDON. Well, you know, I don't know that this is the place that we need to recap all of our past sins. There is plenty of blame to go around in terms of the debt. We are where we are now. I certainly agree that innovation will help us get out.

And my friend from Florida, we are, again, I am sympathetic with much of what he says. Let me just sort of point out a couple of things. Reducing a five year authorization to a three year authorization doesn't save you any money in those first three years. So, you know, it is a little bit of apples and oranges.

We don't have to wait to the end of either three or five to reauthorize. And as I said to Dr. Bartlett earlier, I hope that this committee, every year, is going to be reviewing these programs, and I hope, if they deserve it, you will give them more. If they don't deserve it, you will reduce them. And so, I think that will be a part of, you know, your responsibility.

And I would also say the same thing that I said to Mrs. Biggert, and as you caught on, and I think very well, also. Again, we don't want to be inflammatory here. I mean, there is, you know, I don't want to leave anything on the table, but I don't want to make your heartburn any more than necessary.

So, why don't we look at this in the full context, you know. We probably still won't get to where you are, but hopefully, we will make you feel a little bit better. But let us look at it in the full context of this full America COMPETES bill, would be my recommendation.

Chairman BAIRD. Dr. Bartlett wanted to be recognized.

Mr. BARTLETT. I want to concur with the gentleman's concern about our spending. There are few Members of the Congress who more consistently vote against spending than I do. The walls of my office are filled with awards as a testament to how consistently I vote against spending, but I would like to exempt two things from that, from those concerns.

One is basic research. We spend less and less each year on basic research. That is exactly the equivalent of the farmer eating his seed corn. I have a lot of farmers. They aren't dumb enough to do that. We are doing that in our country and in our Congress today. So, I would like to really increase funding there.

The second place I would like to exempt is anything that has to do with energy. Every 12 days, the world uses a billion barrels of oil. Now, that stuns many people to know that. It is 84 million barrels a day. A little more than that now, actually, and that 84 goes into 1,000 about 12 times, so that means that every 12 days, we use a billion barrels of oil.

We have 1.2 trillion barrels of oil, easy arithmetic, about at the sixth grade level, we have 40 years of oil left. Now, we are going to find more oil, but we would sure as heck like to use more oil. So would the Chinese and the Indians and a lot of developing nations.

And if we are going to be more than lucky, if the more oil we find is more than the additional oil we would like to use. So, we are stuck with 40 years of oil. Almost nobody understands the urgency of this situation.

So, you know, I really want to be, to cut drastically. We need to. Now, I have 10 kids, 17 grandkids, and two great grandkids, and I fully mortgaged the future of my kids and my grandkids, and now, we are working on my two great grandkids. So, you know, but I just think we need more money for basic research, and we need a hugely increased amount of money effectively spent on energy.

So, although I concur with his overall concerns about spending, I would like to exempt these two areas, if I might. Thank you.

Chairman BAIRD. Thank you, Dr. Bartlett. Ms. Giffords.

Ms. GIFFORDS. Mr. Chairman, I just wanted to add in there, as a proud co-sponsor of the Energy Innovation Hubs, that we are not creating new government labs that are going to be forever dependent. In fact, we are looking at a proven model. This is tried and true. Some of the examples include Bell Laboratories, Lincoln Lab as well.

I appreciate the comments made by Mr. Bartlett about our dependence on foreign energy, and it is precisely those concerns that are leading us to really innovate around these programs.

Again, this is a maximum five year program. At that point, they need to be looked at and reexamined again, but it is really an opportunity for us to be innovative. So, I mean, I certainly understand and hear the concerns that are being spoken about, but I think the promise of what we are going to see out of the best and brightest in these Energy Innovation Hubs is pretty exciting stuff. And it is something that this committee has always been for, and we have advocated for. And frankly, the purpose of this committee is to get out in front of where those pockets of promise exist in our Federal Government.

Thank you.

Chairman BAIRD. Mr., anyone wish to be recognized on the minority side? Mr. Garamendi.

Mr. GARAMENDI. I really want to echo and expand on the comments of Dr. Bartlett. And I am going to back to a little history. Back in the '70s, we decided to become energy independent, and we did it for about three or four years, and then we let it go, and we went back to oil. And here we are, once again, in a similar situation.

We have to have a very long-term view of this, and we cannot start and stop. We have five years. Better, this should be a 25 year program, and this is on the research, but we also need the implementation of that research. Because Dr. Bartlett is quite correct. We got a real serious global problem here, and that will manifest itself not only in climate change, if you believe in that. But it is certainly going to manifest itself in troubles between nations, who are vying for the available energy supplies. And we have already seen that. A lot of what is going on in the world today is directly on that.

It is, this is our opportunity on the research side, the scientific side, to really get ahead of the game, and we need a very, very long-term view of this. Three years, two years, that is a short time. And the problem here is the research is long-lasting. It takes a long time to get that research out there. So, we start today on some research, and then, it may be three, four, five, or 20 years before that research manifests itself in a solution to an extraordinary, serious problem for this globe.

So, we need to have that long-term view, and with regard to the money, it is not a matter of throwing money at it, it is a matter of making the money available with the authorization, making the overall potential available, and then, the appropriators every year will do their thing. And hopefully, their thing will be a lot of money into this, but if we don't authorize it, they cannot appropriate it.

And so, we need to really be, I think, very thoughtful, longitudinal, that is, a long view, and we ought to have the potential there, and every year, the appropriators coming in, and hopefully, maximizing the potential, maximizing the money for this potential.

The other thing is the role of this committee and oversight. It is extraordinarily important that the oversight take place.

Thank you.

Chairman BAIRD. Thank the gentleman. I think the general concern about fiscal responsibility and this spending has been heard well. I think it is shared by both sides of the aisle.

Mr. Gordon has talked about working with Ms. Biggert to lower, possibly, the authorization levels. I would share my commitment to that. The one thing I would say about shortening the duration is, having talked with a lot of federal agencies, especially if you take a program like the Hubs or others, the ideas, as Ms. Giffords pointed out, if you are trying to make an investment, people need, they need some reliability of funding.

You know, like businesses are always coming to us and saying if you are going to change the tax code one way or another, we can't make the investments. Perhaps a lower authorization level in some of these areas, but shortening that, people will say well, I am not sure we are going to have the funding two years from now. They can't, you know, if you want to bring a top flight scientist on, and say, we want you to work on this major project for us, but we are not really sure we will have funding next year, the scientist is going to pass. If you say five years, and that is sort of how Bell Labs, it is how DARPA works, et cetera, and so, that is the rationale.

And so, I appreciate the gentleman's underlying concern. I know he has expressed it well and often, about the level of federal spending. I share that concern, but perhaps, a better way to deal with it is through an approach that tries to meet halfway with Ms. Biggert's approach there, rather than the shortening of the term.

So, if there is not further discussion, we will call the amendment. All those in favor will say aye. Those opposed, no. No. The no's have it. The amendment is not agreed to.

We now proceed to the tenth amendment on the roster, an amendment offered by the gentleman from Maryland, Dr. Bartlett. Dr. Bartlett, the clerk will report the amendment.

The CLERK. Amendment number 019, amendment to the committee print, offered by Mr. Bartlett of Maryland.

Chairman BAIRD. I ask unanimous consent to dispense with the reading. Without objection, so ordered. I recognize the gentleman for five minutes to explain the amendment.

Mr. BARTLETT. Thank you, Mr. Chairman. I have decided to withdraw the amendment that I was to offer this morning.

A few weeks ago, my staff met with the chief scientist and executive of a small company that is developing innovative energy technology. They learned of the opportunity to respond too late, so they couldn't respond. They shared with us a disappointing observation concerning the management of ARPA-E.

As we know, DOE was under tremendous political pressure from the White House to spend the stimulus money appropriated for ARPA-E as fast as possible, though Congress didn't confirm ARPA-E's Director until the first tranche of awards was announced.

These scientists observed what GAO has repeatedly found, and this is the GAO report, not us saying this. Among federal departments and agencies, DOE has, in their words, "a notoriously poor record for managing its funds and staff resources to achieve its chartered goals."

The purpose of my amendment was to set aside 30 percent of the funding for small business in ARPA-E, was to help ARPA-E, as it stands up, to achieve Congress' intent of supporting breakthroughs in technology.

A bit more than half of all of the employees in America work for small businesses, and considerably more than half of all the creativity and innovation comes from small business. So, I thought that 30 percent was a modest set-aside for small business.

I would appreciate a commitment from the chairman to explore in more detail, before the full committee markup, how to help ARPA-E direct a comparable percentage of its awards to small business.

Chairman BAIRD. I appreciate the gentleman's intent. A strong advocate of small business. I share that intent, and I share the gentleman's observation that often, the most innovative things come from small business.

My understanding is, ARPA-E statistics suggest 43 percent of the first round of awards actually did go to small business. So, we are—

Mr. BARTLETT. If the gentleman would yield.

Chairman BAIRD. Would be happy to.

Mr. BARTLETT. That is true, and I just want that to continue. That is not their history. Their history is, and you know, I worked for government, and I worked for captive government contractors, and I worked for big industry. I was IBM Federal System Division for a long, for eight years. So, I have been on both sides of that equation, and I know how easy it is to continue giving money to the guy you know.

Joe submitted a really good proposal, but gee, I know Sam, and Sam performs pretty well for me, and I am going to be graded on how well my contractors perform. I am going to give this to Sam, even though Joe's proposal looks better than Sam's.

I know that history, and I know that this is what the Department of Energy has been doing. And I just want to make sure that they continue this good performance. They are now at 43, I would like them not to slip below 30. So, let us talk about it before it—

Chairman BAIRD. If the gentleman would yield, the reason that ARPA-E is set up the way it is, it is different. We all recognize those type of problems within the Department of Energy. This is not an old program. This is a year-old program that is trying to break the mold. And we are trying to give them the tools to be nimble and be flexible, and to break those molds. I think they are doing a good job, and I hope that there will be a role model, not only for the rest of the Department of Energy, but you know, for Federal Government in general. And—

Mr. BARTLETT. I just want to make sure this good performance continues.

Chairman BAIRD. I agree with, I share that. I would just say I hope we can also do, encourage ARPA-E to do another summit next year, wherein the various vendors display their wares. I don't know if you got to go it, Dr. Bartlett. Knowing your passion for this, you would have been like a kid in a candy store there. The diversity of approaches that were being modeled, many of them from small startup business, a few from the large players, but was

really, truly inspiring. I absolutely share your commitment. I appreciate the withdrawal of the amendment, and as the chairman mentioned earlier, we intend to follow through in our oversight responsibility every year, and this a question we should ask ARPA-E when they come back. Is keep us updated on the statistics of small business.

With the amendment is withdrawn. Please.

Mr. LUJÁN. Mr. Chairman, if the gentleman would yield.

Chairman BAIRD. Well, I will recognize Mr. Luján. I will recognize Mr. Luján.

Mr. LUJÁN. Just as we proceed in making sure that we are able to retain the support for small business. I think this is an excellent point to bring forward, that we do not lose sight with some of the awards, with the attention to women-held businesses, veteran owned businesses, and minority businesses as well, and that we take that into consideration as we talk about this, as well. Thank you, Mr. Chairman.

Chairman BAIRD. Appropriately enough, the next amendment is the eleventh amendment on the roster. An amendment offered by the gentleman from New Mexico, Mr. Luján.

Mr. Luján, are you ready to proceed with your amendment?

Mr. LUJÁN. Mr. Chairman, I have an amendment at the desk.

Chairman BAIRD. The clerk will report the amendment.

The CLERK. Amendment number 042, amendment to the committee print, offered by Mr. Luján of New Mexico.

Chairman BAIRD. I ask unanimous consent to dispense with the reading. Without objection, so ordered. I recognize the gentleman from New Mexico for five minutes to explain his amendment.

Mr. LUJÁN. Thank you, Mr. Chairman, and appreciate this time, and appreciate the discussion today with Ranking Member Inglis, Chairman Gordon, for his work on ARPA-E.

Our country is changing the way that we use and consume energy, and Congress and our President have committed to investing in the new development of energy technologies that will reduce our dependency on foreign oil, improve energy efficiency, and create a robust energy workforce.

ARPA-E brings together a diverse community of energy researchers from the National Laboratories, universities, investor and commercial communities to develop cutting edge technologies that will help solve our energy problems. The ARPA-E reauthorization of 2010 adds a new goal to ARPA-E, of promoting the commercial application of advanced energy technologies. This is critically important, as the new scientific discoveries and technological innovations won't improve the Nation's energy security unless they are matured into commercial applications.

My amendment today supports this goal by increasing the minimum percentage of funds that are to be used for ARPA-E's technology transfer activities from 2.5 percent to five percent. Although my amendment strengthens the minimum percentage, it is still a small overall percentage for a program that should be promoting, accelerating, and engaging private entities, so that new technological innovations can be deployed.

Furthermore, it clarifies that such technology transfer funds should be used within the responsibilities of program directors,

mainly for identifying mechanisms for commercial application, a successful energy technology development projects, including through establishments of partnerships between awardee and commercial entities.

The movement of technology from basic research to industry application supports economic growth and creates jobs. America is positioned to be a leader in tech transfer and commercialization, but we must encourage and incentivize and invest in technology transfer activities.

I ask my colleagues to support my amendment, and I thank you for your consideration. I yield back.

Chairman BAIRD. I thank the gentleman. Does anyone else wish to be recognized? Dr. Bartlett.

Mr. BARTLETT. Mr. Chairman, this is not a role that DARPA, that DARPA plays. And I am wondering, if we can have a set aside for this, why can't we have a set aside for small business?

And then, I would like to ask a couple specific questions about some of the wording in there. The key phrases in the underlying bill language are promoting commercial applications, and identifying mechanisms for partnerships.

I had some concern about what these two words mean. Promoting sounds like it could be anything, from direct funding to put a product on the shelf, to marketing type activities. Either way, if not bounded in some way, it sounds like a blank check for potentially inappropriate activities.

It is the same story with mechanisms. What mechanisms does the majority have in mind? The bottom line is that if an awardee has developed a useful and valuable technology, the market will create a natural partnership with the awardee. What is bothersome is that one can envision the government using inappropriate pressure as one of its mechanisms in this context.

I don't think it is crazy to imagine DOE using its considerable contracting and even regulatory leverage to force partnerships. I was wondering about my concern for what these two words really mean.

Mr. LUJÁN. If the gentleman would yield.

Mr. BARTLETT. Be happy to.

Mr. LUJÁN. Mr. Chairman, if you look at the enabling legislation of ARPA-E, which is where I am amending, it is built into the allocation portion, which is under section 5(d), which states at least 2.5 percent of the amount shall be used for tech transfer and outreach activities. This is already in there, and as with DARPA, when we talk about the technological advances that have spinoff capabilities, that are making their way to market, we should be looking to create stronger programs, even in DARPA, to push these out with these out with our Air Force research labs or Army research labs.

Now, also in the enabling language, under section 2 of ARPA-E, when we look at "identifying and promoting revolutionary advances in fundamental sciences, translating scientific discoveries and cutting edge inventions, and to technological innovations, and accelerating transformational technological advances in areas that the industry, by itself, is not likely to undertake, because of technical or financial uncertainty." I think it is an enabling legislation,

when we talk about financial uncertainty about moving this forward.

Furthermore, when we heard from the Chamber of Commerce, which I know is a strong advocate of creating jobs, they also highlighted, that when possible, this committee, when providing testimony to us on January 20, Mr. Donohue: “The committee should look at incentives that lead to public/private partnerships, the commercialization of new technologies, and regional STEM initiatives. This information ecosystem drives job creation, economic development, and regional stability that will contribute to regaining America’s lead in the global innovation market.”

When we talk about COMPETES, I think that is what we are trying to achieve here, and we should look at creating these programs and expanding them, as opposed to depressing them and eliminating them.

Mr. BARTLETT. Thank you for your comments. I have familiarity with DARPA for many, many years. And ordinarily, DARPA ceases its involvement quite a long while before it enters the marketplace.

They are there to provide funds for proof-of-principle, for ideas that industry can’t support, because they are just too iffy, or there is too much risk involved, and that is the role that they play.

I am not arguing that this shouldn’t be done. I was just saying that we are now going further than DARPA does, and ARPA-E, if we are including this, because this is not a role that—I agree that this needs to be done, and if we want to make ARPA-E something different than something modeled after DARPA, then that is fine.

I was just noting the inconsistency was all. Thank you very much.

Chairman BAIRD. Further discussion? Mr. Inglis.

Mr. INGLIS. Thank you, Mr. Chairman. In terms of promotion of ARPA-E, I would point out that, as I am seeing, there are 3,700 applications and 37 awards for the first year of operation.

So, it seems like it is well promoted. First round, yeah. First round.

Mr. GORDON. If the gentleman would yield, it also says “and technology transfer,” so it is not limited to promotion.

Mr. INGLIS. So, how do we make sure that it is not, we don’t go spending a great deal of money, though, on promotion, rather than. In other words, it seems like it is well promoted; it is obviously working quite well. If you get 3,700 applications for 37 awards.

Mr. GORDON. This was, I think, put in at your request. I mean, this was, it is technology transfer also. So, this is not going to promotion. These are scientists. You know, I think they want to spend money, you know, they want the rubber to meet the road. They are not interested in, I think, a lot of hoopla. So, I don’t think we have to worry about that.

Mr. INGLIS. So, that being the case, what if we took out promotion? Maybe the gentleman can consider a friendly amendment. Just take out the word promotion, and leave it at tech transfer or something.

Chairman BAIRD. Would the gentleman yield for two points?

Mr. INGLIS. Yeah. I would be glad to.

Chairman BAIRD. First, and I will let the gentleman speak to his amendment in just a moment. Well, I won't—you will have to yield, but two points.

One, a fundamental difference between ARPA-E and DARPA that came up repeatedly in the hearings we had here and in multiple conversations elsewhere I have had, is that DARPA has a guaranteed market. The Pentagon basically says you make this, we buy it, and we don't have that market, guaranteed market, in the area of energy.

And so, the premise was that you need to do more to make sure that these things actually cross the Valley of Death kind of bottleneck Ms. Biggert talked about. So, that would be, just the first is the principle that DARPA and ARPA-E are not going to be perfectly congruent in their function, because there is not the guaranteed marketplace within DARPA.

The second thing is more of a procedural matter, in terms of, I think, this would not be a friendly, it might be a pretty complex friendly amendment. We would have to ask the clerk about it. Well, I am not sure you even want to make it, but so—

Mr. INGLIS. I am withdrawing my friendly amendment request, Mr. Chairman.

Chairman BAIRD. Is there further discussion?

Hearing none, the motion occurs on, the vote occurs on the amendment. All those in favor, say aye. Aye. Those opposed, no. The ayes have it, the amendment is agreed to.

The twelfth amendment on the roster is an amendment offered by the gentleman from South Carolina, Mr. Inglis. Mr. Inglis, are you ready to proceed with your amendment?

Mr. INGLIS. Yes, Mr. Chairman.

Chairman BAIRD. The clerk will report the amendment.

The CLERK. Amendment number 024, amendment to the committee print, offered by Mr. Inglis of South Carolina.

Chairman BAIRD. I ask unanimous consent to dispense with the reading. Without objection, so ordered. I recognize the gentleman from South Carolina for five minutes to explain his amendment.

Mr. INGLIS. Thank you, Mr. Chairman.

This amendment is consistent with some comments that I had at the beginning of ARPA-E. And when we started ARPA-E, my concern was, and other people's concern was that the Office of Science would be harmed by the establishment of ARPA-E. In other words, funds would be siphoned off from the Office of Science and directed to ARPA-E. And that gets back to this question. We were discussing here several different ways today about whether we want to preserve the basic science at the Office of Science.

And so, back then, what I proposed was that we not allow any funding for ARPA-E, unless the Office of Science kept pace with inflation in its funding. And so, what I am proposing here today is something very similar to that, and that is sort of establish a floor for the funding for Office of Science, such that it gets inflationary increases, and as long as it gets those, then ARPA-E may move up, but if Office of Science doesn't get an inflationary increase, then ARPA-E is held at this, the initial number, which is \$300 million.

So, that is the concept of this amendment, is basically, to preserve funding for Office of Science, and see that it doesn't compete against ARPA-E funding.

So, I would urge you to support the amendment.

Chairman BAIRD. Thank the gentleman. The Chairman is recognized.

Mr. GORDON. Mr. Inglis made this suggestion, this amendment during the original authorization last time, and it was accepted.

But I would say to him that that was because it was a new program, and we wanted to make sure, again, it wasn't going to cannibalize other things. I think we are seeing wide support for the Office of Science.

I would also say that I think ARPA-E is basic research in many ways, and that it is not counter to other things. I would just say this, that in keeping our ability to have flexibility in the future, we might find that there are some areas in the Office of Science that aren't doing as good as they should be doing, and that might be, and that they might come down.

But if ARPA-E is doing a terrific job, then it would be, I think, not wise to have them penalized, because someone else was not doing well. So, again, I think it just takes away the flexibility. It was a worthwhile and accepted amendment the first time out, but now, we have a proven program, and I don't think that it would be beneficial.

Chairman BAIRD. Ms. Biggert is recognized.

Ms. BIGGERT. Thank you. I would support this amendment, and I think that along with Mr. Inglis, I was always concerned about the takeover of funding from the Office of Science to provide for ARPA-E, and I think what the Chairman just said is reminiscent of the conversation we have just had with Mr. Ehlers' amendment, with the markers for the three types of research in the Office of Science.

So, I think that it was a very important distinction, when we first passed the COMPETES Act, and this was so important, I think, to this side of the aisle, that there was, that this would not affect the Office of Science, and so, I think that we should continue it.

Since we really haven't had more than just the initial granting of the ARPA-E technology, or the groups that are going to be doing something under ARPA-E.

Chairman BAIRD. Gentlelady yield?

Ms. BIGGERT. Yes, I will yield.

Mr. INGLIS. I thank the gentlelady for yielding. And to the chairman, I would say, point out that actually, that is what we would be concerned, is things get so exciting at ARPA-E that you forget about Office of Science.

In other words, it is quite possible for things to get very exciting for this quarter. And so, quarterly profits, quarterly whatever. This quarter becomes very exciting. Meanwhile, money goes toward that excitement, and the basic research that is a role, I believe, of the Federal Government, because nobody else is going to spend money on that. It is overlooked. That is exactly what we are concerned about, actually, is things getting too exciting at ARPA-E.

We want them to be exciting, but we want to make sure that we stay excited about really off the beaten path research that may turn out to be really game changing in the basic research area. So, it is, we are back to that fundamental question that we have been discussing all day, I believe.

It is the gentlelady's time. Do you want to—

Ms. BIGGERT. Yes. Yes.

Mr. INGLIS. And thank you to the gentlelady for yielding.

Ms. BIGGERT. I will yield back.

Chairman BAIRD. I recognize myself for five minutes to ask counsel. Could you share with us the current amount of authorization for the Office of Basic Science, vis-a-vis the current year for ARPA-E, and then the out year numbers?

COUNSEL. Sorry, the current year authorization for the DOE Office of Science, and the current authorization for ARPA-E?

Chairman BAIRD. Correct. Not including the ARRA funds. We will get there.

COUNSEL. Office of Science is authorized for \$5.8 billion for 2010. ARPA-E, right now, I believe, is in such sums.

Chairman BAIRD. What is the actual expenditure? Again, ARRA is a bit of a contaminant there.

COUNSEL. \$4.9 billion for Financial Year 2010 appropriated for Office of Science.

Chairman BAIRD. Okay. So, in the out years, as of 2015, what is the Office of Science authorization in this legislation proposed to you? I think it is \$8 billion something.

COUNSEL. \$8.1 billion.

Chairman BAIRD. And what would ARPA-E be?

COUNSEL. In 2015, would be \$1 billion, I think. Would be \$1 billion, I believe.

Chairman BAIRD. So, the reason I ask those, I thank counsel for that. The reason I ask those is, we are still seeing a rather generous growth in basic science, under the Office of Science, under this bill, right? I mean, it is looking, we are looking at \$2 billion increase during that time period.

Now, yes, there is enthusiasm for ARPA-E, but it is not at the neglect or expense of science. It is maintaining a core growth in science, but at the same time, allowing ARPA-E to increase. And the only other thing I would say on this is, you know, over the 12 years I have been here, it has been a pastime, I think, of some of the colleagues on the Minority side, particularly, to do reverse earmarking of science projects. And the game is often to look at a rather esoteric branch of science and say, well, we will take money from this and put it toward something that has appeal.

From the taxpayer's perspective, not to take anything away from the Office of Basic Research, but I think from the taxpayer's perspective, at a time of record, near-record unemployment, dependence on foreign oil, increasing energy prices, et cetera et cetera, I think many of the taxpayers would say darn straight, I want some of this money, a generous portion of this money, to go towards things that fairly in the near future, I can actually see a tangible benefit from.

Not to diminish the importance of basic research, but certainly, I think, the taxpayers in my districts are saying let us get some

jobs. Let us get some things that lower our energy costs. Let us get some things that make us economically competitive.

The basic research still grows in this, in this legislation. I want to underscore that. But ARPA-E would grow, has the authority under this to grow generously. So, with that, I would yield back.

Mr. INGLIS. Mr. Chairman, would you yield?

Chairman BAIRD. Be happy to.

Mr. INGLIS. My amendment speaks of appropriations, not authorization. So, the concern is, I agree with you that based on the numbers we just ran through, the appropriations are, the authorizations are generous.

It is just a question about whether the appropriations fall short of that authorization is what I am trying to do is preserve the Office of Science through the appropriations.

Chairman BAIRD. Reclaiming. I would, I recognize and respect that, but that, to me, is a further argument. This committee believes in the importance of ARPA-E. And I personally believe it. I think the evidence is compelling, that I don't want to then make ARPA-E's position dependent on an appropriator's decision on basic science.

I think we want to continue to defend our prerogative here as far as authorization, rather than making, giving them a way, I mean, we are then in a paradoxical position of having to plead with them to raise, if we want to deal with fiscal issues, to then say we are going to plead with one entity to raise one fund, so that another fund can go up. It is not a position I, as a supplicant to the appropriators, which we are too much anyway, I don't want to do that.

But I would be happy to yield. I only have 30 seconds left. I will yield to Mr. Bartlett, Dr. Bartlett, then Ms. Biggert, or I will recognize Ms. Biggert, if Dr. Bartlett—

Mr. BARTLETT. Thank you. When considering the tensions implicit in this amendment, I am reminded of the New Testament statement: "This ought you to have done, and not to have left the other undone." I am a huge supporter of basic research, but you know, considering the priorities here, we find 10 billion barrels of oil, and we heave a sigh of relief, gee, we don't need to worry anymore, do we? That lasts the world 120 days. Big deal.

So, you know, carrying on to *Animal Farm*, all animals are equal, but some are more equal than others. I think that energy research is more equal than others. So, I hope we don't call a roll call vote on this, because I am going to be conflicted. I am not going to vote against my Ranking Member, but I just, you know, I just think that if you are going to favor one side of this equation, it needs to be ARPA-E, because I think that is a bigger challenge than any other challenge in our society today. Thank you.

Chairman BAIRD. Thanks, Dr. Bartlett. I always welcome some Biblical scripture that has applied relevance to the Committee. Dr. Ehlers often provides that with us, for us. Ms. Biggert.

Ms. BIGGERT. Thank you, Mr. Chairman.

I think that we are looking at the amendment. It is just to make sure that the Office of Science is, the money is appropriated and adjusted for inflation, but really, only if the amount exceeds the previous fiscal year, then there is no cap on what ARPA-E can be.

I think it is just a check, to make sure that both of these are funded.

The other thing, we should look at some time, there is something in this legislation that allows earmarks to be taken out of the Office of Science. I have never been able to figure out why that is true, but every year, there are MRIs that come out of the Office of Science, because there is a biotech clause in there. And I think that this is a way that, you know, that we could protect more the Office of Science by doing this, and maybe we could do something by the final decision on this bill.

I mean, I think we should, you know, look at that, rather than just making sure that the Office of Science is funded. Yield back.

Chairman BAIRD. I, given, I thank the gentlelady, and I would be happy to discuss with the gentlelady the issue of earmarks, and if there is a need to address that in this, I would much prefer that we put it in, rather than giving Mr. Flake yet another opportunity to do so on the floor.

Mr. GORDON. Would the gentleman yield?

Chairman BAIRD. I would be happy to recognize the chair.

Mr. GORDON. Ms. Biggert raised that issue with me on the floor yesterday. I was surprised to hear it. We have already started the process of looking into that, and we all would like to see it corrected.

Chairman BAIRD. Thank the gentlelady for calling our attention to that.

Is there further discussion on the amendment?

If not, then the vote occurs on the amendment. Those in favor will say aye. Those opposed, no. No. In the opinion of the chair, the nos have it. The amendment is not agreed to.

In the opinion of the chair, Mr. Ehlers needs a hearing aid. There are times when there are exceptions to that auditory rule, I have noticed, on the floor, particularly.

The thirteenth amendment on the roster is an amendment offered by the gentlelady from Texas, Ms. Johnson. Ms. Johnson, are you ready to proceed with your amendment?

Ms. JOHNSON. Yes. Yes, Mr. Chairman. I have an amendment at the desk.

Chairman BAIRD. The clerk will report the amendment.

The CLERK. Amendment number 104, amendment to the committee print, offered by Ms. Eddie Bernice Johnson of Texas.

Chairman BAIRD. I ask unanimous consent to dispense with the reading. Without objection, so ordered, and I recognize the gentlelady for five minutes to explain her amendment.

Ms. JOHNSON. Thank you very much, Mr. Chairman and Ranking Member. As newer tools are revolutionizing our energy sector, we will be creating an entirely new green economy with jobs for workers who have been displaced over the years. Ensuring that the people in low income communities and people of color are prepared for this transition is critical, not just for these citizens, but also, for our country.

My amendment specifies for one award, to be granted to an HBCU or 1890 Land Grant institution, a Hispanic serving institution or a PBI or a tribal college. Together, these are hundreds of universities, which represent every corner of our Nation. My

amendment also gives special consideration to at least three of these universities, one of each category.

I would like to thank my good friends and colleagues, Representative Bobby Rush and Representative G. K. Butterfield, for their hard work on this language, which has broad tripartisan support.

The development of Green Energy Centers of Excellence at historically black colleges and universities, Hispanic serving institutions, and tribal colleges, to research and develop new green technologies, as well as train implementers in the deployment of green innovation is a move toward parity in a growing clean energy economy.

These universities maintain unique relationships with communities of color, and we should implement their ability to educate these communities on the opportunities in green industries, and the techniques needed to succeed in a larger energy strategy.

Historically, most historically black colleges and universities, and other minority serving institutions do not have the same endowments, funding, grant-writing capabilities, and luxuries other universities have. Despite these challenges, HBCUs have managed to graduate students in STEM fields at a higher rate than most traditional universities.

The fraction of college age population ages represented by minorities is expected to grow to 55 percent in 2050. However, minorities still face barriers pursuing STEM careers. The United States will not be able to produce enough scientists and engineers in future years who do not address these issues now.

The proportion of STEM master's degrees earned by minorities is much lower than the representation of minorities within the U.S. population. In order to keep America competitive in future years, we do have some work to do. The bills for our consideration today focus on particular weaknesses in our national scientific enterprise.

I, and many of our colleagues from the Tri-Caucus and the Diversity and Innovation Caucus, believe this amendment will strengthen the intent of this legislation.

As legislators, we have seen the statistics showing minorities are falling behind the rest of the pack in sciences. We are now interested in policy directions to correct these statistics.

I ask my colleagues on this committee to support this amendment, to increase diversity in our growing clean energy economy.

Mr. Chairman, I have never attended a historically black university, nor a minority serving university, but I know what it means to this society for them to be operating. I have seen far too many successes coming from these universities to ignore them. Many of them are first generation students. Many of them are very nervous, and cannot really survive on a majority campus, because they have not been accustomed to that environment.

So, I would please ask the Committee to help to get these students up to par.

I thank you, Mr. Chairman and Ranking Member, and I yield back the remainder of the time.

Chairman BAIRD. Is there further discussion on the amendment?
Mr. Inglis.

Mr. INGLIS. Mr. Chairman, I certainly am sympathetic to the idea of special consideration, the challenge here is we only start out

with three Hubs, so if we are going to give special consideration to three Hubs, then it pretty quickly becomes sort of a suggested number, and it is the entire program.

So, it seems to me that the wise thing to do is just take the number out. If the gentlelady would just take out the, at least three awards, does not state a number, but suggests special consideration, I think that would be acceptable. It is just a special consideration, but when you establish a number, especially if it is 100 percent of the number of Hubs, that seems problematic.

And so, thank the—

Chairman BAIRD. Would the gentleman yield back?

Mr. INGLIS. I yield back.

Chairman BAIRD. Mr. Garamendi.

Mr. GARAMENDI. I think the Hubs are not necessarily on one campus. I think they can be multiple campuses, or locations. I will use the word campus in its broadest sense. It might be a research laboratory, it might be a university.

But if it is a Hub, and I agree with the three issue. I think you are correct about that. But it may be that the, that instead of the Hub being a single university campus, it may be that one or more of the serving institutions may be part of one or more Hubs. And I think we just have a little language issue here, about what we are actually trying to accomplish. And we are trying to spread the Hubs out to these historic serving campuses, but not only on that campus.

Mr. LUJÁN. If the gentleman would yield. Mr. Chairman, I think that Mr. Garamendi describes that precisely the way that it would work.

We worked on similar language during the debate with ACES, if the Members will recall, to allow for these partnerships to take place as well, and so, although the target wouldn't be those campuses, it would be to make sure that these campuses would be included in the discussion, and in coming up with the solutions necessary to make sure that they are part of the solution.

Chairman BAIRD. Mr. Garamendi, do you yield back?

Mr. GARAMENDI. If I, if the Chair can inquire of counsel.

Chairman BAIRD. I am a strong advocate of making sure we expand opportunities for historically black colleges and other minority and women serving institutions, but I have a question about this, and help walk me through it. My understanding of the Hubs is that there is intended to be some degree of geographical centrality and coordination.

In other words, this is not a dispersed electronic collaboration, but the idea is analogous to the Bell Labs model. The idea is to put researchers focused on a common focus, specific goal, together in one area, to hammer away at that goal, in an Apollo-like or Manhattan-like or Bell Labs-like model. Is that accurate?

COUNSEL. That is accurate, where practicable.

Chairman BAIRD. The challenge I have is, then, comparable to Mr. Inglis? If that is the case, and my understanding is there is a relatively small number of Hubs to be created. I think Secretary Chu looked at eight proposals over some period of time.

How many hubs do we envision being created?

COUNSEL. The legislation is currently silent on the number of Hubs to be created. For right now, three are appropriated, and one is requested for Financial Year 2011. So, there is—

Chairman BAIRD. But there is, okay, so three are appropriated, one is requested. There are a fairly small number.

COUNSEL. An additional is requested for Financial Year 2011.

Chairman BAIRD. Okay. But there is, even if we set aside the numbers, there is also some realistic, practical constraints, in terms of how much funding is to be given to these.

COUNSEL. Yes, the Administration indicated in the Financial Year 2010 budget that eight would be, would ultimately be created.

The funding levels in the authorization of appropriation envisions eight, ultimately, being created. However, the number in the bill, the number of Hubs in the bill is not specified.

Chairman BAIRD. My problem here is this. I mean, there are, if we accept this premise that a Hub is meant to be a geographically centralized location, and given a relatively constrained number of potential Hubs to be created, it seems to be that we are very particular, I don't have a map off the top of my head, of these particular, of the distribution of these particular institutions that qualify.

Maybe someone can enlighten me. Are we not de facto saying that the Hubs can only go to certain places and not to others? Mr. Tonko—

Mr. GORDON. If the Chairman would yield.

I think, again, the premise we all agree with is that there should be an outreach effort here. I guess what I would say is probably the thing to do is maybe to agree to the amendment, and then, work with Ms. Johnson between now and the Full Committee, to see if there should be, you know, any kind of changes, in terms of numerical.

But at least, I think we all agree that there should be this concept of a sensitivity to those institutions.

Chairman BAIRD. Yeah, reclaiming my time. The challenge, and I will get to Mr. Tonko in just a moment. The challenge I face is, it is not, I don't think the issue is just numerical.

I think the issue is the fundamental core concept of what constitutes a Hub, and what constitutes, I am lacking the word.

Mr. GORDON. I think it is frontier.

Chairman BAIRD. Consortia. So, the point being, it would be one thing if you say we want collaboration, because we want to encourage involvement, but you pick a university and say, you can collaborate from afar. I mean, if the best applicants for the job are located there, terrific, fantastic.

But to say that, it seems to be that effective, we are ruling out a very, we are effectively ruling out a very large portion of the country.

Mr. Tonko.

Mr. TONKO. Mr. Chair, I believe the vision here is to model after those existing success stories, which then defines the Hubs as single focus, with multi-discipline, multi-investigator, multi-institution. So, multi-institution, for a single Hub, means the incorporation of a number of those concepts, I think, where you could then,

in the spirit of the Congresswoman's amendment, bring in her intention.

They are, by design, supposed to have a central location, a core, grounded central location, but it is still multi-institutional.

Chairman BAIRD. Reclaiming my time. I think that is correct. My concern is, my understanding of the premise of the Hubs: Bell Labs was not—my understanding, and I can't speak for the Secretary, but maybe counsel can advise. If you look at Apollo, if you look at the Manhattan Project, now yes, there were various areas of the country that worked together. Mr. Luján knows this better, but coincidentally, my father was at school at Los Alamos Boys School, and the Federal Government came by and said kids, you have got to leave. There is something special going to happen here.

And the premise was, that he had asthma, which is why he was out there. So, the premise was that we are going to get all these really bright people together in one place, so that you go across a hall, work on the chalkboard, and solve the problem. Now, that was pre-Internet days, et cetera, but the idea was we are going to put everybody together, so they are able to hammer away at this one objective together, physically and proximally.

And I understand, my understanding is that is part of what this Hub thing is about. And so, my concern, then, is if we then, we are basically saying many parts of the country can't actually compete, that is my concern. And I am really worried about this. Though I am passionate about involving minorities in this issue.

My time has expired, but did counsel want to comment on this?

COUNSEL.—to get a Hub. And then, Hubs are ideally located under one roof, but that does not preclude that other participants outside of this one centralized location can participate.

Chairman BAIRD. Ms. Johnson.

Ms. JOHNSON. Yes.

Chairman BAIRD. Mr. Garamendi. Actually, I will recognize Mr. Garamendi, and then get back to Ms. Johnson.

Ms. JOHNSON. Mr. Chairman, he described that correctly. What—that—this has been on much discussion, and has already passed the House on another bill, that has stopped in the Senate.

Now, we know that these Hubs will be located around the country. There are concentrations of these sorts of black colleges in the South. There are concentrations of the participating Indians are in the West. And the majority of the concentrations of Hispanics, for the most part, are in the Southwest.

And there will be consortiums around these areas. This just means that, to try to include them in that consortium. And it started out, in the original language, having lots of them, but we decided that if we do it by consortium, at least one historically black college, at least one Hispanic serving institution, and at least one Indian serving institution, could be included geographically within a Hub.

Mr. GORDON. Would the gentlelady yield?

Ms. JOHNSON. Sure.

Mr. GORDON. I think what we have here is, the Hub concept is geographic, as Chairman Baird said. It is trying to get people there working together, but as a practical matter, there is no place in the United States where everybody is already there.

And so, if you were going to have a Solar Hub, for example, it may very well go to the University of Arizona, but if you have a specialist at Columbia University, or another one at Berkeley, another one at Fisk, then, they might take sabbaticals and relocate there.

Chairman BAIRD. Is it, if I may, is it the Chairman's belief that that would fit as part of the, qualifying as part of the member of the consortia, if faculty.

Mr. GORDON. That would be my understanding, yes. In other words, you could have Fisk University participate, either at, they could be the Hub there, you know, there at their campus or in that area, or they could be a part of something going on at Berkeley, California.

So, they would partner, but again, no single area would have a monopoly on all of the best personnel. Now, and, but, and what we have here, I will just go a little bit further, as Ms. Johnson said, this basically is the language that passed on an Energy and Commerce bill that had a larger number of Hubs.

And so, we are sort of, to some extent, we are taking this compromise language from one bill and putting it somewhere else. I think it probably is appropriate, but it can also have more discussion, I think, between now and our final—

Chairman BAIRD. The gentleman's point is well taken. I just, and I note that, for the record, that Ms. Johnson was nodding when we noted, the premise is not necessarily that the location of the Hub must be determined geographically by the location of said institution. Their participation in the process, and the focus of the Hub, is what matters. So, that there could be an inclusiveness in that, but not necessarily a de facto mandate that there only be certain geographical. With that clarification, I am much more comfortable with this, and appreciate the indulgence.

Mr. INGLIS. Would the gentleman yield, or whose time is it?

Chairman BAIRD. I will recognize the gentleman.

Mr. INGLIS. Well, I was just, I think that if we are going to discuss it between now and Full Committee, the better approach is to not include this now. To include it now, with such question about it, seems unwise.

It seems wiser to wait until the Full Committee, and work out the language, because at this point, we are talking about a specific number, on an amendment that doesn't seem like it fits with the overall bill.

And so, I don't know why we would want, as a committee, subcommittee, to lock ourselves into a three number, and then need to change that at Full Committee. Why don't we just leave it out now, and discuss it as we move toward the Full Committee?

And I would signal to you that, at least from my perspective, the best way to do that is to have no numerical indication there, because it is better to say special preference or special consideration be given, without establishing a number. Because the numbers are all moving around here. And it would, it seems unwise to set a specific number.

Ms. JOHNSON. May I just comment on that?

Mr. INGLIS. Would be happy to yield.

Ms. JOHNSON. Mr. Inglis, I don't mind waiting until we get to the Full Committee. But the intent of this language was to make sure that only, not to put these institutions in a lot of competition with each other, but to make an opportunity where each category can have an opportunity to participate.

And that is really what we came down to. If you, I don't know if you remember, the original language had like 15 and 16, and but it was pulled down, as we, as the Tri-Caucus discussed it, and the Innovation Caucus discussed it, we put it where there could be an opportunity for one from each general location, I mean, description to participate, and not make it look as if they had to compete among each other. That is why three was put there.

Chairman BAIRD. I appreciate the clarification. One of the things we have done today at several points is agreed to work on language in the interim, and not necessarily consider. We did this with amendments prior, I think from both sides, if I am not mistaken, where we have said look, we will, we may pass this now, but we are still going to revisit the language.

And it sounds to me, like, that we are getting, that we are of a common purpose here, and we want to revisit this. And again, the Chairman has raised the point that there are some concurrency with language passed by other committees, that we want to be able to discuss those.

My understanding is that this language is concurrent with language already in existence, the letter of this language. Is that right? Can I refer to counsel, that language already exists?

COUNSEL. This is consistent with language that was in what is known as the Waxman-Markey bill, in the House-passed version.

Chairman BAIRD. Okay. Well, since that is not going anywhere, we might want to revisit. That is not, that is hardly written in stone, unless it is some kind of soapstone.

What I think, at this point, we have heard the points. My point really, facetiousness and silliness aside, we are not bound by that. It is not existing law, and it is up to question whether it will become that.

But my encouragement would be that we pass, we move to the vote on the amendment, but with an agreement that we get together and discuss some of these points, and that we may want to do it, I would have to ask the Chairman, because he will be managing the full bill, that we would discuss some of the finer points between now and then. Is that—

Mr. GORDON. It is Ms. Johnson's amendment, but I will certainly, would feel comfortable with that.

Chairman BAIRD. Is the gentlelady, in other words, willing to put this amendment up for a vote, as is, and, but if it is to pass, that we would also have some further discussion, to clarify some of these points?

Mr. Inglis, did you have a final comment before the roll call?

Mr. INGLIS. If that is where we are headed, then I want to offer a second degree amendment to the amendment.

Chairman BAIRD. The gentleman will state his amendment. So, is there an amendment at the desk?

Mr. INGLIS. Not yet. Get it down to the desk.

Chairman BAIRD. So, okay, let us write something down.

Mr. INGLIS. It is scratching out the first, to the first comma. Lines 1 and 2.

Chairman BAIRD. Read the omitted line and then, we will hand the written copy to counsel.

Mr. INGLIS. It just takes out the words, "For at least three awards to consortia under this section," so it would, and then, it would make an initial cap on "the" for "The Secretary." So, it just takes out one.

Chairman BAIRD. Can we, can counsel photocopy that and make it available to the Members, please?

Mr. INGLIS. It takes out the first ten words.

Chairman BAIRD. And it is what page, again, Mr. Inglis, so Members can look in their folders?

Mr. INGLIS. It is page 1 of Ms. Johnson's—

Chairman BAIRD. Oh, sorry, you are just amending her amendment, sorry.

Mr. GORDON. Mr. Chairman, if you, it might, having a little sub-conference here. I think that some Members on this side would prefer, rather than get into this ad hoc amending right now, that we just not go forward with this amendment, and try to look at it in a more holistic way, rather than, again, try to get down to fine language through pieces of paper back and forth.

If that would be, again, as Ms. Johnson is the, would have to do that.

Chairman BAIRD. So, we would presumably, counsel, have to ask Mr. Inglis to withdraw his amendment to Ms. Johnson's amendment, and then, she would withdraw her amendment, or if he, if she just withdraws her amendment, that obviates his withdrawal, is that correct?

So, is that the way the gentlelady wishes to proceed? Ms. Johnson. Yes, so if you withdraw your amendment, then it obviates his need to withdraw it. So, does the gentlelady wish to withdraw her amendment? Then that, then, takes care of his amendment to your amendment, because there is nothing to amend. If we get much more complex, I will be lost.

Ms. JOHNSON. Yeah. Well, what I would like to is adopt the language and be open for looking at it a second time in Full Committee.

The amendment that he is offering to this amendment actually guts it, after lots of deliberation and working with a number of people outside this committee.

So, I do have some concern about gutting it before we agree to look at it in Full Committee. I would rather have it adopted as it is, and leave it for review when we get there.

Perhaps we can get even more background as to how this was arrived.

Chairman BAIRD. So, the gentlelady does not wish to withdraw her amendment, is what I am hearing. The gentleman is entitled to offer his amendment if he so chooses.

And do you have an amendment at the desk?

Mr. INGLIS. Yeah, I want to continue with the amendment.

Chairman BAIRD. The clerk will report the amendment to the amendment.

The CLERK. Does everyone have a copy of the amendment?

Chairman BAIRD. I thought it had been distributed. Has it?

Mr. INGLIS. No.

Chairman BAIRD. Oh, I am sorry. I apologize. I thought I saw staff passing something out. My apologies. We will wait until we receive that amendment. I am being instructed by counsel that technically, this would qualify as a substitute to Ms. Johnson's amendment, because you are not adding language. We are replacing the whole legislation with the existing text of Ms. Johnson's minus those stricken words.

Ms. BIGGERT. Mr. Chairman.

Chairman BAIRD. Yes, Ms. Biggert.

Ms. BIGGERT. Since this is getting more and more complicated, it appears to me that, how long have we spent on this now, about 45 minutes, it seems like, that I would recommend that we, you know, let this go, and come back for the final.

Ms. JOHNSON. Why don't we vote on the substitute?

Chairman BAIRD. Well, we will, Ms.—if that is dependent on the wishes of Mr. Inglis, who is offering the substitute, but we have to get the text to the Members. Unless Mr. Inglis wishes to withdraw that, we would have to get the text to the Members before we vote on the substitute. So, we are awaiting that, and if that should be pretty quickly available to us. Unless Mr. Inglis wishes to change his position.

You have the text here. It is up to Mr. Inglis. If he wants to proceed, we will distribute the amendment, and call a vote on the amendment in the nature of a substitute.

Mr. GORDON. Mr. Chairman, I would suggest that he is not changing his position, just waiting to do it until a later time.

Chairman BAIRD. That is dependent on Mr. Inglis.

Mr. INGLIS. You know, I liked the Chairman's suggestion, that we just wait until Full Committee on this. The gentlelady from Texas is not agreeable to that position. So, therefore, I am maintaining my position, which is it is not wise to set in stone a number, in this subcommittee, waiting for moving to full committee.

But I would very much appreciate the Chairman's suggestion, that we agree to discuss this between here and Full Committee, in which case, I would be happy to withdraw the amendment.

Chairman BAIRD. I would like the staff to distribute Mr. Inglis' proposal, so people know what we are talking about here. Distribution does not prejudge whether we will actually take action on it, but at least Members have it before them.

Mr. BARTLETT. Mr. Chairman.

Chairman BAIRD. Yes, Mr. Bartlett.

Mr. BARTLETT. I would concur with the Chairman of the Full Committee's concern. One way of interpreting this amendment is, if we are going to have, and the words "at least three awards to consortia," and if we are going to have three Hubs, you could interpret this that all three Hubs are going to go to these minorities.

And I am sure that is not her intent.

Ms. JOHNSON. No. That is not what the amendment says.

Mr. BARTLETT. But obviously, the amendment needs more work, so that it wouldn't be confusing. Wouldn't you agree?

Chairman BAIRD. It is not for me to agree. Did anyone wish to respond to Mr. Bartlett's point? Mr. Luján.

Mr. LUJÁN. Mr. Chairman, what the amendment simply does, it says that if it is Yale, MIT, or Pitt that gets the award, that they just have to have a partnership with one of these qualifying institutions to be able to do this wonderful work.

It is not saying that this has to go a specific institution that is of one of these classifications. And that is simply what it says. And so, it is simply saying that these various minority serving institutions will be included as part of this discussion.

Mr. GORDON. If the gentleman would yield. It doesn't really say that. I mean, it says they should be given consideration. It doesn't say that you are mandated to have one. So, that should be clear.

It says, "the Secretary shall give special consideration to applicants in which one or more of these institutions," and it goes on, so it doesn't mandate you. You do not have to have one of these. You know, but if you, I guess, if you did, if there was a point score or something of this nature, it would give you additional points, but it doesn't make you.

Chairman BAIRD. All other things being equal, Mr. Chairman.

Mr. INGLIS. Except it says three, in which case, there is a number.

Mr. GORDON. Well, because there is three different groups.

Mr. INGLIS. Yeah, but there is, but it establishes a number. It is three.

Mr. BARTLETT. It says at least three awards. So, the language is conflicting. It is not consistent.

Mr. GORDON. Well, I think it is because there are, it is, there are three Hubs that are currently set up. So, all three.

Mr. INGLIS. Well, it is open to different interpretation.

Chairman BAIRD. So, all three of the ones that are currently set up, but therefore—

Mr. GORDON. Or excuse me, not set up, but rather, appropriated for.

Mr. INGLIS. But Mr. Luján is correct, all three must have a partner, which would be a 100 percent.

Chairman BAIRD. Let me ask the counsel to give us an opinion on this, because my reading is more closely aligned to Chairman Gordon's reading, that it is, that the letter of the law, or the letter of the proposed amendment, is not saying that all three must have a partner.

My reading is that for at least three of the awards, consideration must be given, but that does not mandate, consideration does not mandate selection for an award.

COUNSEL. That is counsel's interpretation as well.

Chairman BAIRD. Does that clarify?

Mr. INGLIS. Well, Mr. Chairman, the thing that is really odd about that is, wouldn't you want to have 100 percent consideration? Why would we want to have three consideration, if that is consideration? I mean, I should think that we would want 100 percent consideration.

Mr. LUJÁN. Mr. Chairman, does that mean that we should say for all appropriated?

Mr. INGLIS. Actually, that is what my amendment does, is it takes out the three, in which case 100 percent have consideration. Yes, I would be happy to add the words, something like in all

cases, the Secretary should give consideration. That would be a good idea.

Chairman BAIRD. Let me ask the opinion of counsel. Would the addition of the 100 percent, or is the absence of the three not implicit? Does that not contain within the assumption of 100 percent?

So, in other words, rather than amending his amendment, he has already accomplished, I think.

COUNSEL. It is our interpretation, by striking the language Mr. Inglis has asked to strike, the Secretary shall give special consideration to all applications.

Chairman BAIRD. And again—

COUNSEL. In which one or more of the institutions, under subsection (B)(1)(a), are 1890 Land Grant institutions, et cetera.

Chairman BAIRD. And then, again, for purposes of clarification again, to echo Chairman Gordon's point. Special consideration does not mandate that the selection include that the ultimate selection includes said institutions, merely that in the process of reaching that determination, they get consideration, those which reach out.

So, it is advantageous for an applicant to seek such consideration, but it is not prescriptive about whether you will or will not get it.

COUNSEL. It would be speculative for counsel to say whether it is advantageous or not.

Chairman BAIRD. Right. Okay. Fair enough. But our intent here, the letter of the language, with Mr. Inglis' modification, there is for clarification to my colleagues, and according to counsel here, is not saying that the ultimate selection must have one of the designated institutions, merely that special consideration must be given to such institutions in the application process.

COUNSEL. That is correct.

Chairman BAIRD. Correct. Is that, Mr. Garamendi?

Mr. GARAMENDI. I thank you for the clarification. We are getting closer and closer, and perhaps, we are getting a little further away from a solution here.

Part of the problem is that the specific language in the rest of the bill speaks to the physical location, which was the issue that the chairman brought up at the outset.

I think we need to be really cautious here about the way in which all of this comes together. I think it is very clear where the Committee wants to go, which really reflects what Mr. Luján said, is that, as part of a consortium, these institutions should be given. Let me restate that. In an application for a Hub, a consortium that includes these institutions should be given special consideration.

The problem lies in the other sections of the bill, which speak to a physical location. And in that regard, when you combine these two things, we get a complexity. And I think we need to do a little bit more wordsmithing here, so that we don't direct the physical location to a place where it may not be appropriate, not because of the quality of an institution, but rather, because of what the institution may have available in resources for that particular Hub.

A little more wordsmithing, and we will get there. Whether we do it as a full committee or not is a question that has been raised by several, and I don't have an answer to that, but I don't think we are home yet.

Chairman BAIRD. Other comment, Mr. Luján.

Mr. LUJÁN. Mr. Chairman, along the lines of Mr. Inglis' amendment, I would ask unanimous consent to carry out what I believe the intent of this is, to add the word "all" on line 3, after the word "to," so that it would read "the Secretary shall give special consideration to all applications in which one or more of the institutions under subsection," as the language goes on.

Chairman BAIRD. I am sorry, Mr. Luján. I, first of all, I think we would probably need, and I will ask counsel, we would probably need that in writing, rather than you see, I don't know, but I didn't see, I, as you read it, I didn't hear the change. Can you say it again? But I think we—

Mr. LUJÁN. On line 3, after the word "to."

Chairman BAIRD. Oh, I see. I see. I got it.

Mr. LUJÁN. Add the word "all" before applications. Because it is my understanding that this should be given consideration for all applications, and I think that clarifies that we want to give this for all applications.

Chairman BAIRD. No. I will ask counsel to opine about that.

COUNSEL. Our interpretation is that would change the meaning of this introduction, which would, to say instead of "all awards," to say "all applicants," would mean something different, so—

Mr. LUJÁN. Mr. Chairman, if I could seek clarification. It is not "applicant." It is "applications."

COUNSEL. I mean "applications," so "all applications."

Mr. LUJÁN. So, the applications. So, how is that different than what we are doing here by simply saying the Secretary shall give special consideration to applications? Isn't applications, on all applications? Is there a difference between when you describe applications, that it only means a portion of the applications, instead of all the applications?

Chairman BAIRD. If the Chair can offer an opinion here at this point.

Mr. GORDON. I think if the Chair would yield to Ms. Johnson.

Chairman BAIRD. Yes, Ms. Johnson.

Ms. JOHNSON. Yes, Mr. Chairman. What I don't want to do is put a lot of language in here that makes it more vulnerable for defeat, which I think that is the way we are probably headed.

In view of that, I would like to ask that it be postponed, and ask Mr. Inglis if he would work with us between now and Full Committee, on some language that he, perhaps he can agree with. I don't expect him to agree with too much.

Mr. INGLIS. I think, I accept that suggestion. I think we can work together on that. I think it is the wisdom of the Chairman down there that suggested that about 20 minutes ago.

Ms. JOHNSON. I know, but you kept chugging it.

Mr. INGLIS. No, actually, I tried to accept the Chairman's suggestion.

Chairman BAIRD. I think we have reached a good point, at which we can—

Ms. JOHNSON. Your language is a giant killer.

Chairman BAIRD. If the gentlelady wishes to withdraw her amendment, pending further discussion, and with the gentlelady's withdrawal, the chair would—

Mr. GORDON. Or delay might be a better term.

Chairman BAIRD. Or if she will delay her amendment until—

Mr. GORDON. Withdraw it now until later.

Ms. JOHNSON. Postpone the consideration.

Mr. GORDON. Until the Full Committee.

Chairman BAIRD. Okay. That is fine. Delay consideration until Full Committee, but with an agreement, collegial agreement to work on this, with the advice of counsel. I think that is the point we have reached. We are not going to be able to solve this right now, and with words. The general sense is, I think there is strong agreement. We want to promote active involvement by the institutions designated in this amendment. I think that is there. I share with Mr. Garamendi the issue of the complexity of the physical location. So, I will ask of my colleagues to work together on this between now and final consideration by the Full Committee, and hope that we can reach some kind of concurrence on this.

Are there any other amendments that anyone wishes to offer?

If no, then the vote is on the committee print, as amended. All those in favor will say aye. Aye. All those opposed, no.

In the opinion of the Chair, the ayes have it. I recognize myself. Mr. Inglis.

Mr. INGLIS. Mr. Chairman, if I may. And two other questions of counsel, if that is okay.

Chairman BAIRD. Well, I don't know. It probably is, just as a courtesy I think that train may have left the station, but just let us get the questions on the record, so that we can have that for consideration in the further deliberations.

Mr. INGLIS. Okay. So, I thank the Chairman for his indulgence. One is, would the Hub model be available to challenges associated with transportation technology or fossil fuel efficiency?

COUNSEL. It is counsel's interpretation that yes, it would be.

Mr. INGLIS. Great, and several of the Hub priorities seem to call on work ongoing at the Department of Energy. For example, the Administration is proposing to fund batteries, an Energy Storage Hub in the Financial Year 2011 budget. Similar work is currently ongoing at ARPA-E, Energy Frontier Research Centers, and Energy Efficiency and Renewable Energy. It doesn't sound like, it doesn't sound responsible to fund the same work in three different places, let alone four.

Are there measures in this bill to prevent duplication of efforts at DOE?

COUNSEL. As the Hubs are defined, we see that there is no duplication. There are intersections, but they do not run parallel to programs that are being done by DOE.

Mr. INGLIS. So, the—is, I guess our question is, is there anything in the bill that prevents that sort of duplication, or—

COUNSEL. I will refer to page 34, subsection (3), Coordination. "The Secretary shall ensure the coordination of and avoid unnecessary duplication of the activities of Hubs, with those of other Department of Energy research entities."

Mr. INGLIS. So, there is an intent there to avoid that duplication that we were just identifying here.

COUNSEL. There is.

Mr. INGLIS. Thank you, Mr. Chairman.

Chairman BAIRD. Thank you, Mr. Inglis.

With that, I move that the Subcommittee favorably report the Committee print, as amended, to the Full Committee.

Furthermore, I move that staff be instructed to prepare the Subcommittee report, and make necessary technical and conforming changes to the print, in accordance with the recommendations of the Subcommittee.

The question is on the motion to report the print favorably. Those in favor of the motion will signify by saying aye. Aye. Opposed, no. The ayes have it. The print is favorably reported.

Without objection, the motion to reconsider is laid upon the table.

Members will have two subsequent calendar days in which to submit supplemental Minority or additional views on the measure.

I want to thank the Members, and particularly, also, the staff for their diligent work on this, and look forward to final markup.

This concludes our subcommittee markup.

[Whereupon, at 1:00 p.m., the Subcommittee was adjourned.]

Appendix:

COMMITTEE PRINT, SECTION-BY-SECTION ANALYSIS, AMENDMENT
ROSTER

[COMMITTEE PRINT-DEPARTMENT OF
ENERGY]

MARCH 22, 2010

1 **TITLE I—OFFICE OF SCIENCE**

2 **SEC. 101. SHORT TITLE.**

3 This title may be cited as the “Department of Energy
4 Office of Science Authorization Act of 2010”.

5 **SEC. 102. DEFINITIONS.**

6 Except as otherwise provided, in this title:

7 (1) **DEPARTMENT.**—The term “Department”
8 means the Department of Energy.

9 (2) **DIRECTOR.**—The term “Director” means
10 the Director of the Office of Science.

11 (3) **OFFICE OF SCIENCE.**—The term “Office of
12 Science” means the Department of Energy Office of
13 Science.

14 (4) **SECRETARY.**—The term “Secretary” means
15 the Secretary of Energy.

16 **SEC. 103. OFFICE OF SCIENCE ACTIVITIES.**

17 (a) **IN GENERAL.**—The Secretary shall carry out,
18 through the Office of Science, research, development, dem-
19 onstration, and commercial application activities in science
20 supporting the missions of the Department, including pro-
21 grams on basic energy sciences, biological and environ-

1 mental research, advanced scientific computing research,
2 fusion energy sciences, high energy physics, and nuclear
3 physics.

4 (b) SUPPORTING ACTIVITIES.—The activities de-
5 scribed in subsection (a) shall include providing for rel-
6 evant facilities and infrastructure, analysis, coordination,
7 and education and outreach activities.

8 (c) OTHER AUTHORIZED ACTIVITIES.—In addition to
9 the activities authorized under this title, the Office of
10 Science shall carry out such other activities it is author-
11 ized or required to carry out by law.

12 (d) COORDINATION AND JOINT ACTIVITIES.—The
13 Department's Under Secretary for Science shall ensure
14 the coordination of activities under this title with the other
15 activities of the Department, and shall support joint activi-
16 ties among the programs of the Department.

17 **SEC. 104. BASIC ENERGY SCIENCES PROGRAM.**

18 (a) PROGRAM.—As part of the activities authorized
19 under section 103, the Director shall carry out a program
20 in basic energy sciences, including materials sciences and
21 engineering, chemical sciences, biosciences, and geo-
22 sciences, for the purpose of providing the scientific founda-
23 tions for new energy technologies.

24 (b) USER FACILITIES.—

1 (1) IN GENERAL.—The Director shall carry out
2 a program for the construction, operation, and main-
3 tenance of national user facilities to support the pro-
4 gram under this section. As practicable, these facili-
5 ties shall serve the needs of the Department, indus-
6 try, the academic community, and other relevant en-
7 tities to create and examine new materials and
8 chemical processes for the purposes of advancing
9 new energy technologies and improving the competi-
10 tiveness of the United States. These facilities shall
11 include—

- 12 (A) high-intensity light sources;
- 13 (B) neutron sources;
- 14 (C) electron beam characterization centers;
- 15 and
- 16 (D) nanoscale science research centers.

17 (2) FACILITY CONSTRUCTION AND UP-
18 GRADES.—Consistent with the Office of Science’s
19 project management practices, the Director shall
20 support construction of—

- 21 (A) the National Synchrotron Light Source
22 II; and
- 23 (B) a Second Target Station at the Spall-
24 ation Neutron Source.

25 (c) ENERGY FRONTIER RESEARCH CENTERS.—

1 (1) IN GENERAL.—The Director shall carry out
2 a grant program to provide awards, on a competi-
3 tive, merit-reviewed basis, to multi-institutional col-
4 laborations or other appropriate entities to meet en-
5 ergy research, development, demonstration, and
6 commercial application needs identified in—

7 (A) the Grand Challenges report of the De-
8 partment’s Basic Energy Sciences Advisory
9 Committee;

10 (B) energy-related Grand Challenges for
11 Engineering, as described by the National
12 Academy of Engineering; or

13 (C) other relevant reports identified by the
14 Director.

15 (2) COLLABORATIONS.—A collaboration receiv-
16 ing a grant under this subsection may include mul-
17 tiple types of institutions and private sector entities.

18 (3) DURATION.—Grants shall be provided
19 under this subsection to a collaboration or entity for
20 a period of not more than 5 years. Grants may be
21 renewed for an additional 5 years on a competitive,
22 merit-reviewed basis.

23 (4) NO FUNDING FOR CONSTRUCTION.—No
24 funding provided pursuant to this subsection may be

1 used for the construction of new buildings or faci-
2 ties.

3 (d) ACCELERATOR RESEARCH AND DEVELOP-
4 MENT.—The Director shall carry out research and devel-
5 opment on advanced accelerator technologies relevant to
6 the development of Basic Energy Sciences user facilities,
7 in consultation with the Office of Science’s High Energy
8 Physics and Nuclear Physics programs.

9 **SEC. 105. BIOLOGICAL AND ENVIRONMENTAL RESEARCH**
10 **PROGRAM.**

11 (a) IN GENERAL.—As part of the activities author-
12 ized under section 103, the Director shall carry out a pro-
13 gram of research, development, demonstration, and com-
14 mercial application in the areas of biological, climate, and
15 environmental systems science to support the energy and
16 environmental missions of the Department.

17 (b) BIOLOGICAL SYSTEMS SCIENCE SUBPROGRAM.—

18 (1) SUBPROGRAM.—As part of the activities au-
19 thorized under subsection (a), the Director shall
20 carry out a subprogram of research, development,
21 and demonstration on fundamental, structural, com-
22 putational, and systems biology to increase systems-
23 level understanding of complex biological systems,
24 which shall include activities to—

1 (A) increase cost-effective sustainable pro-
2 duction of biomass-based liquid transportation
3 fuels, bioenergy, and biobased products that
4 minimize greenhouse gas emissions;

5 (B) remove carbon dioxide from the atmos-
6 phere, through photosynthesis and other bio-
7 logical processes, for sequestration and storage;
8 and

9 (C) destroy, immobilize, or remove con-
10 taminants from subsurface environments, in-
11 cluding at facilities of the Department.

12 (2) RESEARCH PLAN.—Not later than 1 year
13 after the date of enactment of this Act, and at least
14 once every 2 years thereafter, the Director shall pre-
15 pare and transmit to Congress a research plan de-
16 scribing how the subprogram authorized under this
17 subsection will be undertaken.

18 (3) BIOENERGY RESEARCH CENTERS.—

19 (A) ESTABLISHMENT OF CENTERS.—In
20 carrying out the subprogram under paragraph
21 (1), the Director shall establish or maintain at
22 least 3 bioenergy research centers to accelerate
23 basic biological research, development, dem-
24 onstration, and commercial application of bio-
25 mass-based liquid transportation fuels, bio-

1 energy, and biobased products that reduce
2 greenhouse gas emissions and are produced
3 from a variety of regionally diverse feedstocks.

4 (B) GEOGRAPHIC DISTRIBUTION.—The
5 Secretary shall ensure that the bioenergy re-
6 search centers under this paragraph are estab-
7 lished in geographically diverse locations.

8 (C) SELECTION AND DURATION.—

9 (i) IN GENERAL.—A center under this
10 paragraph shall be selected on a competi-
11 tive basis for a period of 5 years.

12 (ii) REAPPLICATION.—After the end
13 of the period described in clause (i), a
14 grantee may reapply for selection on a
15 competitive, merit-reviewed basis.

16 (4) ENABLING SYNTHETIC BIOLOGY PLAN.—

17 (A) IN GENERAL.—The Secretary, in con-
18 sultation with other relevant Federal agencies,
19 the academic community, research-based non-
20 profit entities, and the private sector, shall de-
21 velop a comprehensive plan for federally sup-
22 ported research and development activities that
23 will support the energy and environmental mis-
24 sions of the Department and accelerate the

1 growth of a competitive synthetic biology indus-
2 try in the United States.

3 (B) PLAN.—The plan developed under sub-
4 paragraph (A) shall assess the need to create a
5 database for synthetic biology information, the
6 need and process for developing standards for
7 biological parts, components and systems, and
8 the need for a federally funded facility that en-
9 ables the discovery, design, development, pro-
10 duction, and systematic use of parts, compo-
11 nents, and systems created through synthetic
12 biology.

13 (C) SUBMISSION TO CONGRESS.—The Sec-
14 retary shall transmit the plan developed under
15 subparagraph (A) to the Congress not later
16 than 9 months after the date of enactment of
17 this Act.

18 (5) COMPUTATIONAL BIOLOGY AND SYSTEMS
19 BIOLOGY KNOWLEDGEBASE.—As part of the subpro-
20 gram described in paragraph (1), the Director shall
21 carry out research in computational biology, acquire
22 or otherwise ensure the availability of hardware for
23 biology-specific computation, and establish and
24 maintain an open virtual database and information
25 management system to centrally integrate systems

1 biology data, analytical software, and computational
2 modeling tools that will allow data sharing and free
3 information exchange in the scientific community.

4 (6) REPEAL.—Section 977 of the Energy Policy
5 Act of 2005 (42 U.S.C. 16317) is repealed.

6 (e) CLIMATE AND ENVIRONMENTAL SCIENCES SUB-
7 PROGRAM.—

8 (1) IN GENERAL.—As part of the activities au-
9 thorized under subsection (a), the Director shall
10 carry out a subprogram of climate and environ-
11 mental science research, which shall include activi-
12 ties to—

13 (A) understand, observe, and model the re-
14 sponse of the Earth's atmosphere and bio-
15 sphere, including oceans, to increased green-
16 house gas emissions, and any associated
17 changes in climate;

18 (B) sequester, destroy, immobilize, or re-
19 move contaminants and carbon from subsurface
20 environments, including at facilities of the De-
21 partment; and

22 (C) develop potential mitigation and adap-
23 tation options for increased greenhouse gas
24 emissions and any associated changes in cli-
25 mate.

1 (2) SUBSURFACE BIOGEOCHEMISTRY RE-
2 SEARCH.—

3 (A) IN GENERAL.—As part of the subpro-
4 gram described in paragraph (1), the Director
5 shall carry out research to advance a funda-
6 mental understanding of coupled physical,
7 chemical, and biological processes for control-
8 ling the movement of sequestered carbon and
9 subsurface environmental contaminants, includ-
10 ing field observations of subsurface microorga-
11 nisms and field-scale subsurface research.

12 (B) COORDINATION.—

13 (i) DIRECTOR.—The Director shall
14 carry out activities under this paragraph in
15 accordance with priorities established by
16 the Department's Under Secretary for
17 Science to support and accelerate the de-
18 contamination of relevant facilities man-
19 aged by the Department.

20 (ii) UNDER SECRETARY FOR
21 SCIENCE.—The Department's Under Sec-
22 retary for Science shall ensure the coordi-
23 nation of the activities of the Department,
24 including activities under this paragraph,
25 to support and accelerate the decontamina-

1 tion of relevant facilities managed by the
2 Department.

3 (3) NEXT-GENERATION ECOSYSTEM-CLIMATE
4 EXPERIMENT.—

5 (A) IN GENERAL.—The Director, in col-
6 laboration with other relevant agencies who are
7 participants in the United States Global
8 Change Research Program, shall carry out the
9 selection and development of a next-generation
10 ecosystem-climate change experiment to under-
11 stand the impact and feedbacks of increased
12 temperature and elevated carbon levels on eco-
13 systems.

14 (B) REPORT.—Not later than 1 year after
15 the date of enactment of this Act, the Director
16 shall transmit to the Congress a report con-
17 taining—

18 (i) an identification of the location or
19 locations that have been selected for the
20 experiment described in subparagraph (A);

21 (ii) a description of the need for addi-
22 tional experiments; and

23 (iii) an associated research plan.

24 (4) AMERIFLUX NETWORK COORDINATION AND
25 RESEARCH.—As part of the subprogram described in

1 paragraph (1), the Director shall carry out research
2 and coordinate the AmeriFlux Network to directly
3 observe and understand the exchange of greenhouse
4 gases, water, and energy within terrestrial eco-
5 systems and the response of those systems to climate
6 change and other dynamic terrestrial landscape
7 changes. The Director, in collaboration with other
8 relevant Federal agencies, shall—

9 (A) identify opportunities to incorporate
10 innovative and emerging observation tech-
11 nologies and practices into the existing Net-
12 work;

13 (B) conduct research to determine the
14 need for increased greenhouse gas observation
15 facilities across North America to meet future
16 mitigation and adaptation needs of the United
17 States; and

18 (C) examine how the technologies and
19 practices described in subparagraph (A), and
20 increased coordination among scientific commu-
21 nities through the Network, have the potential
22 to help characterize baseline greenhouse gas
23 emission sources and sinks in the United States
24 and internationally.

1 (5) REGIONAL AND GLOBAL CLIMATE MOD-
2 ELING.—As part of the subprogram described in
3 paragraph (1), the Director, in collaboration with
4 the Office of Advanced Scientific Computing Re-
5 search described in section 106, shall carry out re-
6 search to develop, evaluate, and use high-resolution
7 regional and global climate and Earth models and
8 predictions to determine, and support efforts to re-
9 duce, the impacts of changing climate.

10 (6) INTEGRATED ASSESSMENT RESEARCH.—
11 The Director shall carry out research into options
12 for mitigation of and adaptation to climate change
13 through multiscale models of the entire climate sys-
14 tem. Such modeling shall include human processes
15 and greenhouse gas emissions, land use, and inter-
16 action among human and Earth systems.

17 (7) COORDINATION.—The Director shall coordi-
18 nate activities under this subsection with other Of-
19 fice of Science activities and with the United States
20 Global Change Research Program.

21 (d) USER FACILITIES AND ANCILLARY EQUIP-
22 MENT.—

23 (1) IN GENERAL.—The Director shall carry out
24 a program for the construction, operation, and main-
25 tenance of user facilities to support the program

1 under this section. As practicable, these facilities
2 shall serve the needs of the Department, industry,
3 the academic community, and other relevant entities.

4 (2) INCLUDED FUNCTIONS.—User facilities de-
5 scribed in paragraph (1) shall include facilities which
6 carry out—

7 (A) genome sequencing and analysis of
8 plants, microbes, and microbial communities
9 using high throughput tools, technologies, and
10 comparative analysis;

11 (B) molecular level research in biological
12 interactions, subsurface science, and the inter-
13 faces of natural and engineered materials; and

14 (C) measurement of cloud and aerosol
15 properties used for examining atmospheric pro-
16 cesses and evaluating climate model perform-
17 ance, including ground stations at various loca-
18 tions, mobile resources, and aerial vehicles.

19 **SEC. 106. ADVANCED SCIENTIFIC COMPUTING RESEARCH**
20 **PROGRAM.**

21 (a) IN GENERAL.—As part of the activities author-
22 ized under section 103, the Director shall carry out a re-
23 search, development, demonstration, and commercial ap-
24 plication program to advance computational and net-
25 working capabilities to analyze, model, simulate, and pre-

1 diet complex phenomena relevant to the development of
2 new energy technologies and the competitiveness of the
3 United States.

4 (b) COORDINATION.—

5 (1) DIRECTOR.—The Director shall carry out
6 activities under this section in accordance with prior-
7 ities established by the Department's Under Sec-
8 retary for Science to determine and meet the com-
9 putational and networking research and facility
10 needs of the Office of Science and all other relevant
11 energy technology programs within the Department.

12 (2) UNDER SECRETARY FOR SCIENCE.—The
13 Department's Under Secretary for Science shall en-
14 sure the coordination of the activities of the Depart-
15 ment, including activities under this section, to de-
16 termine and meet the computational and networking
17 research and facility needs of the Office of Science
18 and all other relevant energy technology programs
19 within the Department.

20 (c) REPORTS.—

21 (1) ADVANCED COMPUTING FOR ENERGY APPLI-
22 CATIONS.—Not later than one year after the date of
23 enactment of this Act, the Secretary shall transmit
24 to the Congress a plan to integrate and leverage the
25 expertise and capabilities of the program described

1 in subsection (a), as well as other relevant computa-
2 tional and networking research programs and re-
3 sources supported by the Federal Government, to
4 advance the missions of the Department's applied
5 energy and energy efficiency programs.

6 (2) EXASCALE COMPUTING.—At least 18
7 months prior to the initiation of construction or in-
8 stallation of any exascale-class computing facility,
9 the Secretary shall transmit a plan to the Congress
10 detailing the proposed facility's cost projections and
11 capabilities to significantly accelerate the develop-
12 ment of new energy technologies.

13 (d) APPLIED MATHEMATICS AND SOFTWARE DEVEL-
14 OPMENT FOR HIGH-END COMPUTING SYSTEMS.—The Di-
15 rector shall carry out activities to develop, test, maintain,
16 and support mathematics, models, and algorithms for
17 complex systems, as well as programming environments,
18 tools, languages, and operating systems for high-end com-
19 puting systems (as defined in section 2 of the Department
20 of Energy High-End Computing Revitalization Act of
21 2004 (15 U.S.C. 5541)).

22 (e) HIGH-END COMPUTING FACILITIES.—The Direc-
23 tor shall—

24 (1) provide for sustained access by the research
25 community in the United States to high-end com-

1 puting systems and to Leadership Systems (as de-
2 fined in section 2 of the Department of Energy
3 High-End Computing Revitalization Act of 2004 (15
4 U.S.C. 5541)), including provision of technical sup-
5 port for users of such systems; and

6 (2) conduct research and development on next-
7 generation computing architectures and platforms to
8 support the missions of the Department.

9 **SEC. 107. FUSION ENERGY RESEARCH PROGRAM.**

10 (a) PROGRAM.—As part of the activities authorized
11 under section 103, the Director shall carry out a fusion
12 energy sciences research and development program to ef-
13 fectively address the scientific and engineering challenges
14 to building a cost-competitive fusion power plant and a
15 competitive fusion power industry in the United States.

16 (b) ITER.—The Director shall coordinate and carry
17 out the responsibilities of the United States with respect
18 to the ITER international fusion project pursuant to the
19 Agreement on the Establishment of the ITER Inter-
20 national Fusion Energy Organization for the Joint Imple-
21 mentation of the ITER Project.

22 (c) IDENTIFICATION OF PRIORITIES.—Not later than
23 180 days after the date of enactment of this Act, the Sec-
24 retary shall transmit to the Congress a report on the De-
25 partment's proposed research and development activities

1 in magnetic fusion over the 10 years following the date
2 of enactment of this Act under four realistic budget sce-
3 narios. The report shall—

4 (1) identify priorities for initiation of facility
5 construction and facility decommissioning under
6 each of those scenarios;

7 (2) provide an assessment of the need for a fa-
8 cility or facilities that can examine and test potential
9 fusion materials; and

10 (3) provide an assessment of whether a single
11 new facility that substantially addresses magnetic
12 fusion, inertial fusion, and next generation fission
13 materials research needs is feasible, in conjunction
14 with the expected capabilities of facilities operational
15 as of the date of enactment of this Act.

16 (d) FUSION MATERIALS RESEARCH AND DEVELOP-
17 MENT.—The Director, in coordination with the Assistant
18 Secretary for Nuclear Energy of the Department, shall
19 carry out research and development activities to identify,
20 characterize, and create materials that can endure the
21 neutron, plasma, and heat fluxes expected in a commercial
22 fusion power plant.

23 (e) FUSION SIMULATION PROJECT.—In collaboration
24 with the Office of Science's Advanced Scientific Com-
25 puting Research program described in section 106, the Di-

1 rector shall carry out a computational project to advance
2 the capability of fusion researchers to accurately simulate
3 an entire fusion energy system.

4 (f) INERTIAL FUSION ENERGY RESEARCH AND
5 TECHNOLOGY DEVELOPMENT PROGRAM.—The Secretary
6 shall carry out a program of research and technology de-
7 velopment in inertial fusion for energy applications, in-
8 cluding ion beam and laser fusion.

9 **SEC. 108. HIGH ENERGY PHYSICS PROGRAM.**

10 (a) PROGRAM.—As part of the activities authorized
11 under section 103, the Director shall carry out a research
12 program on the elementary constituents of matter and en-
13 ergy and the nature of space and time.

14 (b) NEUTRINO RESEARCH.—As part of the program
15 described in subsection (a), the Director shall carry out
16 research activities on the nature of the neutrino, which
17 may—

18 (1) include collaborations with the National
19 Science Foundation on relevant projects; and

20 (2) utilize components of existing accelerator
21 facilities to produce neutrino beams of sufficient in-
22 tensity to explore research priorities identified by the
23 High Energy Physics Advisory Panel or the National
24 Academy of Sciences.

1 (c) DARK ENERGY AND DARK MATTER RE-
2 SEARCH.—As part of the program described in subsection
3 (a), the Director shall carry out research activities on the
4 nature of dark energy and dark matter. These activities
5 shall be consistent with research priorities identified by
6 the High Energy Physics Advisory Panel or the National
7 Academy of Sciences, and may include—

8 (1) the development of space-based and land-
9 based facilities and experiments; and

10 (2) collaborations with the National Aeronautics
11 and Space Administration, the National Science
12 Foundation, or international collaborations on rel-
13 evant research projects.

14 (d) ACCELERATOR RESEARCH AND DEVELOP-
15 MENT.—The Director shall carry out research and devel-
16 opment in advanced accelerator concepts and technologies
17 to reduce the necessary scope and cost for the next genera-
18 tion of particle accelerators.

19 (e) INTERNATIONAL COLLABORATION.—The Direc-
20 tor, as practicable and in coordination with other appro-
21 priate Federal agencies as necessary, shall maximize the
22 access of United States researchers to the most advanced
23 facilities and research capabilities in the world, including
24 the Large Hadron Collider.

1 **SEC. 109. NUCLEAR PHYSICS PROGRAM.**

2 (a) PROGRAM.—As part of the activities authorized
3 under section 103, the Director shall carry out a research
4 program, and support relevant facilities, to discover and
5 understand various forms of nuclear matter.

6 (b) FACILITY CONSTRUCTION AND UPGRADES.—
7 Consistent with the Office of Science's project manage-
8 ment practices, the Director shall carry out—

9 (1) an upgrade of the Continuous Electron
10 Beam Accelerator Facility to a 12 gigaelectronvolt
11 beam of electrons; and

12 (2) construction of the Facility for Rare Isotope
13 Beams.

14 (c) ISOTOPE DEVELOPMENT AND PRODUCTION FOR
15 RESEARCH APPLICATIONS.—The Director shall carry out
16 a program for the production of isotopes, including the
17 development of techniques to produce isotopes, that the
18 Secretary determines are needed for research or other pur-
19 poses. In making this determination, the Secretary shall
20 consider any relevant recommendations made by Federal
21 advisory committees, the National Academies, and inter-
22 agency working groups in which the Department partici-
23 pates.

1 **SEC. 110. SCIENCE LABORATORIES INFRASTRUCTURE PRO-**
2 **GRAM.**

3 (a) PROGRAM.—The Director shall carry out a pro-
4 gram to improve the safety, efficiency, and mission readi-
5 ness of infrastructure at Office of Science laboratories.
6 The program shall include projects to—

7 (1) renovate or replace space that does not
8 meet research needs;

9 (2) replace facilities that are no longer cost ef-
10 fective to renovate or operate;

11 (3) modernize utility systems to prevent failures
12 and ensure efficiency;

13 (4) remove excess facilities to allow safe and ef-
14 ficient operations; and

15 (5) construct modern facilities to conduct ad-
16 vanced research in controlled environmental condi-
17 tions.

18 (b) MINOR CONSTRUCTION PROJECTS.—

19 (1) AUTHORITY.—Using operation and mainte-
20 nance funds or facilities and infrastructure funds
21 authorized by law, the Secretary may carry out
22 minor construction projects with respect to labora-
23 tories administered by the Office of Science.

24 (2) ANNUAL REPORT.—The Secretary shall
25 submit to Congress on an annual basis a report on
26 each exercise of the authority under subsection (a)

1 during the preceding fiscal year. Each report shall
2 provide a brief description of each minor construc-
3 tion project covered by the report.

4 (3) COST VARIATION REPORTS.—If, at any time
5 during the construction of any minor construction
6 project, the estimated cost of the project is revised
7 and the revised cost of the project exceeds the minor
8 construction threshold, the Secretary shall imme-
9 diately submit to Congress a report explaining the
10 reasons for the cost variation.

11 (4) DEFINITIONS.—In this section—

12 (A) the term “minor construction project”
13 means any plant project not specifically author-
14 ized by law for which the approved total esti-
15 mated cost does not exceed the minor construc-
16 tion threshold; and

17 (B) the term “minor construction thresh-
18 old” means \$10,000,000, with such amount to
19 be adjusted by the Secretary in accordance with
20 the Engineering News-Record Construction
21 Cost Index, or an appropriate alternative index
22 as determined by the Secretary, once every five
23 years after the date of enactment of this Act.

24 (5) NONAPPLICABILITY.—Sections 4703 and
25 4704 of the Atomic Energy Defense Act (50 U.S.C.

1 2743 and 2744) shall not apply to laboratories ad-
2 ministered by the Office of Science.

3 **SEC. 111. AUTHORIZATION OF APPROPRIATIONS.**

4 There are authorized to be appropriated to the Sec-
5 retary for the activities of the Office of Science—

6 (1) \$6,221,000,000 for fiscal year 2011, of
7 which—

8 (A) \$2,020,000 shall be for Basic Energy
9 Sciences activities under section 104;

10 (B) \$700,000 shall be for Biological and
11 Environmental Research activities under section
12 105; and

13 (C) \$469,000 shall be for Advanced Sci-
14 entific Computing Research activities under sec-
15 tion 106;

16 (2) \$6,656,000,000 for fiscal year 2012, of
17 which—

18 (A) \$2,220,000 shall be for Basic Energy
19 Sciences activities under section 104;

20 (B) \$791,000 shall be for Biological and
21 Environmental Research activities under section
22 105; and

23 (C) \$515,000 shall be for Advanced Sci-
24 entific Computing Research activities under sec-
25 tion 106;

1 (3) \$7,122,000,000 for fiscal year 2013, of
2 which—

3 (A) \$2,440,000 shall be for Basic Energy
4 Sciences activities under section 104;

5 (B) \$894,000 shall be for Biological and
6 Environmental Research activities under section
7 105; and

8 (C) \$567,000 shall be for Advanced Sci-
9 entific Computing Research activities under sec-
10 tion 106;

11 (4) \$7,621,000,000 for fiscal year 2014, of
12 which—

13 (A) \$2,690,000 shall be for Basic Energy
14 Sciences activities under section 104;

15 (B) \$957,000 shall be for Biological and
16 Environmental Research activities under section
17 105; and

18 (C) \$624,000 shall be for Advanced Sci-
19 entific Computing Research activities under sec-
20 tion 106; and

21 (5) \$8,154,000,000 for fiscal year 2015, of
22 which—

23 (A) \$2,960,000 shall be for Basic Energy
24 Sciences activities under section 104;

1 (B) \$1,060,000 shall be for Biological and
2 Environmental Research activities under section
3 105; and

4 (C) \$686,000 shall be for Advanced Sci-
5 entific Computing Research activities under sec-
6 tion 106.

7 **TITLE II—ADVANCED RESEARCH**
8 **PROJECTS AGENCY-ENERGY**

9 **SEC. 201. SHORT TITLE.**

10 This title may be cited as the “ARPA-E Reauthoriza-
11 tion Act of 2010”.

12 **SEC. 202. ARPA-E AMENDMENTS.**

13 Section 5012 of the America COMPETES Act (42
14 U.S.C. 16538) is amended—

15 (1) in subsection (c)(2)—

16 (A) in subparagraph (A), by inserting
17 “and applied” after “advances in fundamental”;

18 (B) by striking “and” at the end of sub-
19 paragraph (B);

20 (C) by striking the period at the end of
21 subparagraph (C) and inserting “; and”; and

22 (D) by adding at the end the following new
23 subparagraph:

24 “(D) promoting the commercial application
25 of advanced energy technologies.”;

1 (2) in subsection (e)(3), by amending subpara-
2 graph (C) to read as follows:

3 “(C) research and development of ad-
4 vanced manufacturing process and technologies
5 for the domestic manufacturing of novel energy
6 technologies; and”;

7 (3) by redesignating subsections (f) through
8 (m) as subsections (g), (h), (i), (j), (l), (m), (n), and
9 (o), respectively;

10 (4) by inserting after subsection (e) the fol-
11 lowing new subsection:

12 “(f) AWARDS.—In carrying out this section, the Di-
13 rector shall initiate and execute awards in the form of
14 grants, contracts, cooperative agreements, cash prizes,
15 and other transactions.”;

16 (5) in subsection (g), as so redesignated by
17 paragraph (3) of this section—

18 (A) by redesignating paragraphs (1) and
19 (2) as paragraphs (2) and (3), respectively;

20 (B) by inserting before paragraph (2), as
21 so redesignated by subparagraph (A) of this
22 paragraph, the following new paragraph:

23 “(1) IN GENERAL.—The Director shall establish
24 and maintain within ARPA-E a staff, including legal
25 counsel, contracting personnel, and program direc-

1 tors, with sufficient qualifications and expertise to
2 enable ARPA-E to carry out its responsibilities
3 under this section separate and distinct from the op-
4 erations of the rest of the Department.”;

5 (C) in paragraph (2)(A), as so redesign-
6 nated by subparagraph (A) of this paragraph,
7 by striking “each of”;

8 (D) in paragraph (2)(B), as so redesign-
9 nated by subparagraph (A) of this paragraph—

10 (i) in clause (iv), by striking “, with
11 advice under subsection (j) as appro-
12 priate,”;

13 (ii) by redesignating clauses (v) and
14 (vi) as clauses (vi) and (viii), respectively;

15 (iii) by inserting after clause (iv) the
16 following new clause:

17 “(v) identifying innovative cost-shar-
18 ing arrangements for ARPA-E projects, in-
19 cluding through use of the authority under
20 section 988(b)(3) of the Energy Policy Act
21 of 2005 (42 U.S.C. 16352(b)(3));”;

22 (iv) in clause (vi), as so redesignated
23 by clause (ii) of this subparagraph, by
24 striking “; and” and inserting a semicolon;
25 and

1 (v) by inserting after clause (vi), as so
2 redesignated by clause (ii) of this subpara-
3 graph, the following new clause:

4 “(vii) identifying mechanisms for com-
5 mercial application of successful energy
6 technology development projects, including
7 through establishment of partnerships be-
8 tween awardees and commercial entities;
9 and”;

10 (E) in paragraph (2)(C), as so redesign-
11 ated by subparagraph (A) of this paragraph,
12 by inserting “up to” after “shall be”;

13 (F) in paragraph (3), as so redesignated
14 by subparagraph (A) of this paragraph, by
15 striking subparagraph (B) and redesignating
16 subparagraphs (C) and (D) as subparagraphs
17 (B) and (C), respectively;

18 (G) by striking “program managers” each
19 place it appears and inserting “program direc-
20 tors”;

21 (H) by striking “program manager” each
22 place it appears and inserting “program direc-
23 tor”; and

24 (I) by adding at the end the following new
25 paragraph:

1 “(4) FELLOWSHIPS.—The Director is author-
2 ized to select exceptional early-career and senior sci-
3 entific, legal, business, and technical personnel to
4 serve as fellows to work at ARPA-E for terms not
5 to exceed two years. Responsibilities of fellows may
6 include—

7 “(A) supporting program managers in pro-
8 gram creation, design, implementation, and
9 management;

10 “(B) exploring technical fields for future
11 ARPA-E program areas;

12 “(C) assisting the Director in the creation
13 of the strategic vision for ARPA-E referred to
14 in subsection (h)(2);

15 “(D) preparing energy technology and eco-
16 nomic analyses; and

17 “(E) any other appropriate responsibilities
18 identified by the Director.”;

19 (6) in subsection (h)(2), as so redesignated by
20 paragraph (3) of this section—

21 (A) by striking “2008” and inserting
22 “2010”; and

23 (B) by striking “2011” and inserting
24 “2013”;

1 (7) by amending subsection (j), as so redesignated by paragraph (3) of this section, to read as follows:

4 “(j) FEDERAL DEMONSTRATION OF TECHNOLOGIES.—The Director shall seek opportunities to partner with purchasing and procurement programs of Federal agencies to demonstrate energy technologies resulting from activities funded through ARPA-E.”;

9 (8) by inserting after such subsection (j) the following new subsection:

11 “(k) EVENTS.—The Director is authorized to convene, organize, and sponsor events that further the objectives of ARPA-E, including events that assemble awardees, the most promising applicants for ARPA-E funding, and a broad range of ARPA-E stakeholders (which may include members of relevant scientific research and academic communities, government officials, financial institutions, private investors, entrepreneurs, and other private entities), for the purposes of—

20 “(1) demonstrating projects of ARPA-E awardees;

22 “(2) demonstrating projects of finalists for ARPA-E awards and other energy technology projects;

1 “(3) facilitating discussion of the commercial
2 application of energy technologies developed under
3 ARPA-E and other government-sponsored research
4 and development programs; or

5 “(4) such other purposes as the Director con-
6 siderers appropriate.”;

7 (9) in subsection (m)(1), as so redesignated by
8 paragraph (3) of this section, by striking “4 years”
9 and inserting “6 years”;

10 (10) in section (m)(2)(B), as so redesignated by
11 paragraph (3) of this section, by inserting “, and
12 how those lessons may apply to the operation of
13 other programs within the Department of Energy”
14 after “ARPA-E”;

15 (11) by amending subsection (o)(2), as so re-
16 designated by paragraph (3) of this section, to read
17 as follows:

18 “(2) AUTHORIZATION OF APPROPRIATIONS.—
19 Subject to paragraph (4), there are authorized to be
20 appropriated to the Director for deposit in the
21 Fund, without fiscal year limitation—

22 “(A) \$300,000,000 for fiscal year 2011;

23 “(B) \$500,000,000 for fiscal year 2012;

24 “(C) \$700,000,000 for fiscal year 2013;

25 “(D) \$900,000,000 for fiscal year 2014;

1 “(E) \$1,000,000,000 for fiscal year 2015;
2 and
3 “(F) such sums as are necessary for each
4 of fiscal years 2016 through 2020.”; and
5 (12) in subsection (o), as so redesignated by
6 paragraph (3) of this section, by—
7 (A) striking paragraph (4); and
8 (B) redesignated paragraph (5) as para-
9 graph (4).

10 **TITLE III—ENERGY INNOVATION** 11 **HUBS**

12 **SEC. 301. SHORT TITLE.**

13 This title may be cited as the “Energy Innovation
14 Hubs Authorization Act of 2010”.

15 **SEC. 302. ENERGY INNOVATION HUBS.**

16 (a) ESTABLISHMENT OF PROGRAM.—

17 (1) IN GENERAL.—The Secretary of Energy
18 shall carry out a program to enhance the Nation’s
19 economic, environmental, and energy security by
20 making grants to consortia for establishing and op-
21 erating Energy Innovation Hubs to conduct and
22 support, whenever practicable at one centralized lo-
23 cation, multidisciplinary, collaborative research, de-
24 velopment, demonstration, and commercial applica-

1 tion of advanced energy technologies in areas not
2 being served by the private sector.

3 (2) TECHNOLOGY DEVELOPMENT FOCUS.—The
4 Secretary shall designate for each Hub a unique ad-
5 vanced energy technology development focus.

6 (3) COORDINATION.—The Secretary shall en-
7 sure the coordination of, and avoid unnecessary du-
8 plication of, the activities of Hubs with those of
9 other Department of Energy research entities, in-
10 cluding the National Laboratories, the Advanced Re-
11 search Projects Agency—Energy, and Energy Fron-
12 tier Research Centers, and within industry. Such co-
13 ordination shall include convening and consulting
14 with representatives of staff of the Department of
15 Energy, representatives from Hubs and the quali-
16 fying entities that are members of the consortia op-
17 erating the Hubs, and representatives of such other
18 entities as the Secretary considers appropriate, to
19 share research results, program plans, and opportu-
20 nities for collaboration.

21 (4) ADMINISTRATION.—The Secretary shall ad-
22 minister this section with respect to each Hub
23 through the Department program office appropriate
24 to administer the subject matter of the technology

1 development focus assigned under paragraph (2) for
2 the Hub.

3 (b) CONSORTIA.—

4 (1) ELIGIBILITY.—To be eligible to receive a
5 grant under this section for the establishment and
6 operation of a Hub, a consortium shall—

7 (A) be composed of no fewer than 2 quali-
8 fying entities;

9 (B) operate subject to a binding agreement
10 entered into by its members that documents—

11 (i) the proposed partnership agree-
12 ment, including the governance and man-
13 agement structure of the Hub;

14 (ii) measures to enable cost-effective
15 implementation of the program under this
16 section;

17 (iii) a proposed budget, including fi-
18 nancial contributions from non-Federal
19 sources;

20 (iv) conflict of interest procedures
21 consistent with subsection (d)(3), all
22 known material conflicts of interest, and
23 corresponding mitigation plans;

24 (v) an accounting structure that en-
25 ables the Secretary to ensure that the con-

1 consortium has complied with the require-
2 ments of this section; and

3 (vi) an external advisory committee
4 consistent with subsection (d)(2); and

5 (C) operate as a nonprofit organization.

6 (2) APPLICATION.—A consortium seeking to es-
7 tablish and operate a Hub under this section, acting
8 through a prime applicant, shall transmit to the Sec-
9 retary an application at such time, in such form,
10 and accompanied by such information as the Sec-
11 retary shall require, including a detailed description
12 of the elements of the consortium agreement re-
13 quired under paragraph (1)(B).

14 (c) SELECTION AND SCHEDULE.—The Secretary
15 shall select consortia for grants for the establishment and
16 operation of Hubs through competitive selection processes.
17 Grants made to a Hub shall be for a period not to exceed
18 5 years, after which the grant may be renewed, subject
19 to a competitive selection process.

20 (d) HUB OPERATIONS.—

21 (1) IN GENERAL.—Hubs shall conduct or pro-
22 vide for multidisciplinary, collaborative research, de-
23 velopment, demonstration, and commercial applica-
24 tion of advanced energy technologies within the tech-
25 nology development focus designated for the Hub by

1 the Secretary under subsection (a)(2). Each Hub
2 shall—

3 (A) encourage collaboration and commu-
4 nication among the member qualifying entities
5 of the consortium and awardees by conducting
6 activities whenever practicable at one central-
7 ized location;

8 (B) develop and publish on the Depart-
9 ment of Energy's website proposed plans and
10 programs;

11 (C) submit an annual report to the Sec-
12 retary summarizing the Hub's activities, includ-
13 ing detailing organizational expenditures, listing
14 external advisory committee members, and de-
15 scribing each project undertaken by the Hub;
16 and

17 (D) monitor project implementation and
18 coordination.

19 (2) EXTERNAL ADVISORY COMMITTEE.—Each
20 Hub shall establish an external advisory committee,
21 the membership of which shall have sufficient exper-
22 tise to advise and provide guidance on scientific,
23 technical, industry, financial, and research manage-
24 ment matters.

25 (3) CONFLICTS OF INTEREST.—

1 (A) PROCEDURES.—Hubs shall establish
2 conflict of interest procedures, consistent with
3 those of the Department of Energy, to ensure
4 that employees and consortia designees for Hub
5 activities who are in decisionmaking capacities
6 disclose all material conflicts of interest, includ-
7 ing financial, organizational, and personal con-
8 flicts of interest.

9 (B) DISQUALIFICATION AND REVOCATION.—The Secretary may disqualify an appli-
10 cation or revoke funds distributed to a Hub if
11 the Secretary discovers a failure to comply with
12 conflict of interest procedures established under
13 subparagraph (A).
14

15 (e) PROHIBITION ON CONSTRUCTION.—No funds
16 provided pursuant to this section may be used for con-
17 struction of new buildings or facilities for Hubs. Construc-
18 tion of new buildings or facilities shall not be considered
19 as part of the non-Federal share of a Hub cost-sharing
20 agreement.

21 (f) OVERSIGHT BOARD.—The Secretary shall estab-
22 lish and maintain within the Department an Oversight
23 Board to oversee the progress of Hubs.

24 (g) DEFINITIONS.—For purposes of this section:

1 (1) ADVANCED ENERGY TECHNOLOGY.—The
2 term “advanced energy technology” means an inno-
3 vative technology—

4 (A) that produces energy from solar, wind,
5 geothermal, biomass, tidal, wave, ocean, or
6 other renewable energy resources;

7 (B) that produces nuclear energy;

8 (C) for carbon capture and sequestration;

9 or

10 (D) that generates, transmits, distributes,
11 utilizes, or stores energy more efficiently than
12 conventional technologies.

13 (2) HUB.—The term “Hub” means an Energy
14 Innovation Hub established in accordance with this
15 section.

16 (3) INSTITUTION OF HIGHER EDUCATION.—The
17 term “institution of higher education” has the
18 meaning given that term in section 101(a) of the
19 Higher Education Act of 1965 (20 U.S.C. 1001(a)).

20 (4) QUALIFYING ENTITY.—The term “quali-
21 fying entity” means—

22 (A) an institution of higher education;

23 (B) an appropriate State or Federal entity;

24 (C) a nongovernmental organization with
25 expertise in advanced energy technology re-

1 search, development, demonstration, or com-
2 mercial application; or

3 (D) any other relevant entity the Secretary
4 considers appropriate.

5 (5) SECRETARY.—The term “Secretary” means
6 the Secretary of Energy.

7 (h) AUTHORIZATION OF APPROPRIATIONS.—There
8 are authorized to be appropriated to the Secretary to carry
9 out this section—

10 (1) \$110,000,000 for fiscal year 2011;

11 (2) \$135,000,000 for fiscal year 2012;

12 (3) \$195,000,000 for fiscal year 2013;

13 (4) \$210,000,000 for fiscal year 2014; and

14 (5) \$210,000,000 for fiscal year 2015.

SECTION-BY-SECTION ANALYSIS OF
DOE OFFICE OF SCIENCE AUTHORIZATION ACT OF 2010

Title I—Office of Science

Sec. 101: Short Title

Gives title of the bill as the “DOE Office of Science Authorization Act of 2010”

Sec. 102: Definitions

Provides definitions for “DEPARTMENT”, “DIRECTOR”, “OFFICE OF SCIENCE”, and “SECRETARY”

Sec. 103: Office of Science Activities

Directs the Secretary of Energy to carry out research, development, demonstration, and commercial application activities in science supporting the missions of the Department, including programs on basic energy sciences, biological and environmental research, advanced scientific computing research, fusion energy sciences, high energy physics, and nuclear physics.

Instructs the Department’s Under Secretary for Science to ensure the coordination with the other activities of the Department, and support joint activities among the Department’s programs.

Sec. 104: Basic Energy Sciences Program

Directs the Director of the Office of Science to carry out a program in basic energy sciences, including materials sciences and engineering, chemical sciences, biosciences, and geosciences, for the purpose of providing the scientific foundations for new energy technologies.

As part of this program, the Director is instructed to support:

- 1) construction and operation of the program’s major user facilities,
- 2) competitively awarded energy frontier research centers, and
- 3) relevant accelerator research and development activities, in coordination with the Office of Science’s High Energy Physics and Nuclear Physics programs.

Sec. 105: Biological and Environmental Research Program

Authorizes a program of research, development, demonstration, and commercial application in the areas of biological systems science and climate and environmental science.

The biological systems science research includes activities to:

- 1) establish a virtual systems biology information framework,
- 2) support research on computational biology,
- 3) continue the research of the bioenergy research centers, and expand them to include biobased products, and
- 4) direct the program to develop a synthetic biology plan.

The climate and environment science research includes activities to:

- 1) support the research and coordination of the ecosystem observation AmeriFlux Network,
- 2) develop a next-generation ecosystem-climate change experiment,
- 3) continue research in regional and global climate modeling, and
- 4) support integrated assessment research.

Sec. 106. Advanced Scientific Computing Research Program

Directs the Director to carry out a research, development, demonstration, and commercial application program to advance computational and networking capabilities to analyze, model, simulate, and predict complex phenomena relevant to the development of new energy technologies and the competitiveness of the United States.

Instructs the Secretary to produce a plan to integrate and leverage the expertise and capabilities of the program, as well as other relevant computational programs and resources supported by the Federal Government, to advance the missions of the Department’s applied energy and energy efficiency programs.

Instructs the Secretary to, at least 18 months prior to the initiation of construction or installation of any exascale-class computing facility, produce a plan detailing

the proposed facility's cost projections and capabilities to significantly accelerate the development of new energy technologies.

Authorizes research and development activities in applied mathematics, high-end computing software development, and next-generation computing architectures and platforms to support the missions of the Department.

Sec. 107. Fusion Energy Research Program

Directs the Director to carry out a fusion energy sciences research and development program on the scientific and engineering challenges to building a cost-competitive fusion power plant and a fusion power industry in the United States.

As part of this program, the Director is instructed to:

- 1) coordinate and carry out the responsibilities of the United States with respect to the ITER international fusion project,
- 2) produce a 10-year prioritization plan,
- 3) support fusion materials research and development activities in coordination with the Assistant Secretary for Nuclear Energy,
- 4) carry out a computational project to advance the capability of fusion researchers to accurately simulate an entire fusion energy system, in collaboration with the Advanced Scientific Computing Research program, and

In addition, the Secretary is instructed to establish a research and development program in inertial fusion for energy applications.

Sec. 108. High Energy Physics Program

Directs the Director to carry out a research program on the elementary constituents of matter and energy and the nature of space and time.

As part of this program, the Director is instructed to support research in the nature of the neutrino, dark energy, and dark matter.

The Director is also instructed to carry out research and development in advanced accelerator concepts and technologies to reduce the necessary scope and cost for the next generation of particle accelerators.

Sec. 109. Nuclear Physics Program

Directs the Director to carry out a research program, and support relevant facilities, to discover and understand various forms of nuclear matter.

Director is also instructed to carry out a program for the production of isotopes, including the development of techniques to produce isotopes, for research applications.

Sec. 110. Science Laboratories Infrastructure Program

Directs the Director to carry out a program to improve the safety, efficiency, and mission readiness of infrastructure at Office of Science laboratories.

Sets the minor construction threshold at Office of Science laboratories at \$10 million, to be adjusted by the Secretary in accordance with the Engineering News-Record Construction Cost Index, or an appropriate alternative index as determined by the Secretary, once every 5 years after the date of enactment of this Act.

Sec. 111. Authorization Of Appropriations

Authorizes to be appropriated to the Secretary of Energy for the activities of the Office of Science:

- (1) \$6,221,000,000 for fiscal year 2011
- (2) \$6,656,000,000 for fiscal year 2012
- (3) \$7,122,000,000 for fiscal year 2013
- (4) \$7,621,000,000 for fiscal year 2014
- (5) \$8,154,000,000 for fiscal year 2015.

Title II—Advanced Research Projects Agency-Energy

Sec. 201. Short Title

ARPA-E Reauthorization Act of 2010

Sec. 202. ARPA-E Amendments

Amends section 5012 of the America COMPETES Act of 2007 through the following:

(1) in GOALS

Adds provisions to clarify that ARPA-E will achieve its goals through both fundamental “and applied” science, and through “promoting the commercial application of advanced energy technologies”.

(2) in GOALS

Emphasizes that the R&D on manufacturing processes and technologies should be for the domestic manufacturing of novel energy technologies.

(3) Re-designates subsections (f) as (g), and reorders all subsections thereafter

(4) Inserts new subsection “(f) AWARDS” to clarify that the Director of ARPA-E has the authority to initiate and execute the full range of award instruments of the Department, including grants, contracts, cooperative agreements, cash prizes and other transactions. “Other Transactions Authority” is a special flexible contracting authority granted to the Department in Section 1007 of the Energy Policy Act (EPAcT) of 2005.

(5) in PERSONNEL

Inserts new paragraph (1) requiring the Director to maintain a staff of qualified and experienced legal counsel, contracting personnel, and program directors to serve solely within ARPA-E, thus further allowing ARPA-E to remain separate and distinct from the other programs within the Department.

Makes changes to clarify that program managers (program directors) can direct more than one program, and that program managers (program directors) are not required to seek the advice of advisory committees or scientific organizations in making award selections.

Adds to the list of responsibilities of the program manager (program director) identifying cost-sharing opportunities for projects, including through possible exercising of waiver authority by the Secretary under Section 988 of EPAcT 2005; and identifying ways to transfer successful energy technology development projects to the marketplace.

Clarifies that the term of a program manager (program director) may be “up to” 3 years.

Strikes requirement that ARPA-E have at least 70 and not less than 120 personnel.

Replaces term “program manager” with “program director” to align with current practices of ARPA-E.

Authorizes the Director to hire exceptional scientific, legal, business, and technical personnel to serve as Fellows.

(6) in REPORTS and ROADMAPS

Shifts deadlines for the Director to provide the Strategic Vision Roadmap from 2008 and 2011, to 2010 and 2013, respectively.

(7) in FEDERAL DEMONSTRATION OF TECHNOLOGIES

Strengthens existing language to require Director to actively seek opportunities to demonstrate ARPA-E technologies through procurement by DOE and other Federal agencies.

(8) Inserts new subsection “(k) EVENTS” authorizing the Director to convene events for the purposes of allowing ARPA-E project awardees and finalists to demonstrate technologies to a range of stakeholders, and for other purposes as determined by the Director.

(9) in ARPA-E EVALUATION

Changes from “4 years” to “6 years” the time after establishment at which the National Academies will evaluate the performance of ARPA-E.

(10) in ARPA-E EVALUATION

Adds a requirement that the lessons learned in the National Academies evaluation of ARPA-E shall consider how such lessons may apply to other programs within DOE.

(11) in FUNDING

Extends Authorization of Appropriations for Fiscal Years 2011 through 2015:

- (A) \$300,000,000 for fiscal year 2011
- (B) \$500,000,000 for fiscal year 2012
- (C) \$700,000,000 for fiscal year 2013
- (D) \$900,000,000 for fiscal year 2014
- (E) \$1,000,000,000 for fiscal year 2015

And such sums as are necessary for each of fiscal years 2016 through 2020.

Strikes Limitation which made fiscal year 2008 funding for ARPA-E contingent upon the Office of Science receiving an increase from 2007.

Title III—Energy Innovation Hubs

Sec. 301. Short Title

Energy Innovation Hubs Authorization Act of 2010

Sec. 302. Energy Innovation Hubs

(a) ESTABLISHMENT OF PROGRAM

Directs the Secretary to carry out a program to create Energy Innovation Hubs that will conduct and support research, development, demonstration and commercial application of advanced energy technologies. Where practicable these activities should occur in a central location. Each Hub created shall be focused on a particular unique advanced energy technology. The Secretary will ensure that the program is coordinated with other DOE research entities so as to avoid duplication and shall convene representatives from the Hubs, DOE, and any other relevant entities the Secretary find appropriate. The Secretary shall also administer each Hub through a DOE program with relevant jurisdiction based on a Hub's technology focus.

(b) CONSORTIA

Outlines the requirements that must be met by an applicant consortium in order to be eligible to form a Hub. A consortium must be made up of at least two qualifying entities who have created a binding agreement documenting the partnership agreement, measures to ensure cost-effective implementation, a proposed budget, conflict of interest procedures, an accounting structure, and an external advisory committee. The application made by the consortium to the Secretary will be made by one of the consortium's members as a prime applicant.

(c) SELECTION AND SCHEDULE

Establishes the process by which the Secretary shall review all consortium applications received. The Secretary shall review all Hub applications received, and consortia grants will be approved through a competitive process. Any grant made to a Hub shall be for a period no longer than 5 years and may be renewed through a competitive process.

(d) HUB OPERATIONS

Details how a Hub, once provided a grant by the Secretary, shall conduct multidisciplinary, collaborative research, development, demonstration, and commercial application of advanced energy technologies. A Hub shall encourage collaboration and communication and, whenever practicable, conduct its activities at one centralized location. In order to provide greater transparency, the Hub shall develop and publish on DOE's website all proposed plans and programs. In addition to a general duty to monitor project implementation and coordination, the Hub shall submit an annual report to the Secretary that summarizes all activities and projects, expenditures, and external advisory committee members.

The external advisory committee each Hub is required to establish under this section will act as an advisor to the Hub. The membership of each committee shall advise the Hub decision makers on Hub programs and planned activities, but shall not have decision making authority. The advisory committee membership should have sufficient expertise to provide guidance on scientific, technical, financial, and research management matters.

This section also requires each Hub to establish procedures to address conflicts of interest amongst any employees or consortia designees with decision making authority. These procedures should be consistent with those already established by DOE and should disclose any material conflicts of interest. In the event the Secretary discovers a failure to disclose any conflict of interest he may disqualify an application or revoke any funds granted to the Hub.

(e) PROHIBITION ON CONSTRUCTION

Prohibits any funds granted by the Secretary to a Hub to be used for construction of a new building or facility for Hub activities. Furthermore, construction of new buildings or facilities shall not be considered as part of the non-Federal share of a Hub cost-sharing agreement.

(f) OVERSIGHT BOARD

Requires the Secretary to establish within the Department an Oversight Board to monitor the Hubs and their activities.

(g) DEFINITIONS

Provides the definitions for terms used within the bill, including: Advanced Energy Technology, Hub, Institution of Higher Education, Qualifying Entity, and Secretary.

(h) AUTHORIZATION OF APPROPRIATIONS

Provides authorizations for each of the fiscal years 2011 through 2015 as follows:

- (1) \$110,000,000 for fiscal year 2011;

- (2) \$135,000,000 for fiscal year 2012;
 (3) \$195,000,000 for fiscal year 2013;
 (4) \$210,000,000 for fiscal year 2014; and
 (5) \$210,000,000 for fiscal year 2015.

**COMMITTEE ON SCIENCE AND TECHNOLOGY
 ENERGY AND ENVIRONMENT
 SUBCOMMITTEE MARKUP
 March 25, 2010**

AMENDMENT ROSTER

Committee Print – Department of Energy

No.	Sponsor	Description	Results
1	Mr. Baird (Manager's Amendment)	<p>Makes several technical and clarifying changes to the bill.</p> <p>Amends Section 103 ("Office of Science Activities") to instruct the Director to carry out construction, operation, and maintenance of user facilities to support the activities described in Section 103(a).</p> <p>Amends Section 104 ("Basic Energy Sciences Program") to instruct the Director to support construction of an upgrade of the Advanced Photon Source to improve brightness and performance.</p> <p>Amends and clarifies the selection and duration requirements relating to the Energy Frontier research Centers and Bioenergy Research Centers.</p> <p>Adds a new subsection to Section 106 ("Advanced Scientific Computing Research Program") stating that the program shall support certain research relevant to energy applications, including both basic and applied energy research programs carried out by the Secretary.</p> <p>Makes several changes to the fusion energy research language in Section 106 ("Fusion Energy Research Program")</p> <p>Makes corrections to the authorization amounts in Section 111 ("Authorization</p>	Agreed to by voice vote.

SECTION-BY-SECTION ANALYSIS

		of Appropriations).	
2	Mr. Ehlers (034)	Strikes Section 103(a) and replaces it with a new section detailing the mission and duties of the Office of Science.	Agreed to by voice vote.
3	Mr. Ehlers (033)	Amends Energy Frontier Research Centers language in Section 104 (“Basic Energy Sciences Program”) to state that the Director shall carry out a grant program to provide awards “to conduct fundamental and use-inspired energy research to accelerate scientific breakthroughs related to needs identified” in certain reports.	Agreed to by voice vote.
4	Mr. Lipinski (058)	Clarifies that the Director shall provide for sustained access by the “public and private” research community in the U.S. to high-end computing systems and Leadership Systems. Directs the Director to conduct outreach to increase the use of high-performance computer modeling and simulation capabilities by industry, including manufacturers.	Agreed to by voice vote.
5	Mr. Garamendi	Amends Section 107 (“Fusion Energy Research Program”) to require that, after the release of a National Academies report on fusion energy research, the Secretary submit a plan to Congress describing the Department’s plan to incorporate any relevant recommendations from that report.	Agreed to by voice vote.
6	Mr. Lipinski (057)	Amends the annual reporting requirements for the Science Laboratories infrastructure program.	Agreed to by voice vote.
7	Mr. Ehlers (035)	Amendment to Section 111 (“Authorization of Appropriations”) strikes the authorization levels specified for Basic Energy Sciences activities, Biological and Environmental Research activities, and Advanced Scientific Computing Research activities for each of the fiscal years 2011 through 2015.	Defeated by Roll Call Vote: Y-6 N-12
8	Mrs. Biggert	Amendment to Section 111 (“Authorization of Appropriations”) lowers the authorization levels for each	Offered and withdrawn.

		of the fiscal years 2011 through 2015.	
9	Mr. Diaz-Balart	Amends all Titles of the Committee Print by striking the authorization of appropriations for fiscal years 2014 and 2015.	Defeated by voice vote.
10	Mr. Bartlett	Amendment to Section 202 (“ARPA-E Amendments”) requires the ARPA-E Director to ensure that “at least 30 percent of applicants who are selected are a small business or partner with a small business.”	Offered and withdrawn.
11	Mr. Luján	Amendment to Section 202 (“ARPA-E Amendments”) increases from “2.5 percent” to “5 percent” the amount of appropriated funds that shall be used for technology transfer and outreach activities.	Agreed to by voice vote.
12	Mr. Inglis	Adds a new section limiting to \$300,000,000, the amount that may be appropriated to ARPA-E for any fiscal year unless the amount appropriated for that year to the Office of Science exceeds the amount appropriated for the previous fiscal year, adjusted for inflation.	Defeated by voice vote.
13	Ms. Johnson	Amends Section 302 (“Energy Innovation Hubs”) to require that for at least 3 awards to consortia under the section, the Secretary shall give special considerations to applications in which 1 or more of the institutions are 1890 Land Grant Institutions, Predominantly Black Institutions, Tribal Colleges or Universities, or Hispanic Serving Institutions.	Offered and withdrawn.

**AMENDMENT TO THE COMMITTEE PRINT
OFFERED BY MR. BAIRD OF WASHINGTON**

Page 2, lines 8 and 12, redesignate subsections (c) and (d) as subsections (d) and (e), respectively.

Page 2, after line 7, insert the following new subsection:

1 (c) USER FACILITIES.—The Director shall carry out
2 the construction, operation, and maintenance of user fa-
3 cilities to support the activities described in subsection (a).
4 As practicable, these facilities shall serve the needs of the
5 Department, industry, the academic community, and other
6 relevant entities for the purposes of advancing the mis-
7 sions of the Department.

Page 2, line 24, insert “BASIC ENERGY SCIENCES” before “USER FACILITIES”.

Page 3, line 12, strike “high-intensity” and insert “x-ray”.

Page 3, line 14, strike “characterization” and insert “microcharacterization”.

Page 3, line 15, strike “and”.

Page 3, line 16, strike the period and insert “; and”.

Page 3, after line 16, insert the following new subparagraph:

- 1 (E) other facilities the Director considers
2 appropriate, consistent with section 103(c).

Page 3, line 22, strike “and”.

Page 3, line 24, strike the period and insert “; and”.

Page 3, after line 24, insert the following new subparagraph:

- 3 (C) an upgrade of the Advanced Photon
4 Source to improve brightness and performance.

Page 4, lines 10 and 13, redesignate subparagraphs (B) and (C) as subparagraphs (C) and (D), respectively.

Page 4, after line 9, insert the following new subparagraph:

- 5 (B) the Basic Energy Sciences Basic Re-
6 search Needs workshop reports;

Page 4, lines 18 through 22, amend paragraph (3) to read as follows:

- 7 (3) SELECTION AND DURATION.—
8 (A) IN GENERAL.—A collaboration under
9 this subsection shall be selected for a period of
10 5 years.

1 (B) REAPPLICATION.—After the end of the
2 period described in subparagraph (A), a grantee
3 may reapply for selection for a second period of
4 5 years on a competitive, merit-reviewed basis.

Page 5, lines 14 and 15, strike “biological, climate, and environmental systems” and insert “biological systems science and climate and environmental”.

Page 6, line 1, strike “increase” and insert “accelerate breakthroughs and new knowledge that will enable”.

Page 6, line 5, strike “remove” and insert “improve understanding of the global carbon cycle, including processes for removing”.

Page 6, line 9, insert “understand the biological mechanisms used to” before “destroy,”.

Page 6, line 14, strike “2 years” and insert “3 years”.

Page 6, line 19, strike “ESTABLISHMENT OF CENTERS” and insert “IN GENERAL”.

Page 6, lines 21 and 22, strike “establish or maintain at least 3” and insert “support at least 3”.

Page 7, line 5, strike “Secretary” and insert “Director”.

Page 7, lines 8 through 15, amend subparagraph (C) to read as follows:

1 (C) SELECTION AND DURATION.—A center
2 established under subparagraph (A) shall be se-
3 lected on a competitive, merit-reviewed basis for
4 a period of 5 years beginning on the date of es-
5 tablishment of that center. A center already in
6 existence on the date of enactment of this Act
7 may continue to receive support for a period of
8 5 years beginning on the date of establishment
9 of that center.

Page 8, line 12, insert “The plan shall describe the role of the Federal Government in meeting these needs.” after “synthetic biology.”

Page 11, line 6, strike “who” and insert “that”.

Page 15, line after line 19, insert the following new subsection (and redesignate the subsequent subsections accordingly):

10 (c) RESEARCH TO SUPPORT ENERGY APPLICA-
11 TIONS.—As part of the activities authorized under sub-
12 section (a), the program shall support research in high-

1 performance computing and networking relevant to energy
2 applications, including both basic and applied energy re-
3 search programs carried out by the Secretary.

Page 16, line 15, strike “maintain.”.

Page 17, line 15, insert “As part of this program,
the Director shall carry out research activities to expand
the fundamental understanding of plasmas and matter at
very high temperatures and densities.” after “the United
States.”.

Page 17, line 23, strike “180 days” and insert “1
year”.

Page 18, lines 7 through 15, strike paragraphs (2)
and (3).

Page 18, line 4, redesignate paragraph (1) as para-
graph (2).

Page 18, after line 3, insert the following new para-
graph:

4 (1) identify specific areas of fusion energy de-
5 velopment in which the United States can and
6 should establish or solidify a lead in the global fu-
7 sion energy development effort; and

Page 18, line 6, strike the semicolon and insert a period.

Page 18, line 22, after “power plant.” insert “As part of the activities authorized under subsection (c), the Secretary shall—

- 1 (1) provide an assessment of the need for a fa-
- 2 cility or facilities that can examine and test potential
- 3 fusion and next generation fission materials; and
- 4 (2) provide an assessment of whether a single
- 5 new facility that substantially addresses magnetic
- 6 fusion, inertial fusion, and next generation fission
- 7 materials research needs is feasible, in conjunction
- 8 with the expected capabilities of facilities operational
- 9 as of the date of enactment of this Act.”

Page 19, line 5, strike “TECHNOLOGY”.

Page 19, line 16, insert “rare decay processes and” after “research activities on”.

Page 20, line 22, insert “accelerator” after “the most advanced”.

Page 22, line 25, strike “on an annual basis” and insert “, as part of the annual budget submission of the Department,”.

Page 24, line 8, strike "\$2,020,000" and insert "\$2,020,000,000".

Page 24, line 10, strike "\$700,000" and insert "\$700,000,000".

Page 24, line 13, strike "\$469,000" and insert "\$469,000,000".

Page 24, line 18, strike "\$2,220,000" and insert "\$2,220,000,000".

Page 24, line 20, strike "\$791,000" and insert "\$791,000,000".

Page 24, line 23, strike "\$515,000" and insert "\$515,000,000".

Page 25, line 3, strike "\$2,440,000" and insert "\$2,440,000,000".

Page 25, line 5, strike "\$894,000" and insert "\$894,000,000".

Page 25, line 8, strike "\$567,000" and insert "\$567,000,000".

Page 25, line 13, strike "\$2,690,000" and insert "\$2,690,000,000".

Page 25, line 15, strike "\$957,000" and insert "\$957,000,000".

Page 25, line 18, strike "\$624,000" and insert "\$624,000,000".

Page 25, line 23, strike "\$2,960,000" and insert "\$2,960,000,000".

Page 26, line 1, strike "\$1,060,000" and insert "\$1,060,000,000".

Page 26, line 4, strike "\$686,000" and insert "\$686,000,000".



**AMENDMENT TO THE COMMITTEE PRINT
OFFERED BY MR. EHLERS OF MICHIGAN**

Page 2, lines 4, 8, and 12, redesignate subsections (b) through (d) as subsections (c) through (e), respectively.

Strike page 1, line 16, through page 2, line 3, and insert the following:

1 **SEC. 103. MISSION OF THE OFFICE OF SCIENCE.**

2 (a) MISSION.—The mission of the Office of Science
3 shall be the delivery of scientific discoveries and major sci-
4 entific tools to transform the understanding of nature and
5 to advance the energy, economic, and national security of
6 the United States.

7 (b) DUTIES.—In support of this mission, the Sec-
8 retary shall carry out, through the Office of Science, pro-
9 grams on basic energy sciences, biological and environ-
10 mental research, advanced scientific computing research,
11 fusion energy sciences, high energy physics, and nuclear
12 physics through activities focused on—

13 (1) Science for Discovery to unravel nature's
14 mysteries through the study of subatomic particles,
15 atoms, and molecules that make of the materials of

1 our everyday world to DNA, proteins, cells, and en-
2 tire biological systems;

3 (2) Science for National Need by—

4 (A) advancing a clean energy agenda
5 through basic research on energy production,
6 storage, transmission, and use; and

7 (B) advancing our understanding of the
8 Earth's climate through basic research in at-
9 mospheric and environmental sciences and cli-
10 mate change; and

11 (3) National Scientific User Facilities to deliver
12 the 21st century tools of science, engineering, and
13 technology and provide the Nation's researchers with
14 the most advanced tools of modern science including
15 accelerators, colliders, supercomputers, light sources
16 and neutron sources, and facilities for studying the
17 nanoworld.



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**AMENDMENT TO THE COMMITTEE PRINT
OFFERED BY MR. EHLERS OF MICHIGAN**

Page 4, lines 4 through 6, strike “to meet energy research, development, demonstration, and commercial application needs identified in” and insert “to conduct fundamental and use-inspired energy research to accelerate scientific breakthroughs related to needs identified in”.



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**AMENDMENT TO THE COMMITTEE PRINT
OFFERED BY MR. LIPINSKI OF ILLINOIS**

Page 16, line 24, insert “public and private” after
“access by the”.

Page 17, after line 8, insert the following new sub-
section:

1 (f) OUTREACH.—The Director shall conduct outreach
2 programs and may form partnerships to increase the use
3 of and access to high-performance computing modeling
4 and simulation capabilities by industry, including manu-
5 facturers.



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**AMENDMENT TO THE COMMITTEE PRINT
OFFERED BY MR. GARAMENDI OF CALIFORNIA**

Page 19, line 8, insert “Not later than 180 days after the release of a report from the National Academies on inertial fusion energy research, the Secretary shall transmit to Congress a report describing the Department’s plan to incorporate any relevant recommendations from the National Academies’ report into this program.” after “and laser fusion.”.



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**AMENDMENT TO THE COMMITTEE PRINT
OFFERED BY MR. LIPINSKI OF ILLINOIS**

Page 23, line 1, insert “Each report shall include a summary of maintenance and infrastructure needs and associated funding requirements at each of the laboratories, including the amount of both planned and deferred infrastructure spending at each laboratory.” after “preceding fiscal year.”.



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**AMENDMENT TO THE COMMITTEE PRINT
OFFERED BY MR. EHLERS OF MICHIGAN**

Page 24, lines 6 through 15, strike “, of which” and all that follows through “section 106”.

Page 24, lines 16 through 25, strike “, of which” and all that follows through “section 106”.

Page 25, lines 1 through 10, strike “, of which” and all that follows through “section 106”.

Page 25, lines 11 through 20, strike “, of which” and all that follows through “section 106”.

Page 25, line 21, through page 26, line 6, strike “, of which” and all that follows through “section 106”.



**AMENDMENT TO THE COMMITTEE PRINT
OFFERED BY MRS. BIGGERT OF ILLINOIS**

Page 24, line 6, through page 26, line 6, amend paragraphs (1) through (5) to read as follows:

1 (1) \$5,221,000,000 for fiscal year 2011, of
2 which—

3 (A) \$1,871,000,000 shall be for Basic En-
4 ergy Sciences activities under section 104;

5 (B) \$639,000,000 shall be for Biological
6 and Environmental Research activities under
7 section 105; and

8 (C) \$434,000,000 shall be for Advanced
9 Scientific Computing Research activities under
10 section 106;

11 (2) \$5,800,000,000 for fiscal year 2012, of
12 which—

13 (A) \$2,078,000,000 shall be for Basic En-
14 ergy Sciences activities under section 104;

15 (B) \$710,000,000 shall be for Biological
16 and Environmental Research activities under
17 section 105; and

1 (C) \$482,000,000 shall be for Advanced
2 Scientific Computing Research activities under
3 section 106;

4 (3) \$6,205,000,000 for fiscal year 2013, of
5 which—

6 (A) \$2,223,000,000 shall be for Basic En-
7 ergy Sciences activities under section 104;

8 (B) \$759,000,000 shall be for Biological
9 and Environmental Research activities under
10 section 105; and

11 (C) \$516,000,000 shall be for Advanced
12 Scientific Computing Research activities under
13 section 106;

14 (4) \$6,640,000,000 for fiscal year 2014, of
15 which—

16 (A) \$2,379,000,000 shall be for Basic En-
17 ergy Sciences activities under section 104;

18 (B) \$812,000,000 shall be for Biological
19 and Environmental Research activities under
20 section 105; and

21 (C) \$552,000,000 shall be for Advanced
22 Scientific Computing Research activities under
23 section 106; and

24 (5) \$7,100,000,000 for fiscal year 2015, of
25 which—

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3

1 (A) \$2,544,000,000 shall be for Basic En-
2 ergy Sciences activities under section 104;

3 (B) \$869,000,000 shall be for Biological
4 and Environmental Research activities under
5 section 105; and

6 (C) \$590,000,000 shall be for Advanced
7 Scientific Computing Research activities under
8 section 106.



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**AMENDMENT TO THE COMMITTEE PRINT
OFFERED BY MR. MARIO DIAZ-BALART OF
FLORIDA**

In sections 111, 202, and 302, strike all authorization of appropriations provisions for fiscal years after fiscal year 2013.



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**AMENDMENT TO THE COMMITTEE PRINT
OFFERED BY MR. BARTLETT OF MARYLAND**

Page 28, line 12, by inserting before the semicolon the following: “and inserting ‘, ensuring that at least 30 percent of the applicants who are selected are a small business or partner with a small business.’”



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**AMENDMENT TO THE COMMITTEE PRINT
OFFERED BY MR. LUJÁN OF NEW MEXICO**

Page 33, line 4, strike “and”.

Page 33, line 9, strike the period and insert “; and”.

Page 33, after line 9, insert the following new paragraph:

1 (13) in subsection (o)(4)(B), as so redesignated
2 by paragraphs (3) and (12)(B) of this subsection—
3 (A) by striking “2.5 percent” and inserting
4 “5 percent”; and
5 (B) by inserting “, consistent with the goal
6 described in subsection (c)(2)(D) and within the
7 responsibilities of program directors as specified
8 in subsection (g)(2)(B)(vii)” after “outreach ac-
9 tivities”.



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**AMENDMENT TO THE COMMITTEE PRINT
OFFERED BY MR. INGLIS OF SOUTH CAROLINA**

Page 33, after line 9, add the following new section:

1 **SEC. 203. LIMITATION.**

2 No more than \$300,000,000 may be appropriated for
3 ARPA-E for any fiscal year unless the amount appro-
4 priated for that year for the activities of the Office of
5 Science of the Department of Energy exceeds the amount
6 appropriated for the previous fiscal year, as adjusted for
7 inflation in accordance with the Consumer Price Index
8 published by the Bureau of Labor Statistics.



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**AMENDMENT TO THE COMMITTEE PRINT
OFFERED BY MS. EDDIE BERNICE JOHNSON OF
TEXAS**

Page 38, after line 23, insert the following new subsection (and redesignate the subsequent subsections accordingly):

1 (g) SPECIAL CONSIDERATION.—For at least 3
2 awards to consortia under this section, the Secretary shall
3 give special consideration to applications in which 1 or
4 more of the institutions under subsection (b)(1)(A) are
5 1890 Land Grant Institutions (as defined in section 2 of
6 the Agricultural Research, Extension, and Education Re-
7 form Act of 1998 (7 U.S.C. 7061)), Predominantly Black
8 Institutions (as defined in section 318 of the Higher Edu-
9 cation Act of 1965 (20 U.S.C. 1059e)), Tribal Colleges
10 or Universities (as defined in section 316(b) of the Higher
11 Education Act of 1965 (20 U.S.C. 1059c(b)), or Hispanic
12 Serving Institutions (as defined in section 318 of the
13 Higher Education Act of 1965 (20 U.S.C. 1059e)).



PROCEEDINGS OF THE MARKUP BY THE SUBCOMMITTEE ON RESEARCH AND SCIENCE EDUCATION ON COMMITTEE PRINT, THE NATIONAL SCIENCE FOUNDATION AUTHORIZATION ACT OF 2010

WEDNESDAY, APRIL 14, 2010

HOUSE OF REPRESENTATIVES,
SUBCOMMITTEE ON RESEARCH AND SCIENCE EDUCATION,
COMMITTEE ON SCIENCE AND TECHNOLOGY,
Washington, DC.

The Subcommittee met, pursuant to call, at 10:09 a.m., in Room 2318 of the Rayburn House Office Building, Hon. Daniel Lipinski [Chairman of the Subcommittee] presiding.

Chairman LIPINSKI. The Subcommittee will come to order.

Pursuant to notice, the Subcommittee on Research and Science Education meets to consider the following measure: Committee Print of the *National Science Foundation Authorization Act of 2010*. I recognize myself for an opening statement.

This morning the Research and Science Education Subcommittee will consider the Committee Print of the *National Science Foundation Authorization Act of 2010*. Today's legislation will become an essential component of the reauthorization of the *America COMPETES Act*, which will be considered by the Full Committee later this month.

The Subcommittee has held a series of hearings on topics ranging from the state of STEM education at all levels, to the need to promote high-risk, high-reward research, to ensuring a sustainable research infrastructure. In addition to our Subcommittee hearings, I have also held a number of listening sessions across the country to gain insights from those on the frontline of research facilitated by the NSF. The result of the listening sessions and the Subcommittee hearings is a bill that will accelerate the growth of scientific knowledge, promote knowledge transfer and innovation, build a 21st century STEM workforce, and spur economic development.

The NSF was established 60 years ago, growing out of wartime research efforts and Vannevar Bush's conviction that "new products, new industries, and more jobs require continuous additions to knowledge of the laws of nature, and the application of that knowledge to practical purposes." And this has worked. Since World War II, 50 percent of U.S. GDP growth has come from the development and adoption of new technologies, along with countless improvements in medicine and national security.

As a former assistant professor at a research university, I have a special appreciation for the NSF. In graduate school I received an NSF Dissertation Improvement Grant. Throughout my time in academe, I became very familiar with the critical role that the Foundation plays. When I was elected to Congress, I immediately requested a seat on this committee, partly because of the NSF.

When I had the opportunity to chair this subcommittee at the beginning of this Congress, I jumped at the chance because I knew the NSF reauthorization was on the agenda.

While many agencies fund R&D, the NSF is unique in that supporting fundamental research and education in STEM disciplines is its only mission. Today's legislation authorizes \$47.5 billion for NSF over the next five years, keeping the agency on a doubling path, as recommended in the National Academies' *Rising Above the Gathering Storm* report and set in motion in the 2007 *America COMPETES Act*. While the one-time investment NSF received through the Recovery Act helped keep the scientific enterprise thriving and the brightest young people in the STEM pipeline, sustained growth at NSF is necessary to maintain gains and to ensure U.S. competitiveness.

NSF's mission extends beyond promoting the best science, and the agency reviews grants not only on the basis of intellectual merit, but also on the broader impact of the activities proposed. Over 10 years ago, the NSF began to require that researchers include activities such as education and public outreach to broaden the impact of their research. Unfortunately, this requirement has had uneven success. This legislation addresses this issue by requiring NSF to standardize its policies for broader impacts, requiring that proposed activities be based on proven strategies, and encouraging institutions of higher education and other education and research organizations to assist their researchers in meeting the broader impacts criterion.

The core of the NSF is innovation, and my legislation promotes it in a number of ways. First, it directs the NSF to spend at least five percent of its research budget on high-risk, high-reward proposals that have the potential to transform our understanding of science and engineering and create new frontiers. This is consistent with what we learned in our hearing on this subject last year, with recommendations in the National Academies' *Rising Above the Gathering Storm* report, and with the 2008 American Academy of Arts and Sciences *ARISE* report.

Next, this bill will advance manufacturing in the United States through investments in fundamental research in manufacturing technologies, materials and processes. Finally, it will help build stronger university-industry partnerships and ensure that researchers at institutions of all sizes and types understand how to engage successfully in knowledge transfer and innovation.

But an innovation economy needs both ideas and a talented STEM workforce. This legislation promotes the development of all of the STEM talent our Nation has to offer by increasing the collaboration and coordination of NSF-funded education projects and by supporting early career researchers through postdoctoral fellowships. The bill also supports the equipment and infrastructure these researchers need to succeed, an issue raised continually by researchers and their academic institutions. The legislation addresses concerns about how the NSF supports mid-scale research instrumentation, and encourages the NSF to make sure that its investment in infrastructure, including cyberinfrastructure, instrumentation and interdisciplinary centers, grows along with the overall budget.

Having worked on this bill for many months, I believe we have produced legislation that we can all be proud of and that will help produce a significant boost that will be felt not only in American research labs and American classrooms, but also in American homes as innovation and education produce jobs.

I want to thank my colleagues, including Mr. Mitchell, who have worked on and written pieces of this legislation, as well as both the Democratic and Republican Committee staffers who have spent many hours working together to improve and refine the bill. Finally, I want to thank Members for their participation this morning and I look forward to a productive hearing.

[The prepared statement of Chairman Lipinski follows:]

PREPARED STATEMENT OF CHAIRMAN DANIEL LIPINSKI

This morning the Research and Science Education Subcommittee will consider the Committee Print of the National Science Foundation Authorization Act of 2010. Today's legislation will become an essential component of the reauthorization of the America COMPETES Act, which will be considered by the full Committee later this month.

The Subcommittee has held a series of hearings on topics ranging from the state of STEM education at all levels to the need to promote high-risk/high-reward research, to ensuring a sustainable research infrastructure. In addition to our Subcommittee hearings, I've also held a number of listening sessions across the country to gain insights from those on the frontline of research facilitated by the NSF. The result of the listening sessions and the Subcommittee hearings is a bill that will accelerate the growth of scientific knowledge, promote knowledge transfer and innovation, build a 21st century STEM workforce, and spur economic development. The NSF was established 60 years ago, growing out of wartime research efforts and Vannevar Bush's conviction that "New products, new industries, and more jobs require continuous additions to knowledge of the laws of nature, and the application of that knowledge to practical purposes." And it has worked. Since World War II, 50% of U.S. GDP growth has come from the development and adoption of new technologies, along with countless improvements in medicine and national security.

As a former assistant professor at a research university, I have a special appreciation for the NSF. In graduate school I received an NSF Dissertation Improvement Grant. Throughout my time in academia, I became very familiar with the critical role that the Foundation plays. When I was elected to Congress, I immediately requested a seat on this committee, partly because of the NSF. When I had the opportunity to chair this subcommittee at the beginning of this Congress I jumped at the chance because I knew the NSF reauthorization was on the agenda.

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the National Academies' *Rising Above the Gathering Storm* report, and with the 2008 American Academy of Arts and Sciences *ARISE* report.

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Having worked on this bill for many months, I believe that we have produced legislation that we can be proud of and that will help produce a significant boost that will be felt not only in American research labs and American classrooms, but also in American homes as innovation and education produce jobs.

I want to thank thy colleagues, including Mr. Mitchell, who have worked on and written pieces of this legislation, as well as both, the Democratic and Republican committee staffers who have spent many hours working together to improve and refine the bill. Finally, I want to thank Members for their participation this morning and I look forward to a productive markup.

Chairman LIPINSKI. With that, I will turn it over to my colleague from Michigan, Dr. Ehlers, for his opening statement.

Mr. EHLERS. Thank you, Mr. Chairman, and I second your comments about the way in which our staff and your staff has worked together on this bill. It is an extremely important bill, and they have worked well together and the end result will be improved as a result.

I have been pleased to participate in the Research and Science Education Subcommittee's markup and the hearings on the reauthorization of the National Science Foundation. This Committee Print will be an important piece of the reauthorization of the America COMPETES, and I have done something which is rarely done in these committees, although probably much more often occurs in Science Committee than any other committee, but I have read every word of the bill, and that indicates the importance of the issue and the attention that it needs.

It is challenging to find large areas at the Foundation in need of great improvement. This is not because the agency is not operating well. This is an agency known for its responsible budgeting and respected for its merit review and evaluation processes. But overall I believe the bill we are considering today will further strengthen the National Science Foundation and also will improve our Nation's ability to compete globally, an issue that is receiving considerable attention.

However, I have a few reservations about some of the provisions we are considering today. Many of my colleagues are concerned that the authorized levels of funding for the National Science Foundation may be excessively high in light of our current economic situation, as well as the recent infusion of funds from the *American Recovery and Reinvestment Act*. In particular, some of my colleagues believe that infusion of funds eliminates the need for an increase at this point. You and I both know that is not correct.

I think that we can all agree that the NSF will function most effectively if we continue it on a strong doubling path that is also sustainable and that path was set forth in the *America COMPETES Act* and in subsequent actions, both in the Administration and in the Congress. I am hopeful that all of us can work together to find common ground on this issue and others that may raise questions about the appropriate roles and responsibilities of the NSF.

As I said before, I want to recognize and thank the majority staff for working closely with the minority staff on many of the provisions included in the Committee Print, as well as incorporating a variety of expertise from the NSF stakeholder community. I look forward to our continued collaborations as we improve and refine the Committee Print before us today, and I thank you for the good atmosphere that you have maintained in this subcommittee, Mr. Chairman, and the way we have worked together for the good of the institution as well as the good of the research effort in America.

With that, I yield back.

[The prepared statement of Mr. Ehlers follows:]

PREPARED STATEMENT OF REPRESENTATIVE VERNON J. EHLERS

I am pleased to participate in the Research and Science Education Subcommittee's markup of the reauthorization of the National Science Foundation (NSF). This Committee Print will be an important piece of the reauthorization of the America COMPETES Act.

It is challenging to find large areas at the Foundation in need of great improvement. This is an agency known for its responsible budgeting and respected for its merit-review and evaluation processes. Overall, I believe the bill we are considering today further strengthens the National Science Foundation and improves our nation's ability to compete globally.

However, I have a few reservations about some of the provisions we are considering today. Many of my colleagues are concerned that the authorized levels of funding for the NSF may be excessively high in light of our current economic situation, as well as the recent infusion of funds from the American Recovery and Reinvestment Act. I think that we can all agree that the NSF will function most effectively if we continue it on a strong doubling path that is also sustainable. I am hopeful that we can work together to find common ground on this issue and others that may raise questions about the appropriate roles and responsibilities of the NSF.

I want to recognize and thank the majority staff for working closely with the minority staff on many of the provisions included in the Committee Print, as well as incorporating a variety of expertise from the NSF stakeholder community. I look forward to continued collaborations as we improve and refine the Committee Print before us today.

Chairman LIPINSKI. Thank you, Dr. Ehlers, and thank you for all your collaboration on making things move smoothly here, run smoothly. I think it is the best way for things to run and certainly not just for this subcommittee but for the entire Congress to work out best for our country and in science in general, which is what we're here for.

Does anyone else wish to be recognized?

So at this point I ask unanimous consent that the print is considered as read and open to amendment at any point and that the members proceed with amendments in the order of the roster. Without objection, so ordered.

Chairman LIPINSKI. The first amendment on the roster is a Manager's Amendment offered by the Chair. The clerk will report the amendment.

The CLERK. Amendment number 006, amendment to the Committee Print offered by Mr. Lipinski of Illinois.

Chairman LIPINSKI. I ask unanimous consent to dispense with the reading. Without objection, so ordered. I recognize myself for five minutes to explain the amendment.

This Manager's Amendment makes a number of technical and clarifying changes to the legislation in addition to codifying the important statistical work of the Foundation and adding three new sections that focus on the critical issues of promoting innovation and improving STEM education.

The first amendment adds a new section that codifies the function of the NSF Division of Science Resources Statistics as a central federal clearinghouse for objective data on a scientific and engineering enterprise and the state of U.S. STEM education. SRS is responsible for the biennial Science and Engineering Indicators report that Congress relies so heavily on for an understanding of the state of U.S. competitiveness in science and technology. This section in reality is nothing more than a name change for SRS, but such a name change confers on them a status that truly reflects the critical work they do.

The next main section, Partnerships for Innovation, was introduced earlier as H.R. 4998 by Mr. Hill. This section requires the Director of NSF to carry out a program to support partnerships between institutions of higher education and private-sector entities in order to promote innovation and increase the economic and social impact of their research. The ultimate goal is for these kinds of partnerships between diverse institutions and local industry to help spur regional economic growth and ensure a well-prepared STEM workforce for local jobs.

Finally, the amendment introduces to the legislation two sections focused specifically on institutional reform and undergraduate and graduate STEM education. I want to thank Ms. Kosmas for introducing H.R. 4955, Transforming Undergraduate STEM Education, which has been incorporated as one of these sections. It authorizes a program of grants to colleges and universities to reform undergraduate STEM education, both to increase the number of STEM graduates and to improve STEM education for all students. This provision will go a long way to spurring the kind of institutional transformation that will result in better preparation of our graduates for the 21st century workforce.

The Manager's Amendment also includes a section on 21st Century Graduate Education. This language is based on Ms. Giffords' bill, H.R. 4968. NSF has long provided financial support to graduate students through fellowships and traineeships, but there have been limited programs focused on ensuring that today's STEM graduate students are graduating with the broader set of skills necessary to compete for 21st century jobs in all sectors, including academia, industry and government. This provision helps fill this gap in NSF's current portfolio.

Once again, I want to thank my colleagues, Mr. Hill, Ms. Kosmas and Ms. Giffords for their excellent contributions to this legislation and my Republican colleagues and their staff for all their hard work to help strengthen and clarify the language in both this

amendment and the underlying bill, and I urge my colleagues to support this amendment.

[The prepared statement of Chairman Lipinski follows:]

PREPARED STATEMENT OF CHAIRMAN DANIEL LIPINSKI

This manager's amendment makes a number of technical and clarifying changes to the legislation in addition to codifying the important statistical work of the Foundation and adding three new sections that focus on the critical issues of promoting innovation and improving STEM education.

First, the amendment adds a new section that codifies the function of the NSF Division of Science Resource Statistics (SRS) as the central Federal clearinghouse for objective data on the scientific and engineering enterprise and the state of U.S. STEM education. As you may know, SRS is responsible for the biennial Science and Engineering Indicators report that the Congress relies so heavily on for an understanding of the state of U.S. competitiveness in science and technology. This section in reality is nothing more than a name change for SRS, but such a name change confers on them a status that truly reflects the critical work they do.

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Finally, the amendment introduces to the legislation two sections focused specifically on institutional reform in undergraduate and graduate STEM education. I want to thank Ms. Kosmas for introducing her bill, H.R. 4955, on transforming undergraduate education in STEM, which has been incorporated into the manager's amendment. This section authorizes a program of grants to colleges and universities to reform undergraduate STEM education, both to increase the number of STEM graduates and to improve STEM education for all students. This good provision will go a long way in spurring the kind of institutional transformation that will result in better preparation of our graduates for the 21st century workforce.

The manager's amendment also includes a section on 21st Century Graduate Education. This language is based on a bill that Ms. Giffords introduced recently, H.R. 4968. NSF has long provided financial support to graduate students through fellowships and traineeships. But there have been limited programs focused on ensuring that today's STEM graduate students are graduating with the broader set of skills necessary to compete for 21st century jobs in all sectors, including academia, industry and government. This provision helps fill this gap in NSF's current portfolio.

Once again, I want to thank my colleagues Mr. Hill, Ms. Kosmas, and Ms. Giffords for their excellent contributions to this legislation, and my Republican colleagues and their staff for all of their hard work to help strengthen and clarify the language in both this amendment and the underlying bill, and I urge my colleagues to support this amendment.

Chairman LIPINSKI. Is there further discussion on the amendment? The Chair recognizes Dr. Ehlers.

Mr. EHLERS. Thank you, Mr. Chairman. I am generally supportive of the Manager's Amendment that you have offered. I understand that we are more explicitly codifying the science and engineering statistics office at the National Science Foundation and the Partnerships for Innovation program. In addition, we are strengthening STEM education for undergraduates, broadening graduate education opportunities and making other minor changes to the bill based on feedback from members and various stakeholders.

My only concern is with specific regard to the Partnerships for Innovation section. I want to make sure that we have the benefit of hearing what comes out of the workshop NSF is holding on this topic within the next few weeks. I hope that you will continue to work with us to ensure that this language that we eventually adopt

best captures what will make this program most effective at the Foundation, and with that, I yield back.

Chairman LIPINSKI. Dr. Ehlers, would you yield to me to respond on that?

Mr. EHLERS. Yes, please proceed.

Chairman LIPINSKI. The workshop that is going to take place, we will have the opportunity to incorporate any suggestions, any recommendations from that workshop into this before we proceed. We will be moving forward in two weeks in Full Committee, incorporating this legislation into the *America COMPETES Act*, and you can be assured that we will work to incorporate what comes out of that workshop.

Mr. EHLERS. Thank you.

Chairman LIPINSKI. Any further discussion on the amendment? The Chair recognizes Dr. Baird.

Mr. BAIRD. Mr. Chairman, first of all, I commend you for this outstanding piece of work and like my colleague, Mr. Ehlers, am supportive of the Manager's Amendment.

I have had the opportunity in recent months to meet with a number of nonprofit innovators who are using technology and other skills to create products that might not be commercially competitive but made a tremendously important niche, for example, software or hardware applications for people with disabilities, orphan drugs, et cetera. By the nature of these enterprises and their products, they are not for profit and intentionally so, and for too long they have been excluded from federal programs like SBIR and to some degree from NSF competition. Hence, within the Partnership for Innovation, if we look at line 15 of page 4, I would hope the chairman will be amenable—I am not going to offer it as an amendment here today but I would hope the Chair would be amenable to adding the word “nonprofit” there on line 15 or in section B where it says “may include other institutions of higher education, public institutions and private-sector entities,” the premise being that all of the rationale for including those entities as partnerships would also apply to not-for-profit sectors such as I have just described.

So if the Chair would be amenable to considering this between now and final passage, I would be grateful. If not, I would probably offer it as an amendment today but I don't think it is probably necessary.

Chairman LIPINSKI. Dr. Baird, we will work with you on that to see what we can do there. It sounds like an ostensible recommendation, so we will work with you as we move forward.

Mr. BAIRD. I thank the Chair.

Chairman LIPINSKI. Is there any further discussion on the amendment? If no, the vote will occur on the amendment. All in favor, say aye. All opposed, say no. The ayes have it and the amendment is agreed to.

The second amendment on the roster is an amendment offered by the Chair. The clerk will report the amendment.

The CLERK. Amendment number 060, amendment to the Committee Print offered by Mr. Lipinski of Illinois.

Chairman LIPINSKI. I ask unanimous consent to dispense with the reading. Without objection, so ordered. I recognize myself for five minutes to explain the amendment.

The amendment at the desk would create an innovation inducement prize pilot program at the National Science Foundation. In recent years, innovation inducement prizes have been offered not only by the private sector but also by the Federal Government through NASA, the DOE and the Department of Defense. Although the NSF has not used such prizes, language in the 2006 appropriations bill led to a National Academy study of the idea. The study concluded that an ambitious program of innovation inducement prize contests will be a sound investment in strengthening the infrastructure for U.S. innovation. Thus, they recommended that NSF embrace this challenge as an opportunity both to advance science and engineering and to learn a great deal more than we now know about what may prove to be a valuable mode of support for research and innovation. My amendment would simply implement the recommendations of this report by creating a small pilot program at NSF to explore what could be a valuable mode of support for research and innovation. Specifically, it authorizes \$12 million for up to five prizes that could run for as many as seven years.

I see two primary benefits of such a program. First, it is another way to encourage high-risk, high-reward research unlike a traditional grant proposal which necessarily focuses on incremental challenges that can be solved during the grant period. A prize contest can highlight important problems that nobody knows how to solve. Second, if it is done right, a prize program can help the NSF and the scientific endeavor with public relations. It can generate excitement and interest in the frontiers of science. There are other benefits too, such as researching a broader range—reaching a broader range of researchers than a traditional grant.

But I want to caution that not all problems are well suited to innovation inducement prizes, and this is in no way intended to replace the grant making that the NSF does so well. I would also like to point out that the intent of this program is to promote innovation in basic science and engineering rather than the creation of specific technologies or products.

Ultimately, the goal of this amendment is to further diversify our approach to funding science and engineering. I think there are a number of potential benefits and that a pilot program is the right way to see exactly how useful innovation inducement prizes can be. I urge my colleagues to support this amendment.

[The prepared statement of Chairman Lipinski follows:]

PREPARED STATEMENT OF CHAIRMAN DANIEL LIPINSKI

The amendment at the desk would create an innovation inducement prize pilot program at the National Science Foundation.

The idea of innovation inducement prizes at the NSF may be new to some of you, so let me briefly offer some background before getting into the details of my amendment. Governments have been offering prize purses for solutions to predefined scientific or technological problems since at least 1714, when the British government offered the “Longitude Prize” for improvements in navigation at sea. This prize resulted in advances in astronomy and timekeeping. Since then, we have seen prizes offered in everything from aviation to biomedicine to pure mathematics.

Innovation inducement prizes have been used by NASA, the DOE, the Department of Defense, and the private sector, but they have not been used by the NSF.

In 2006, appropriations language led to a National Academies study of the idea, one which concluded that innovation inducement prizes would be “a sound investment in strengthening the infrastructure for U.S. innovation.”

My amendment would implement the recommendations of this report, creating a small pilot program at the NSF to explore what could be a valuable mode of support for research and innovation. Specifically, it authorizes \$12 M for up to 5 prize contests that could run for as many as 7 years.

I see two primary benefits to such a program. First, it is another way to encourage high-risk/high-reward research. Unlike a traditional grant proposal, which necessarily focuses on incremental challenges that can be solved during the grant period, a prize contest can highlight important problems that nobody knows how to solve. Second, if it's done right, a prize program can help science with its public relations problem. It can generate excitement and interest in the frontiers of science, like what the Netflix prize did for an obscure computer science problem or the X-prize did for space flight.

There are other benefits too, such as reaching a broader range of researchers than a traditional grant. But I want to caution that not all problems are well suited to innovation inducement prizes, and that this is in no way intended to replace the grant-making that the NSF does so well. I would also like to point out that the intent of this program is to promote innovation in basic science and engineering rather than the creation of specific technologies or products.

Ultimately the goal of this amendment is to further diversify our approach to funding science and engineering. I think there are a number of potential benefits, and that a pilot program is the right way to see exactly how useful innovation inducement prizes can be.

I urge my colleagues to support this amendment.

Is there any further discussion on the amendment? The Chair recognizes Dr. Ehlers.

Mr. EHLERS. Thank you, Mr. Chairman. I think prizes are an excellent idea. They have a place and they have been used very effectively in certain areas. I have some concerns about NSF being part of that process. I am not aware of any evidence that they are equipped at this point to implement the program in an effective manner, and I am also concerned about statements made by the current Director who as you know is leaving shortly, when he says at this type of prize is not appropriate for the National Science Foundation, and I think we need further conversations with each other and with the outgoing Director and perhaps with the National Science Board itself as to whether or not this is an appropriate activity for the National Science Foundation and how this activity would mesh with their current grant-making efforts. I am not in the camp of being opposed to something just because it is new, but I am in the camp that says examine it very carefully when you have a system that is working effectively, and we are not sure how a new system might impact the current system. So I am just saying, I am willing to consider it, and I think we should look more carefully at it than we have, and particularly review what the outgoing Director says and perhaps if we can wait a while, what the incoming Director prefers about this, and also get some reaction from the scientific community as to whether or not they think it is an appropriate activity for the National Science Foundation.

So I am basically taking the slow approach and say let us look at this carefully and decide what we really will be doing, will it be effective or will it not be. I will yield back.

Chairman LIPINSKI. Dr. Ehlers, I recognize your concerns. That is why we are moving forward with this as a pilot project. The National Academies' report, as I mentioned in my statement, did recommend that NSF do this. I think the pilot will present an opportunity to see how successful NSF can be with the inducement prize

approach to funding research. Clearly, this is a very, very small piece of what the NSF is going to be authorized for as compared to the grants that will be authorized in this bill, and so I think that this is the right first step to be making to have such a pilot program, and I know that we have a new NSF Director coming in and certainly we will work with him or her on how to best do this at the NSF, but I think this is the proper way to be going about moving forward on this, and if there are further enhancements, further revisions that need to be made as the process moves along, we will see if we have an NSF—when we will have the NSF Director in place. We are not certain right now what the time period is going to be but I think moving ahead with the inducement prize pilot program is the right move at this time.

Is there further discussion on this? Mr. Neugebauer.

Mr. NEUGEBAUER. Thank you, Mr. Chairman, and, you know, I love the incentive program. I came from about 25 years of incentive that if you sold something, you got to eat, and so I understand incentives extremely well and I appreciate I think the spirit of which the chairman is headed.

You know, when I look at this agency, I think they are already giving out prizes because basically they are granting money hopefully for projects that show innovation and promise and so I guess I am having a little bit of a problem of understanding, you know, when do you get a grant and when do you get a prize and whether this is the appropriate forum for that kind of a program. Do you follow what I am saying? Because hopefully every billion dollar or every single dollar that we are authorizing here is going for projects that are innovation and show promise and that we shouldn't be just looking for one, that they all ought to meet that criteria, so I appreciate the Chairman's being innovative and creative here. There may be a place in our jurisdiction here of where this is appropriate place to be but I am questioning if this is the place for that to be since I hope that is already the job that they are doing, and I would yield to the gentleman to respond to that.

Chairman LIPINSKI. Well, I think what you started out your statement with, saying that the incentive that if you produce, then you can eat, basically that is what we are looking at here with the inducement prizes. With most grants, you have a proposal of research. You hope to find results. You are looking to find results but you don't know what that is going to be. This is a situation where no money is going to anyone until they produce a result that is being sought, and these are going to be results that are determined, that the NSF determines, that are important in terms of innovation, finding solutions to problems, whatever it is that the NSF decides are important results they are looking for. It is just another way of doing this rather than saying upfront, here is the money and hopefully this research will yield a result. It is, you go out there, do the work, find the result, and if you do, then you get the prize, and in many ways I think that it is just a different way of going about it, but it is exactly what you said. If you don't produce, you don't eat, and I think that is something good to look at, at least, and the pilot program is a way to look at that. I yield back.

Mr. NEUGEBAUER. Reclaiming my time. Well, I guess the question I have is that is there anything in the way that we have structured NSF now that they couldn't do that without—in other words, if somebody brings, you know, a good idea to the table or a successful solution, that NSF couldn't reward them. Because generally what those projects, while they may be moving in a direction, you know, they are a new discovery but generally they require refinement before commercialization and generally I would think that is what you are looking for here is an idea that somebody has come up with, it is a great idea, you want to give them a prize for it but at some point in time generally there is another step or two to commercialize those good ideas, and is there anything that prevents them from—I believe they have the authority to do that right now.

Chairman LIPINSKI. My understanding is that right now that is not the way that the NSF works, that they do not have authorization right now to offer a prize. It is all just upfront that you are given—you put in a proposal. If that proposal is determined-it will be funded, you will receive the grant, and that is the only way that NSF right now is authorized to give out the money. It would need authorization to be able to do this.

Mr. NEUGEBAUER. I think there is some disagreement whether that is the case or not. I am not a lawyer so I am not going to—

Chairman LIPINSKI. I am not one either.

Mr. NEUGEBAUER. Well, could we get feedback from counsel on whether you think this currently—that this requires—sometimes, you know, the bureaucrats want to, you know, get Congress to say they can do what they already have the ability to do.

The COUNSEL. I believe, Congressman, we would have to verify this but I believe the sticking issue could be how appropriations works for the National Science Foundation. The way the prize program language is written, NSF can hold onto the money for seven years before they reprogram it to allow the prize program to play out. Normally NSF is given appropriations on an annual basis and they can't just hold onto money indefinitely without committing it, obligating it to some research project or such things. So we can go back and verify that and get back to you, but that is my suspicion, that the authorization is lacking because of the appropriations issue.

Chairman GORDON. Will the gentleman yield? I think that the distinction here is that currently, the NSF can give grants for good idea. What Mr. Lipinski wants to do is be able to give a grant for a good product, so that is, you know—or a good result, you could say. So I think that is really the distinction.

Mr. NEUGEBAUER. But isn't the purpose of NSF more for basic research than applied? I mean, we are moving in a different direction here? I mean—

Chairman LIPINSKI. This is something that I want to make sure that we don't get into the realm of thinking that this is about producing a product, because we look at other prizes and we sometimes think well, it is going—we are talking about a product. There are other potential prizes. We just had the Clay Math Institution's Millennium Challenge Prize. The Poincaré conjecture was solved under this program. It was a 100-year-old topology problem. So it was purely a mathematical problem. We are looking at prizes here

not to be moving to, okay, you get a prize for producing a product, but there are breakthroughs that are being sought in science and technology, not necessarily products but breakthroughs that are being sought that inducement prizes could play an important role in providing that incentive.

Is there further discussion on this amendment? The Chair recognizes Mr. Inglis.

Mr. INGLIS. The Chairman and I share co-paternity with the H-Prize, so I am very excited about prizes. It is a great idea to have prizes that incentivize breakthrough discoveries. One of the things we learned as you recall from Peter Diamandis, Chairman of the X PRIZE, testifying here a while back is that—when we were working on the H-Prize—is that prizes are successful if they have clearly defined metrics just beyond what is currently achievable, and that of course was the secret to the X PRIZE and it worked very well. That's what Dr. Lipinski and I worked on in coming up with the H-Prize, and that is underway, and of course the Department of Energy will now be administering that prize. Along the way, we heard from the National Science Foundation, as you recall, that they really didn't want to administer that prize, which it made me scratch my head because it is rare that a federal agency says that they don't want more money or authority, and so—and I am not sure that I am here to advocate strongly for the position of agreeing with them, because it does seem that NSF is a place that could be very involved in the creative process of figuring out what the prize metric should be and putting them just beyond what is achievable, but what they told us back in the H-Prize is that they didn't want to do that, that they would prefer for it to be done elsewhere. Like I said, I am just restating what they told us in the H-Prize. I am not sure I am really committed to that conclusion they drew but it is, however, their conclusion. I don't know if Dr. Lipinski has some thought about why it was that they didn't want us to do this in their jurisdiction.

Chairman LIPINSKI. If the gentleman will yield?

Mr. INGLIS. I would be happy to.

Chairman LIPINSKI. I believe that the NSF is looking at the H-Prize—the NSF believed that that got out of their basic science, doing basic science, and I think again we need to go back and look at this again and think about this. We are not talking about the—the H-Prize was looking at making some advances which were—some of them have to do with a product. Some would have to do with maybe a process, but I think there is a line there the NSF was concerned about crossing with the H-Prize, into an area beyond basic science in research that they may not have wanted to get into there, and I think that may have been the reason why the NSF took that position with the H-Prize specifically.

Mr. INGLIS. Reclaiming my time. I think that is a very helpful distinction, and it is—to the earlier discussion about whether it is products or breakthroughs and processes or—keeping it in the basic science realm would be an interesting distinction here because I agree with you, the H-Prize really did have metrics where we were trying to get to products and trying to get to the market, and perhaps that is why NSF wasn't so thrilled with it or didn't think it was in their bailiwick, but if it is some metric that those

of us that just play scientists on the Science Committee couldn't understand, in other words, some very clear metric in some field that is basic science, then perhaps NSF would be excited about administering such a prize there. That is a helpful distinction you just have drawn, I think. I yield back, Mr. Chairman.

Chairman LIPINSKI. Thank you.

Is there further discussion on the amendment? Dr. Ehlers.

Mr. EHLERS. Just very quickly, I am very intrigued by Mr. Neugebauer's comment, and Texas really knows how to do things well, his comment that you don't get to eat unless you work, and so perhaps this would be a way of shortening our committee meetings. The shorter the meeting, the more donuts you get, but if you raise any issues about global climate change, you don't get any donuts, and that would probably speed up our committee meetings. Thank you.

Chairman LIPINSKI. Thank you, Dr. Ehlers.

Any further discussion on the amendment? If no, the vote will occur on the amendment. All those in favor, say aye. All opposed, say no. In the opinion of the chair, the ayes have it and the amendment is agreed to.

The third amendment on the roster is an amendment offered by the gentleman from Texas, Mr. Neugebauer. Are you ready to proceed with your amendment?

Mr. NEUGEBAUER. I am having several conversations here, Mr. Chairman. I apologize for that. I have an amendment at the desk, Mr. Chairman.

Chairman LIPINSKI. The clerk will report the amendment.

The CLERK. Amendment number 009, amendment to the Committee Print offered by Mr. Neugebauer of Texas.

Chairman LIPINSKI. I ask unanimous consent to dispense with the reading. Without objection, so ordered. I recognize the gentleman for five minutes to explain the amendment.

Mr. NEUGEBAUER. I thank you, Mr. Chairman, and first of all, let me preface by saying, you know, I think research is very important. There is a lot of very important things that the Congress is involved in. Unfortunately, we have reached a time in our country where we are going to have to make some choices. American families all across the country are having to make choices right now. Many of them are unemployed. Some of them are behind on their mortgages. They have too much credit card, maybe bought a little more house than they should, and I get letters from them on a daily basis telling me, you know, Congressman, we are cutting back, we are taking second jobs, we are trying to get our financial house in order, and you know, I think the number one question that they ask me is, why isn't Congress doing the same thing, and we hear a lot of our leaders talking about it. We heard the President talk about our dire fiscal state of the union, but unfortunately, the budget that was sent over by the White House doesn't reflect a lot of concern or bring us in a direction that would reduce these deficits. The Congressional Budget Office the other day said that by 2020, that our debt will be at a level that is 90 percent of our economy. That is an alarming number. We just came off of a \$1.4 or \$1.5 trillion deficit. We are headed in that direction as well, and it just appears to me that we have to at some point in time say,

you know what, some of these things are good, they are important but right now, you know, we have to sharpen our pencils a little bit.

And basically what my amendment does is, it just reduces the overall authorization from five years to three years and would change the cost of this legislation from \$47.5 billion to \$26.7 billion, still allows the three-year authorization, has some increases, as the Chairman is aware, but, you know, I think we are going to have to start dealing in a little bit shorter time frame because we really don't know what the future holds, and if in three year, for example, we haven't made any progress on this deficit, you know, we are going to have to take a look at that. You know, I almost kind of call this a sunset provision. In Texas, as Mr. Ehlert said, I think we do do some things right and one of the things we do in Texas is, we sunset these programs and so you have to come back and say, you know, we need to reauthorize these, we don't need to let this sunset, but, you know, what has been the results of the money that we have invested on behalf of the American people. We have to remember who this money belongs to. This doesn't belong to you and me. This money belongs to the American people, and unfortunately, we are having to go to a Chinese bank to finance a lot of our projects. Over 41 cents of every dollar we are spending right now we are borrowing from others. So I just think this is a commonsense approach. I think it keeps the funding levels at a sustainable rate for the next three years but it does just reign in the time frame and begins to look at, based on the way CBO scores, you know, they look at a 10-year horizon here and so I would encourage my colleagues to think about the American taxpayers and think about our children and our grandchildren who are going to eventually have to pay for these things that we didn't have the courage quite honestly to pay for while it was on our watch, so I yield back.

[The prepared statement of Mr. Neugebauer follows:]

PREPARED STATEMENT OF REPRESENTATIVE RANDY NEUGEBAUER

Thank you Mr. Chairman, I have an amendment at the desk.

We often hear from the President and leaders here in Washington of the dire fiscal state of our nation, but regrettably the President's budget for 2011 continues Washington's out-of-control spending habits.

A report by the Congressional Budget Office confirms this and shows that the President's latest budget drives debt to an alarming 90 percent of the economy by 2020, pushes spending to \$3.8 trillion in 2011, widens the deficit to \$1.5 trillion in 2010, and raises taxes by \$1.8 trillion through 2020.

And today, we're here to ensure we follow that downward trajectory unless we take action to rein in our out of control spending. We are proposing to reauthorize the National Science Foundation for 5 years at a cost of almost \$48 billion.

The Committee print before us authorizes more than \$48 billion over five years.

As we know, recently, as part of the overall package of COMPETES, the Energy and Environment Committee passed similar legislation authorizing nearly \$41 billion. My amendment would simply reduce this authorization from 5 years to three, holding off on spending almost \$21 billion that we would ultimately have to borrow.

I assume this will be viewed as a slash and burn amendment, it is not my intention. By adopting my amendment, we will be on the road to reauthorizing the National Science Foundation at a more than sufficient level of nearly \$27 billion—\$27 billion over 3 years.

Its time we work to restore some fiscal sanity here in Washington and set responsible levels of funding. Additionally, by setting this on a 3-year path rather than five, it provides future Congresses the opportunity to review this issue and make changes sooner, rather than later.

I urge adoption of this amendment.
[Yield the balance of your time].

Chairman LIPINSKI. Thank you, Mr. Neugebauer. The Chair will recognize himself.

I understand your concerns and certainly share your concerns about the deficit and our federal debt, and the idea of having a shorter time frame if we are looking at a program that the Congress is creating or we are mandating exactly how the money is being spent, if that were the case here, I might be a little more open to making it a shorter authorization time. What we are looking at here, I don't believe any of us are talking about sunseting the NSF and in three years eliminating the NSF, and that is where I think that this is a different situation from what you were speaking of that could be applied elsewhere. The determination of—first of all, I think we agree that we want to keep the National Science Foundation. It certainly has a history of success, so I don't think anyone is saying well, maybe in three years we are going to decide it is not a good place to be spending our money anymore. So I think that doesn't apply here. It may apply to other programs we may be looking at.

Mr. NEUGEBAUER. Would the gentleman yield?

Chairman LIPINSKI. Yes.

Mr. NEUGEBAUER. I think maybe the sunset word was not the right word. Sometimes you can use the wrong word. I think the point I did want to make is that we may be in a situation in three years where even though NSF is doing those kinds of things that we want it to be doing, we just may not be able to sustain it at that level, and so I guess that point we may have to say and we may not have to say—I am hopeful that the jobs that we have all been promised start showing up and the economy gets back on track, but that is not the direction that we are headed right now and so I think that is the reason that shortening the threshold, maybe being more prudent—companies and families do that, you know, you have to say you know what, we are going to—over the next two or three years maybe we are not going to take as many vacations or we are not going to buy new furniture or we are not going to replace the car. They are driving their car a little bit longer. I think these are the kinds of choices that the American people quite honestly are a little puzzled at the United States Congress in making some of those same kinds of—having that kind of dialog and making those tough choices, and they are not fun choices to make.

Chairman LIPINSKI. Reclaiming my time. Again, I agree that families are making a lot of tough choices right now but the way I look at this bill is, we should not—hopefully we are not seeing families make the choice of saying, well, we will send our child to college for one year and that is all we will plan on and we will see how things go from there. It is an investment that we are making in the future for our country. The original COMPETES was a three-year bill. This gave us a chance today to revisit some of the issues we didn't address in 2007 and respond to some of the reports that are required in the bill, but I don't think that really gave us enough time to evaluate the progress of everything the Foundation implemented based on the 2007 bill.

An issue that I had was raised a number of times in hearings but especially in listening sessions I had was as with any research program, you need consistency and reliability of resources. In order to foster innovation, you have to have—know that there is a commitment there and I think the five-year time period is the right amount of time to be committed here to the NSF and what funding level that we are going to give in funding the NSF in general, and so I think that that is the right choice that we made with this bill to have a five-year time period. With that, I will yield back.

Does anyone else have—the Chair recognizes Mr. Hall.

Mr. HALL. I was listening to Mr. Neugebauer and he has a right to get at least one word wrong. We had a vice president who couldn't spell potato, so that one bit, he can blame that on his speechwriter, and I have just spoken to him and he denies that he put it in there. He is from deep west Texas and you have to make some exceptions for him sometime.

I think it is a very reasonable request. I was waiting to hear Dr. Ehlers and see what he said, but this doesn't lower the authorization amounts, it simply makes it a three-year bill versus a five-year bill, and I support a robust budget for NSF fully dedicated to keep them on a doubling path but it is important that we do use diligent oversight of the provisions we are putting into place, and NSF will probably have a new director in place within the year, might even have a new President with a couple of years or maybe within a year if he keeps going to Russia and signs something we won't use any method of national defense we have if we are attacked. We don't yet know what plans that new director may have in mind, and the amendment would reduce the overall price of this bill by over \$20 billion and that is a savings of over 44 percent. I think those are things we need to be thinking about, and I yield back my time.

Chairman LIPINSKI. Is there further discussion? The Chair recognizes Dr. Baird.

Mr. BAIRD. Mr. Chairman, a couple of quick points. We had in the run-up to this markup hearings in which organizations respected by both parties but I think that tend to be favorably appreciated certainly by my colleagues on the other side of the aisle including the National Association of Manufacturers, the Chamber of Commerce, the Business Roundtable, the Council on Competitiveness. All of those organizations, those radical organizations, support a five-year bill, and I think they support a five-year bill because, recalling their testimony, they recognize that if we are to be competitive, if we are to get out of this deficit, if we are to create jobs, if we are to solve our energy problems and stimulate our economy, et cetera, we have to have that core infrastructure of science and technology, and this bill is designed to do that.

So consistent with their support of this bill, I think we need a five-year bill, but beyond that, I think we need to understand how these kinds of programs work. If you just do a three-year authorization, the institutions and investigators and the collaborations that this bill particularly calls for, which are consistent with the testimony that we have heard, those efforts depend on some kind of time frame and predictability. If we do just a three-year authorization, institutions that might be seeking to formulate teams, for

example, to work on a particular area of investigation, they need to know that that is going to be there for a while. Otherwise the risk is that you put together a collaborative team, topflight researchers, you apply for the grant, and guess what, you just lost the reauthorization a couple years after and you are not able to compete for it or you are not able to fulfill it.

So both because of the practicalities of the way people apply for and utilize grants in the real world, not this world but the real world, and the recommendations of the various aforementioned organizations, I would urge defeat of this. And the other thing I would say is, I think with respect to both gentlemen from Texas, unless we are saying that at the end of three years we are going to stop the NSF, which I think would be catastrophic for this country, then we are not really saving anything. I mean, this is the old trick of, we are going to sunset the tax cuts and say 'look how much cheaper these tax cuts are.' The fact is, we are going to reauthorize NSF in a couple of years.

The other fact is, there is nothing saying we can't engage in annual oversight, which we should do and we do on an ongoing basis, but Mr. Neugebauer wants some time and I am happy to yield.

Mr. NEUGEBAUER. I just want to be clear. You know, my amendment does not reduce the level of funding for those three years. So I think we are good to go on that. The initial authorization was three years, and so we are just—we are coming up on that three-year period. We are going to do it another three years, and, you know, I think people probably have some assurance, you know, that we are going to have an NSF reauthorization hopefully in three years, if my amendment passes, but it does put I think some—to me, puts a string there that if I am at NSF, I am going to look very carefully at the projects and the grants that I am putting out because, you know, I realize that these are not infinite resources and there is a possibility that if the trends continue, that, you know, people don't build a program that we may not be able to sustain. We may have to come in and of course obviously at the appropriation level, you know, cut down the funding for that. But I just think if it was good enough to start the program, it is good enough to continue the program, and I thank the gentleman for his time.

Mr. BAIRD. You bet. The other thing to be aware of is, some projects expand more than a couple of years, and by their nature they require multiyear investments, and there is actually a false economy. If you ask somebody to commit to an investment of infrastructure, time, equipment, personnel, et cetera, the mobilization costs of that and then suddenly there is a risk that you pull the plug at the end of it, you are not actually doing yourself a service. People instead will shy away from sustained commitment that may yield the more beneficial results and focus on the sure thing, maybe the easier and less substantial thing. I think we all, I hope, share the commitment to be fiscally responsible here, but I don't think creating unpredictability in the research environment is consistent with that, nor is it consistent with the desires of the National Associate of Manufacturers, the Chamber of Commerce, the Business Roundtable or the Council on Competitiveness, and I yield back.

Chairman LIPINSKI. Is there further discussion? The Chair will recognize Dr. Ehlers.

Mr. EHLERS. Thank you, Mr. Chairman. I think the most important thing to remember is not just this committee but the entire Congress is already on record as supporting a doubling of the funding of the National Science Foundation, and that action was taken—took place a couple of years ago. So the commitment is already there that we will double the funding for the National Science Foundation over a period of seven years.

I think the best argument for Mr. Neugebauer's amendment is the change of directors, and I think we retain more flexibility if we ensure that when the new director comes in, he has an understanding that we have a three-year budget but we would like to work with the new director on pinning down what is going to be in the next part of the seven-year doubling and it gives the new director more of an opportunity to review where the Foundation is and where it should go in the next few years, particularly after the three years is up. So I think there is a good argument to proceed with Mr. Neugebauer's amendment and I don't see this as permanently impinging on the budget of the NSF. It just gives the opportunity for the new director to put his stamp on whatever he is going to adopt and also recognize in the same breath that the Congress has already said we want to double it in seven years and so that will be his goal that he can aim for. It may well take him close to three years just to come up with feeling comfortable in his new job and coming up with a number that he would like to see at that point. I yield back.

Chairman LIPINSKI. Thank you, Dr. Ehlers.

Any further discussion on the amendment? If no, the vote will occur on the amendment. All those in favor, say aye. Those opposed, say no. The no's have it. The amendment is not agreed to.

Mr. Neugebauer?

Mr. NEUGEBAUER. Could I have a recorded vote, and would some of the majority like go to make a cell phone call while we vote?

Chairman LIPINSKI. The clerk will call the roll.

The CLERK. Chairman Lipinski?

Chairman LIPINSKI. No.

The CLERK. Chairman Lipinski votes no. Ms. Johnson?

Ms. JOHNSON. No.

The CLERK. Ms. Johnson votes no. Mr. Baird?

Mr. BAIRD. No.

The CLERK. Mr. Baird votes no. Ms. Fudge?

Ms. FUDGE. No.

The CLERK. Ms. Fudge votes no. Mr. Tonko?

Mr. TONKO. No.

The CLERK. Mr. Tonko votes no. Mr. Carnahan?

Mr. CARNAHAN. No.

The CLERK. Mr. Carnahan votes no. Mr. Gordon?

Chairman GORDON. No.

The CLERK. Mr. Gordon votes no. Mr. Ehlers?

Mr. EHLERS. Aye.

The CLERK. Mr. Ehlers votes aye. Mr. Neugebauer?

Mr. NEUGEBAUER. Aye.

The CLERK. Mr. Neugebauer votes aye. Mr. Inglis?

Mr. INGLIS. Aye.
 The CLERK. Mr. Inglis votes aye. Mr. Bilbray?
 [No response.]
 The CLERK. Mr. Hall?
 Mr. HALL. Aye.
 The CLERK. Mr. Hall votes aye.
 Chairman LIPINSKI. Have all members been recorded?
 The CLERK. Yes.
 Chairman LIPINSKI. The clerk will report the roll.
 The CLERK. Mr. Chairman, four members vote aye and seven members vote no.

**SUBCOMMITTEE ON RESEARCH AND SCIENCE EDUCATION
 COMMITTEE ON SCIENCE AND TECHNOLOGY**

DATE – April 14, 2010

ROLL CALL _____

BILL *Committee Print – National Science Foundation Authorization Act of 2010*

AMEND # 3 PASSED DEFEATED VOICE VOTE WITHDRAW

SPONSOR/ AMENDMENT – Neugebauer – 009

MEMBER	AYE	NO	PRESENT	NOT VOTING
Mr. LIPINSKI, Chair		✓		
Ms. JOHNSON		✓		
Mr. BAIRD		✓		
MS. FUDGE, Vice Chair		✓		
Ms. TONKO		✓		
Mr. CARNAHAN		✓		
Mr. GORDON, Ex-officio		✓		
Mr. EHLERS, Ranking Member	✓			
Mr. NEUGEBAUER	✓			
Mr. INGLIS	✓			
Mr. BILBRAY				
Mr. HALL, Ex-officio	✓			
TOTALS	4	7		

Mr. Chairman, 4 Members vote AYE and 7 vote NO

Chairman LIPINSKI. The amendment is defeated.
 The fourth amendment on the roster is an amendment offered by the gentleman from Texas. Are you ready to proceed with your amendment?
 Mr. NEUGEBAUER. Mr. Chairman, I have an amendment at the desk.
 Chairman LIPINSKI. The clerk will report the amendment.

The CLERK. Amendment number 007, amendment to the Committee Print offered by Mr. Neugebauer of Texas.

Chairman LIPINSKI. I ask unanimous consent to dispense with the reading. Without objection, so ordered. I recognize the gentleman for five minutes to explain the amendment.

Mr. NEUGEBAUER. Thank you, Mr. Chairman. Section 203 of the underlying bill directs the National Science Foundation to carry out a program to award merit-based grants to universities to support fundamental research, research that would hopefully lead to the transformative advances in manufacturing technologies, processes and enterprises that will support U.S. manufacturing through improved performance and productivity. However, I am concerned that we are going down a road of establishing a prescriptive list that just could easily perhaps be resolved through report language. While many of these are worthy areas where we should be focusing our energy and limited resources, although Congress doesn't appear to have a real appetite to limit resources, my worry is that once again we are getting into the business of picking winners and losers, and I don't think that this is a bad list but I wonder if by putting this in the bill rather than perhaps in report, we are boxing ourselves in and ultimately the National Science Foundation being boxed in as well, and we risk eliminating alternative avenues for research by unwittingly providing limitations.

So I guess what I am saying here is that, you know, sometimes Congress can try to micromanage too much and in many cases we don't manage enough, but I just wonder here if we are being too prescriptive, and with that, I yield back my time.

[The prepared statement of Mr. Neugebauer follows:]

PREPARED STATEMENT OF REPRESENTATIVE RANDY NEUGEBAUER

Thank you Mr. Chairman, I have an amendment at the desk.

Section 203 of the underlying bill directs the National Science Foundation to carry-out a program to award merit-based grants to universities to support fundamental research.

Research that would hopefully lead to transformative advances in manufacturing technologies, processes and enterprises that will support U.S. manufacturing through improved performance and productivity.

However, I have a concern that we are going down the road of establishing in law, a prescriptive list that could just as easily be perhaps be resolved through report language.

While many of these are worthy areas where we should be focusing our energy and [limited] resources (although this Congress doesn't appear to have the appetite to limit resources), my worry is that we're once again getting into the business of picking winners and losers.

I do not think this is a bad list, but I wonder if by putting this in the bill, rather than perhaps the report we're boxing ourselves and ultimately the National Science Foundation in here. And do we risk eliminating alternative avenues for research by unwittingly providing limitations.

I urge adoption of this amendment.

[Yield the balance of your time].

Chairman LIPINSKI. Thank you. The Chair will recognize himself for five minutes.

This amendment, which would eliminate the list of areas in manufacturing is a—well, first of all, the list is a non-binding list, and I know that there always will be discussions, maybe disagreements over how much—what Congress should be saying, what Congress should not be saying, but I think that it is a role of this committee to indicate our priorities for federal investments in research. Every-

one has agreed that these research areas are important for advancing manufacturing technologies, processes and systems. They will be critical to revitalization of our manufacturing base. In fact, the NSF currently supports research in all of these areas, and I believe that this list simply—first of all, it doesn't tell NSF what they must fund, but points out the priorities that this committee has when it comes to manufacturing and funding research in these areas. I don't think that we are necessarily picking the winners and losers, and I think that this is a proper role of Congress and this committee in this bill. So I am going to urge my colleagues to oppose this amendment. I yield back.

Is there any further discussion on the amendment? Seeing as there is none, we now move to a vote. All those in favor of the amendment, say aye. All opposed, say no. The no's have it and the amendment is not agreed to.

The fifth amendment on the roster is an amendment offered by the gentleman from Texas. Are you ready to proceed with your amendment?

Mr. NEUGEBAUER. Yes, Mr. Chairman, I have an amendment at the desk.

Chairman LIPINSKI. The clerk will report the amendment.

The CLERK. Amendment number 008, amendment to the Committee Print offered by Mr. Neugebauer of Texas.

Chairman LIPINSKI. I ask unanimous consent to dispense with the reading. Without objection, so ordered. I recognize the gentleman for five minutes to explain the amendment.

Mr. NEUGEBAUER. Mr. Chairman, this is a very simple amendment that just maintains current policy. Currently, the Noyce scholarships are on a 50/50 match basically, and, you know, the program seeks to encourage talented science, technology, engineering and mathematics majors and professionals to become K-12 mathematics and science teachers, and that is important, but at the same token, you know, the situation that we are in right now in our budget, as I made the point earlier, is it is not like that we have extra money to help out with this program. We don't have extra money, and so we can't just transfer all of the financial woes of state and local and universities and others to the Federal Government because this is the Federal Government that doesn't have the resources currently as well, and so basically I think at this particular point in time we can show we are trying to be fiscally responsible here and we are not trying to put more and more burden on a government that doesn't have those resources. I support the importance of math and science teachers. I think we do have a program that is in place here and people are taking advantage of it, but at this particular point in time I just don't think we have the resources to decrease the match requirement on this and so I would urge my colleagues to support my amendment.

[The prepared statement of Mr. Neugebauer follows:]

PREPARED STATEMENT OF REPRESENTATIVE RANDY NEUGEBAUER

Thank you Mr. Chairman, I have an amendment at the desk.

According to the National Science Foundation, the Robert Noyce Teacher Scholarship Program seeks to encourage talented science, technology, engineering, and mathematics majors and professionals to become K-12 mathematics and science teachers.

The Noyce Scholarship Track provides funds to institutions of higher education to support scholarships, stipends, and academic programs for undergraduate STEM majors and post-baccalaureate students holding STEM degrees who earn a teaching credential and commit to teaching in high-need K–12 school districts.

Schools in my district have had the benefit of taking part in this program by working to create math clubs and math academies in

schools throughout the South Plains. While each of my colleagues here today shares a passion for further STEM education in our schools, I believe we also need continue applying economics as well.

As I have said in the past, for every \$1.00 we spend today, we have to borrow 40 cents, in fact it's gone up to 41 cents. For every dollar we spend on my district, or the Chairman's, or any member in this room, the fact is, we're getting closer and closer to having to borrow 50 percent of that money. We continue spending money we do not have.

My amendment would help to rein in this spending, by maintaining the current ratio of Federal to local spending on the Noyce Scholarship. Currently, the Federal Government requires the participating school fund 50 percent of their program, and the NSF will fund the remaining. However, before us today, is a proposal to provide 70 percent of funding to a participants' 30 percent.

There is no one on this dais that doesn't see that cities, towns, states and universities are scaling back. Yet time and time again, up here in Washington, we fail to do the same.

Its time we restore fiscal balance, while continuing to provide the appropriate resources that we can provide to continue leading in these areas.

I urge adoption of this amendment.

[Yield the balance of your time]

Chairman GORDON. Will the Chairman yield, or not yield, but may I be recognized?

Chairman LIPINSKI. The Chair recognizes Mr. Gordon.

Chairman GORDON. I understand and I am sympathetic with Mr. Neugebauer's interest here. The problem is that reducing the match from 50 to 30 doesn't save any money but it does make the money go further, and that was the original reason that we had the match in, because this 50 percent match is significantly higher than any other NSF match, but we wanted to make our money go further. By reducing it 50 to 30, as I say, doesn't save it. And this was my recommendation that we take it from 50 to 30, and let me explain why.

Again, with the best intentions, we wanted to have this 50 percent match, but then we found that the number of schools that participated was limited. It was really more elite schools. And for example, Mr. Neugebauer, your Texas Tech probably is in a better position to take advantage of 50/50 where Lubbock Christian University probably couldn't do it, and the same thing with Mr. Inglis. The University of South Carolina could probably take advantage of a 50/50 match but not the University of South Carolina at San Marcos, and the same thing with Grand Valley State University in Mr. Ehlers' district. And so we heard from a variety of what you might call, you know, smaller universities that said that they want to participate, they have good students there but the 50 percent match was beyond it. So that is the reason we took it back to 30. Again, it doesn't save any money, it just makes more institutions eligible. And I yield to Mr. Neugebauer.

Mr. NEUGEBAUER. Well, thank you, and of course, as the distinguished Chairman is aware, these schools can use in-kind as part of their match as well, but I think these are—this is a worthy program but again, I just don't know how much additional monies that we will be able to dedicate to this program.

Chairman GORDON. Reclaiming my time. The good news is, it is no additional money because reducing the match from 50 to 30 does not reduce the amount that is being, you know, allocated here.

Mr. NEUGEBAUER. Well, but if you reduce the match, then there is less funds to go to the research programs.

Chairman GORDON. Well, no, it is the same amount of money, it is just what you would accomplish is, it would spread it out further because people would be using a 50 percent match rather than a 30 percent match. In other words, if you had a dollar or if you had \$10 that was going to be spent and if it was a 50 percent match, you are going to make that go into \$15. A 30 percent match makes it go, you know, to \$13. And so you do spread the money out more, but in doing so, you limit the number of institutions that can participate, and so what we were trying to accomplish here, and again, we are on the same wavelength because this match is way above anything else at NSF, so we were trying to accomplish your goal. After three years and the response that we have gotten back from it, it seems that a better approach is to continue to spread the money by virtue of them having some skin in the game but not leave out, you know, Lubbock Christian University and others, and even though they can use their matching, you don't necessarily can get up to the full amount with matching.

Mr. NEUGEBAUER. I still don't understand how if you increase the participation of NSF to 70 percent, how you make the money—from 50 to 70, how you make the money go further.

Chairman GORDON. Well, it is a finite amount of money.

Mr. NEUGEBAUER. I mean, it looks like to me you are going to cut the participation because you are increasing—the money you are spending and you are decreasing what the university got but—

Chairman GORDON. No, it still—

Mr. NEUGEBAUER. It is a finite amount of money. I get that part. But if I am paying 50 percent—if I am in a partnership and I am paying 50 percent of the losses and then all of a sudden now I am paying 70 percent of the losses, you know, I am paying a larger portion and so maybe you and I need to sit down and walk through that with me but I don't—that is a match I am not understanding.

Chairman GORDON. Well, the good news is, there are no losses here. They are all benefits. But again, there is a finite amount of money that is in the program, X amount of money that is in the program, and so if you had 100 percent match—or rather, excuse me, if you had zero match, it would still be the same amount of money. If you had a 10 percent, 20, you know, it is the same amount of money that is in the NSF budget. The question is just how far can it be spread among various institutions.

Mr. NEUGEBAUER. I think when you go to the 70, you are saying finite amount of money but you are going to leave less money—I mean, there has got to be a shrinkage somewhere. If you decrease the match from outside and you increase your expenditure, there has got to be a decrease somewhere.

Chairman GORDON. Well, the decrease is, there will be less institutions that can participate.

Mr. NEUGEBAUER. And so is that a good—is that the right direction to go?

Chairman GORDON. I think it is—well, I mean, if all you want is the big hotshot schools doing it, then, you know, make it a 90 percent match. If you want to have Lubbock Christian, you know, schools and other regular schools to participate, you need to get it lowered. That is what we have learned from our various hearings and feedback in the program.

Chairman LIPINSKI. The Chair will recognize Dr. Ehlers.

Mr. EHLERS. Thank you, Mr. Chairman. I am not clear precisely what the objective is of this. I assume that it is because states by and large are in very difficult circumstances, and this is an attempt to allow them to get into the game with less match. But the real problem is generally not from university to university but state to state, and I don't see anything in this that provides more money for states that are on the verge of bankruptcy such as Michigan, perhaps California. I am not sure what their latest data says. But I know in Michigan we are by far the worst of the states in terms of unemployment figures, in terms of the state budget and so forth. So this effort to reduce the amount of match required or perhaps increase the federal share would be certainly welcomed in Michigan and a number of other states. If we are trying to achieve some sort of equity, then I think we should do that directly. It is not clear to me that that is going to be impact of the bill the way it is written now, and perhaps someone can clarify if I am wrong in that, but it seems to me if you are really concerned about the states not having the money, then the allocation of the funds for this should be based on the financial condition of the state that the money is going to. I would appreciate—

Chairman GORDON. If the gentleman would yield, it is not a matter of states. It is institutions. Some institutions are private. Some are state. But it is not state—well, it will be indirect state dollars. It is the institution that having to decide to what kind of priority this is. And so again, I think that it does provide incentives for those states, those institutions that are less well off because many of them can't participate at a 50/50 match and now at a 30/70 match, they will be. So I think it accomplishes yours, and again, if you want to—I mean, how do you determine what state is—if you want to do it by unemployment, do you want to do it by the amount of debt. Debt might, you know—do you want to do it—I mean I don't know what other kind of demarcation line or what other kind of way you are going to use to say who is worthy and who is not.

Mr. EHLERS. Well, frankly, it wouldn't matter in the case of Michigan. No matter what measure you use, we are still at the bottom. So I am concerned about what happens not just to the state universities but the private ones as well. Everyone gets hit by this.

Chairman GORDON. Well, the good news is, as Mr. Neugebauer pointed out earlier, they can use in-kind matches too.

Mr. EHLERS. Yes, and if we only lived in Texas, we would have lots of money, of course. Yield back.

Chairman LIPINSKI. Is there any further discussion on the amendment?

Mr. NEUGEBAUER. I don't have any more time.

Chairman LIPINSKI. Mr. Neugebauer?

Mr. NEUGEBAUER. If I could get somebody to yield me. You know, I have to go back. I am a visual learner, but let us just use a pro-

gram here and we have got \$10 for these grants, okay? And so we are doing two grants right now. We are doing \$5 each one of those. That is the matching part and so the other partner has to come up with \$5. So that is \$10. So now we go to 70/30. Now we are going to put in \$7 and that person that was putting in \$5 before now puts in \$3 and now the other person that is getting the grant, we only have \$3 to match with that and so that grant basically falls out unless they can come up with the—so that puts that person coming up with the \$7 match for \$3. See, I think this shrinks the program, and that is the match that I am looking at.

Chairman GORDON. If the gentleman would yield, I mean, once again, there is about \$50 million that goes into this program and so whether it is a 10 percent match, a 90 percent match, it doesn't matter what the match is, there are no more federal dollars going into the program. As I mentioned earlier, the bigger the match, the more you can spread it across the country. The question is again, do you want it all going to Texas Tech or do you want Lubbock Christian University to be able to—

Mr. NEUGEBAUER. See, I think the more the match, you reduce the number of grants that you are going to be able to do. That is the analogy that I just used. And, you know, the other thing is, I haven't heard from Texas Tech nor Lubbock Christian University that this is an issue for them. So I am just wondering if we are addressing a problem we don't have. But secondly, that is going to diminish if you have to match more on a per-grant basis. Somebody else is going to either be left out or lose a grant because you are increasing the match on some of these other ones.

Chairman GORDON. If the gentleman would yield? But there will be no more federal dollars spent.

Mr. NEUGEBAUER. That is not the point. The point here is that we are going to diminish how many people are going to be able to participate in the program, and because we are going to pay more and there is going to be less dollars for other grants.

Chairman GORDON. Well, if the gentleman would yield, the way it works, again, there is \$50 million. You know, an institution may get a—or let us just say they have got a \$1,220 grant. Well, it just means you can give the same number of \$1,000 grants out. The difference is that the university will be putting up \$300 or 30 percent rather than 50 percent, so you can still do the same number of grants.

Mr. NEUGEBAUER. No, because you were given 100 and now they are changing the ratio so you are going to have to come up with—

Chairman GORDON. No, that is the university. So again, the NSF can give the same number of grants. It is just that the universities will be putting up less money. So again, if you were going to do \$1,000 grants, you can still do that.

Mr. NEUGEBAUER. If the university has got \$100,000, I understand that, they may be able to get more grants but we will have less capacity because we have increased the amount of—

Chairman GORDON. No, the only—if there is a “lesser” in any of this, the lesser is that the university is putting up less money and so maybe they can cover less students there. But it doesn't reduce the amount of—there is a finite number in the budget for this so it doesn't reduce the budget deficit at all. It doesn't reduce the

amount that schools can participate. It is just going to reduce the amount that they put in. So again, if it \$100,000 that you are putting into a university, and they have to do a \$30,000 match, then you will have \$130,000 for the university to deal with there. If it is a \$50,000 match, then they have \$150,000. But that is on the university level. No less grants, no less federal dollars being spent.

Chairman LIPINSKI. The Chair recognizes Dr. Baird.

Mr. BAIRD. I am not sure it is worth dragging this out too much longer but the fundamental issue I think the Chairman is getting at, which actually I am sympathetic to and I have heard from some of my universities on, is there are some universities that have big endowments, large budgets, et cetera, and they come from states that are well funded and there are others that are less so and yet the merits of offering this opportunity to people should not be based on whether or not they are fortunate enough to go to the well-funded universities. It should be based on their merit and the need to train this body of research. The Chairman's point is one I have heard from some of my universities, is that the match makes it prohibitively expensive for certain universities and not for others, and then you will concentrate that federal dollar. So it is not necessarily—I think the debate is not necessarily, are you getting more people into the program. I think that is what Mr. Neugebauer is raising the question on, and I think Mr. Gordon is saying, are you getting more institutions into the question, and I think the latter is the goal, as I understand it, of this amendment and it is certainly what I have heard from my institutions. And so I am not sure, I won't venture into the waters of this 'more people' argument but I think the 'more institutions' argument does have merit and that I think would be the net impact of the Chairman's amendment. I have actually heard from some of my institutions that they would appreciate that. I yield back.

Chairman LIPINSKI. Any further discussion? If no, the vote will occur on the amendment. All in favor, say aye. Those opposed, no. The no's have it. The amendment is not agreed to.

The sixth amendment on the roster is an amendment offered by the gentlelady from Texas, Ms. Johnson. Are you ready to proceed with your amendment?

Ms. JOHNSON. Thank you, Mr. Chairman. I do have an amendment at the desk.

Chairman LIPINSKI. The clerk will report the amendment.

The CLERK. Amendment number 100, amendment to the Committee Print offered by Ms. Eddie Bernice Johnson of Texas.

Chairman LIPINSKI. I ask unanimous consent to dispense with the reading. Without objection, so ordered. I recognize the gentlelady for five minutes to explain the amendment.

Ms. JOHNSON. Thank you, Mr. Chairman.

My amendment addresses the National Science Foundation's proposal in the fiscal year 2011 budget to consolidate the Historically Black Colleges and Universities Undergraduate program, the Tribal Colleges and Universities program and the Louis Stokes Alliances for Minority Participation program into a single undergraduate broadening participation program. I am concerned that the effectiveness of the individual programs and their ability to serve the unique needs of the different types of minority-serving in-

stitutions and underrepresented groups will be lost under a single umbrella program. Therefore, my amendment prohibits the National Science Foundation from moving forward with the consolidation program in 2011 and requires the development of a detailed plan clarifying the objectives and rationale for such a consolidation. My amendment requires that input from the relevant stakeholders including minority-serving institutions are considered in the development of any consolidated program. The process for the inclusion and development of the consolidated program in fiscal year 2011 budget was not transparent. As my colleagues know, in order for any program to be successful, it needs a buy-in from the stakeholder community.

Additionally, the National Science Foundation must consider the forthcoming recommendations from the National Academies' study on expanding the STEM workforce to include more underrepresented minorities than we we required in the 2007 COMPETES Act. In order to maintain the competitiveness of our Nation, we need to produce more scientists and engineers to fill the growing number of technical jobs but we will find it much more difficult to develop the well-trained STEM workforce we need if we continue to overlook significant portions of the talent pool. We need to do a better job of developing all of the STEM talent the Nation has to offer, especially in light of the changing demographics of our Nation.

According to the Bureau of Labor Statistics, the percentage of the college population that is currently represented by minorities will grow to 55 percent in 2050. If we are to ensure an adequate STEM workforce, we need to increase the number of minority students pursuing and obtaining STEM degrees. I am committed to ensuring that the National Science Foundation's broadening participation programs are effective, and if we should alter the successful individual programs, we need to develop a well-thought-out plan.

I am also committed to ensuring the COMPETES Act places proper emphasis on embracing the broader participation of U.S. citizens in science, technology, engineering and math. To do this, we must be proactive. In anticipation for a final markup of this legislation, I look forward to reviewing policy recommendations for COMPETES from my colleagues and including the Congressional Black Caucus. I will not vote for a bill that does not appropriately address minority participation in STEM and I would advise my CBC colleagues to vote against it as well.

I have an additional statement for the record regarding Section 304 of the Committee Print, and I would like to submit it for the record.

[The prepared statement of Ms. Johnson follows:]

PREPARED STATEMENT OF REPRESENTATIVE EDDIE BERNICE JOHNSON

Mr. Chairman, I have an amendment at the desk.

Thank you Chairman Lipinski and Ranking Member Ehlers.

Mr. Chairman, my amendment addresses NSF's proposal in the FY 2011 budget to consolidate the Historically Black Colleges and Universities-Undergraduate Program, the Tribal Colleges and Universities Program, and the Louis Stokes Alliances for Minority Participation program into a single undergraduate broadening participation program.

I am concerned that the effectiveness of the individual programs and their ability to serve the unique needs of the different types of minority serving institutions and underrepresented groups will be lost under a single umbrella program.

Therefore, my amendment prohibits NSF from moving forward with the consolidated program in FY 2011 and requires the development of detailed plan clarifying the objectives and rationale for such a consolidation.

My amendment requires that input from the relevant stakeholders, including minority serving institutions, are considered in the development of any consolidated program. The process for the inclusion and development of the consolidated program in the FY 2011 budget was not transparent. As my colleagues know, in order for any program to be successful it needs buy-in from the stakeholder community.

Additionally, NSF must consider the forthcoming recommendations from the National Academies' study on expanding the STEM workforce to include more underrepresented minorities that we required in the 2007 COMPETES Act.

In order to maintain the competitiveness of our Nation we need to produce more scientists and engineers to fill the growing number of technical jobs. But we will find it much more difficult to develop the well-trained STEM workforce we need if we continue to overlook significant portions of the talent pool.

We need to do a better job of developing ALL of the STEM talent the Nation has to offer, especially in light of the changing demographics of our Nation. According to the Bureau of Labor Statistics the percent of the college population that is currently represented by minorities will grow to 55 percent by 2050. If we are to ensure an adequate STEM workforce we need to increase the number of minority students pursuing and attaining STEM degrees.

I am committed to ensuring that NSF's broadening participation programs are effective and if we should alter these successful individual programs we need to develop well-thought out plan.

I also am committed to ensuring the COMPETES Act places proper emphasis on embracing the broader participation of U.S. citizens in Science, Technology, Engineering, and Mathematics. To do this, we must be proactive. In anticipation for a final markup of this legislation I look forward to reviewing policy recommendations for COMPETES from my colleagues on the Congressional Black Caucus.

I will not vote for a bill that does not appropriately address minority participation in STEM and I would advise my CBC colleagues to vote against it too.

I have an additional statement for the record regarding section 304 of the committee print and I would like to submit it for the record.

Thank you, Mr. Chairman. I yield back the remainder of my time.

[The prepared statement of Ms. Johnson follows:]

STATEMENT FOR THE RECORD SUBMITTED BY REPRESENTATIVE EDDIE BERNICE JOHNSON

For eighteen years as a Member of the committee on Science and Technology, I have attended hearings dealing with minority participation. I have been to these hearings where recommendations were made for NSF to rapidly increase the number of undergraduate and graduate scholarships to persons from underrepresented groups in STEM. I have heard advice from our Nation's top experts in academia calling for active recruitment, mentoring, and community building. I do not see those recommendations in this bill. I see a few small additions here or there, however, there is no comprehensive section on minority participation.

Additionally, a provision exists in this bill that labels schools that serve disabled as Minority Serving Institutions (MSI). Arguing that an institution for the disabled should be a minority serving institution is in effect creating a catch-all category that ignores the individualized needs of these institutions. These institutions do not serve the same populations. They each have their own strengths and weaknesses.

The Committee on Equal Opportunities in Science and Engineering recommends in its 2007-2008 Biennial Report to Congress that "institutions such as Gallaudet, National Technical Institute for the Deaf, Landmark College, and others should have a designation *similar* to Minority Serving Institutions (MSI)." I fully support education for the disabled and believe we should have a category designated specifically for the needs of those institutions.

Moreover, I do like the tone of this bill and I do not like the tone of NSF. We cannot simply throw all minorities and their programs into one giant category. Our nation's HBCUs were founded for the purpose of educating African Americans prior to the desegregation era. This is written in their mission statement. For decades these institutions were deprived the funding and resources of their counter parts.

Historically Black Colleges and Universities graduate students in STEM degrees at a higher rate than most traditional universities and currently are conducting world-class research in AIDS and Cancer research. I will not allow these institutions, which are gems of our society to be weakened. We must do what we can to help and protect minority serving institutions.

If we are dedicated to promoting and graduating minority scientists we must address the needs of these institutions. This measure takes away from their funding by creating a bigger pool with institutions that have completely different needs. Additionally, the statute dilutes what is considered a minority serving institution and creates a dangerous precedent.

NSF is required to report to congress what they are doing to reach out to minorities. They ignore this requirement. I want this report. NSF also should listen to CEOSE recommendations and "consider conducting a comprehensive review of impact evaluation findings on its broadening participation programs, use the review to determine and document what works and what does not."

We have an obligation to the future of our Nation to assure every segment of our population has equal access and opportunity to pursue careers in STEM. As Coretta Scott King once said, "Struggle is a never-ending process. Freedom is never really won. You earn it and win it in every generation." The America COMPETES Reauthorization should be used as a vehicle toward achieving parity in the sciences for women and underrepresented minorities.

As this committee heads toward a final markup, I will not vote for a bill that does not appropriately address minority participation in STEM and I would advise my CBC colleagues to vote against it too.

This is America COMPETES, and it must include all Americans. Different Americans and different institutions have separate needs. This bill ignores that.

Chairman LIPINSKI. Without objection, so ordered.

Ms. JOHNSON. Thank you, Mr. Chairman. I yield back the remainder of my time.

Chairman LIPINSKI. The Chair recognizes Dr. Ehlers.

Mr. EHLERS. Thank you, Mr. Chairman, and I thank my colleague for offering this amendment. I must confess, when we were holding the hearings in this subcommittee and I raised an issue about the same—I raised the same issue and asked for justification for the recommendation, I was not convinced that they had thoroughly considered the issue and I think I apparently left the meeting with the same feelings that my colleague from Texas has on this issue, that they just hadn't thought it through as fully as they might have. So I support the amendment and I would like to see in writing the justification for the plan and just exactly how it would work.

I am not necessarily opposed to what the Director is recommending, but I didn't think we were given enough information, and Ms. Johnson's amendment would take care of that and give us the information we need to make a valid judgment. Yield back.

Chairman LIPINSKI. Any further discussion on the amendment? The Chair recognizes himself.

Again, I want to thank Ms. Johnson for her work on this issue. I think there may be some value in leveraging the common objectives and successful components of the individual programs but the process for the formation of the consolidated program was not transparent and I cannot be supportive of consolidation without sufficient detail about how the program will be administered. We need to increase the number of individuals from underrepresented groups who are pursuing STEM degrees. We all agree to that. We need to do this through a thorough, effective program. I look forward to seeing a more detailed and more broadly supported plan from the Foundation next year. I urge my colleagues to support this amendment.

Is there any further discussion on the amendment? If not, we will have a vote on the amendment. All those in favor, say aye. Opposed, no. The ayes have it and the amendment is agreed to.

Chairman LIPINSKI. The seventh amendment on the roster is an amendment offered by the gentlelady from Ohio. Are you ready to proceed with your amendment?

Ms. FUDGE. Yes, Mr. Chairman, I have an amendment at the desk.

Chairman LIPINSKI. The clerk will report the amendment.

The CLERK. Amendment number 059, amendment to the Committee Print offered by Ms. Fudge of Ohio.

Chairman LIPINSKI. I ask unanimous consent to dispense with the reading. Without objection, so ordered. I recognize the gentlelady for five minutes to explain the amendment.

Ms. FUDGE. Thank you, Mr. Chairman.

Mr. Chairman, my amendment to the Committee Print of the *National Science Foundation Authorization Act of 2010* seeks to improve the state of research on preK–12 STEM education. It requires the NSF and the Department of Education to work together to identify grand challenges in education research. It also requires them to determine their respective roles in funding this crucial research and in disseminating the results of this research to teachers and other education practitioners.

One of the most common complaints we hear from stakeholders in the STEM education community is that research on the teaching and learning of STEM education is too siloed. It does not always look at some of the big questions that, if answered, have the greatest potential for improving preK–12 STEM education. The NSF and the Department of Education both invest in STEM education research and each brings its own mission and own strengths to this purpose. However, there is merit in having the two agencies collaborate in identifying grand challenges in education research, and them determining what specific roles each of these two agencies should play in addressing those grand challenges. We all know that in order to effectively reform STEM education, it is necessary to apply the latest research findings on how students learn. Though we may know a great deal on how individual subsections of our society are best taught, critical gaps in education research remain. Collaboration is essential to fill these gaps.

Specifically, this amendment instructs the Secretary of Education and Director of the NSF to consider six key research topics: the scalability, sustainability and replication of successful STEM activities, the challenges and opportunities to improve the teaching and learning of STEM, the characteristics of effective STEM teachers and STEM teacher professional development programs, how cyber-enabled tools and programs influence learning and teaching in STEM, STEM teaching and learning in informal environments, and how integrating engineering with mathematics and science education may improve learning of math and science, increase student increase and persistence in STEM, or improve student understanding of engineering designs, principles and of the built world.

It is critical that the research we are funding speaks to the needs of teachers and students across all parts of the country. For that reason, this amendment instructs the NSF and the Department

of Education to solicit input from a variety of stakeholders throughout this process. By enabling stakeholders to inform the NSF and the Department of Education on the needs of the STEM community, we will ensure that the research performed is relevant and useful.

The legislation also requires that the agencies provide a report to Congress with a description of the grand challenges they have identified, the respective role of each agency in addressing them, the common metrics that will be used to evaluate progress towards meeting these goals and most importantly, how the agencies will disseminate their research results to practitioners and other federal and non-federal funders of STEM education. This is an important element of the legislation, since research findings and best practices will be of no use if they do not make their way into the hands of those teaching our Nation's students.

This is an important amendment and one that will ensure that our tax dollars are funding the most relevant and useful STEM education research, and I urge my colleagues to support it. Mr. Chairman, I yield back.

[The prepared statement of Ms. Fudge follows:]

PREPARED STATEMENT OF REPRESENTATIVE MARCIA L. FUDGE

My amendment to the Committee Print of the National Science Foundation Authorization Act of 2010 seeks to improve the state of research on preK–12 STEM education. It requires the NSF and the Department of Education to work *together* to identify grand challenges in education research. It also requires them to determine their respective roles in funding this crucial research and in disseminating the results of this research to teachers and other education practitioners.

One of the most common complaints we hear from stakeholders in the STEM education community is that research on the teaching and learning of STEM education is too siloed. It does not always look at some of the big questions that, if answered, have the greatest potential for improving preK–12 STEM education. The NSF and the Department of Education both invest in STEM education research, and each brings its own mission and own strengths to this purpose. However, there is merit in having the two agencies collaborate in identifying grand challenges in education research, and then determining what specific role each of these two agencies should play in addressing those grand challenges.

We all know that in order to effectively reform STEM education, it is necessary to apply the latest research findings on how students learn. Though we may know a great deal on how individual subsections of our society are best taught, critical gaps in education research remain. Collaboration is essential to fill these gaps.

Specifically, this amendment instructs the Secretary of Education and Director of the NSF to consider six key research topics:

- the scalability, sustainability, and replication of successful STEM activities,
- the challenges and opportunities to improve the teaching and learning of STEM,
- the characteristics of effective STEM teachers and STEM teacher professional development programs,
- how cyber-enabled tools and programs influence learning and teaching in STEM
- STEM teaching and learning in informal environments, and
- how integrating engineering with mathematics and science education may: improve learning of math and science, increase student interest and persistence in STEM, or improve student understanding of engineering design principles and of the built world.

It is crucial that the research we are funding speaks to the needs of teachers and students across all parts of the country. For that reason, this amendment instructs the NSF and the Department of Education to solicit input from a variety of stakeholders throughout this process. By enabling stakeholders to inform the NSF and

Department of Education on the needs of the STEM community, we will ensure that the research performed is relevant and useful.

The legislation also requires that the agencies provide a report to Congress with a description of the grand challenges they have identified, the respective role of each agency in addressing them, the common metrics that will be used to evaluate progress toward meeting those goals, and most importantly, how the agencies will disseminate their research results to practitioners and other Federal and non-federal funders of STEM education. This is an important element of the legislation, since research findings and best practices will be of no use if they do not make their way into the hands of those teaching our Nation's students.

This is an important amendment and one that will ensure that our tax dollars are finding the most relevant and useful STEM education research, and I urge my colleagues to support it.

Chairman LIPINSKI. The Chair recognizes Dr. Ehlers.

Mr. EHLERS. Thank you, Mr. Chairman, and I commend my colleague from Ohio for the amendment. I can't judge based on what I have heard whether all of my concerns will be addressed, but I certainly support her amendment and I would like to have some discussions with her before the final markup.

Let me say as an example, some of the best research done on learning about how children learn has been done in the National Institutes of Health, and clearly that research has to be studied by the Department of Education and the NSF, but I am not sure they have the capability to really examine that, and perhaps we need more people at the table. I was struck some years ago when we were working on these issues, and I have spent 30 years of my pre-Congress life working on STEM education, about 10 years while here, and it is a very complex issue with a lot of different participants, and I really think we have to have—well, the example I was going to use, there was someone at the Department of Education who was put in charge of this and they had a meeting every other week, and at the end of the study that was going on, and it was very informal and I attended a number of them. I was amazed, we got 80 participants attending from about seven or eight departments. There is a huge interest in this topic. And so if the gentlelady is willing to discuss this with me between now and our next hearing on this, the Full Committee hearing, we may be able to come to an understanding of how broadly this has to be done or how it has to be managed so that all these different ideas are fairly represented in the work that is done by NSF and the Department of Education.

Ms. FUDGE. Will the gentleman yield?

Mr. EHLERS. Yes.

Ms. FUDGE. I would be happy to, Mr. Ehlers.

Mr. EHLERS. Thank you very much.

Chairman LIPINSKI. Any further discussion on the amendment? The Chair will recognize himself.

I want to thank Ms. Fudge for this amendment. This is certainly an issue that we heard about in hearings, I heard in listening sessions that I have held. Just last week in Chicago this exact issue was brought up about having a good education research portfolio on STEM education, how to effectively scale up and replicate successful models. We know that they are out there. I think more should be done in order to make sure that these do get around and we do as much as we can to improve STEM education, so I thank Ms. Fudge for her amendment and I will support the amendment.

Is there any further discussion? If no, a vote will occur on the amendment. All in favor, say aye. All opposed, say no. The ayes have it and the amendment is agreed to.

The eighth amendment on the roster is an amendment offered by the gentleman from New York. Are you ready to proceed with your amendment?

Mr. TONKO. Yes, I am, Mr. Chair. I have an amendment at the desk.

Chairman LIPINSKI. The clerk will report the amendment.

The CLERK. Amendment number 025, amendment to the Committee Print offered by Mr. Tonko of New York.

Chairman LIPINSKI. I ask unanimous consent to dispense with the reading. Without objection, so ordered. I recognize the gentleman for five minutes to explain the amendment.

Mr. TONKO. Thank you, Mr. Chair.

This amendment seeks to improve opportunities for undergraduate students to participate in hands-on scientific research. There is significant attrition in many of the STEM fields, particularly during the undergraduate years, and it is therefore critical that we find ways to increase student interest and student achievement in STEM throughout college.

In February, this subcommittee held a hearing on the need to strengthen undergraduate and graduate STEM education. In that hearing, we heard repeatedly of the important role that research experiences can play in contributing to the quality of the undergraduate experience. Research experiences can provide a context in what students are being taught in the classroom and can give them a better understanding of what it means to be a scientist or what it means to be an engineer. However, many undergraduate students simply do not have the opportunity to participate in hands-on research.

This amendment requires the Director of NSF to award grants to colleges, universities or nonprofits to establish sites that will provide research experiences to undergrad STEM students. These research experiences for undergraduate, or REU sites, are required to serve at least 10 undergraduate students with at least half of the students coming from colleges or universities where such research opportunities are limited. The amendment also requires that students participating in an REU site program have mentors to help encourage them throughout the research experience and beyond.

This amendment also requires NSF to change its policy for including undergraduate students in standard Foundation research grants. Rather than applying for supplemental funding to include undergraduates in NSF-funded research, this amendment would encourage researchers to integrate undergraduate students into their research projects from the very beginning. This ensures the student is fully integrated into that research team while also providing the researcher with the workforce needed to carry out her or his research.

This amendment helps provide valuable research experiences to undergraduate students and therefore I urge my colleagues to support the amendment. Thank you.

[The prepared statement of Mr. Tonko follows:]

PREPARED STATEMENT OF REPRESENTATIVE PAUL D. TONKO

This amendment seeks to improve opportunities for undergraduate students to participate in hands-on scientific research.

There is significant attrition in many of the STEM fields, particularly during the undergraduate years, and it is critical that we find ways to increase student interest and achievement in STEM throughout college.

In February our Subcommittee held a hearing on the need to strengthen undergraduate and graduate STEM education. In that hearing, we heard repeatedly of the important role research experiences can play in contributing to the quality of the undergraduate experience. Research experiences can provide a context to what the student is being taught in the classroom and can give them a better understanding of what it means to be a scientist or engineer. However, many undergraduate students do not have the opportunity to participate in hands-on research.

This amendment requires the Director of NSF to award grants to colleges, universities, or non-profits to establish sites that will provide research experiences to undergraduate STEM students. These Research Experiences for Undergraduate (REU) sites are required to serve at least ten undergraduate students, with at least half of the students coming from colleges or universities where such research opportunities are limited. The amendment also requires that students participating in a REU sites program have mentors to help encourage them throughout their research experience and beyond.

This amendment also requires NSF to change their policy for including undergraduate students in standard Foundation research grants. Rather than applying for supplemental funding to include undergraduates in NSF-funded research, this amendment would encourage researchers to integrate undergraduate students into their research projects from the beginning. This ensures the student is fully integrated into the research team, while also providing the researcher with the workforce needed to carry out his or her research.

This amendment helps provide valuable research experiences to undergraduate students and I urge my colleagues to support it.

Chairman LIPINSKI. Thank you, Mr. Tonko.

Is there further discussion? Dr. Ehlers.

Mr. EHLERS. Thank you, Mr. Chairman, another good amendment, and I am happy to support it. It is very useful. I taught at a small college and we had a program exactly like this, and it literally changed the life of the students to be able to participate with professors in very important research programs right from the start. Yield back.

Chairman LIPINSKI. Any further discussion?

Mr. BAIRD. I just want to commend the author of this. Last evening Dr. Ehlers and I and maybe some additional colleagues were fortunate enough to attend the Council for Undergraduate Research reception where they had poster sessions from all sorts of different projects, really brilliant young people from around the country, many of them actually from community colleges and other institutions where undergraduate research is not usually accessible, but that is what catapults these young people into careers, and I share Dr. Ehlers' commendation of our friend, Mr. Tonko, for his leadership in this, and I am sure there will be people around this country, young people who will benefit from this. I commend you for your initiative.

Mr. EHLERS. Will the gentleman yield? I would also like to commend Dr. Baird for the award he received at that particular event. Congratulations.

Chairman LIPINSKI. Any further discussion on the amendment? I would like to thank Mr. Tonko for his amendment. As Dr. Ehlers and Dr. Baird said, we all know, we have had our own experiences, we have certainly heard from a lot of people how critical it is to have these types of experiences and they are not often available.

The more we can make them available, the better off we certainly will be in the STEM fields.

So if there is no further discussion, we will have a vote on the amendment. All those in favor, say aye. Opposed, no. The ayes have it and the amendment is agreed to.

Are there any other amendments? If no, then the vote is on the Committee Print as amended. All those in favor will say aye. All those opposed will say no. In the opinion of the Chair, the ayes have it.

I now recognize myself to offer a motion. I move that the Subcommittee favorably report the Committee Print, as amended, to the Full Committee. Furthermore, I move that staff be instructed to prepare the Subcommittee Report and make necessary technical and conforming changes to the Print in accordance with the recommendations of the Subcommittee.

The question is on the motion to report the Print favorably. Those in favor of the motion will signify by saying aye. Opposed, no. The ayes have it and the print is favorably reported.

Without objection, the motion to reconsider is laid upon the table. Members will have two subsequent calendar days in which to submit supplemental minority or additional views on the measure.

I want to thank all the Members for their attendance and participation at today's markup, and this concludes today's Subcommittee markup.

[Whereupon, at 11:50 a.m., the Subcommittee was adjourned.]

Appendix:

COMMITTEE PRINT, SECTION-BY-SECTION ANALYSIS, AMENDMENT
ROSTER

[COMMITTEE PRINT]

APRIL 9, 2010

111TH CONGRESS
2D SESSION

H. R. _____

To authorize appropriations for fiscal years 2011 through 2015 for the National Science Foundation, and for other purposes.

IN THE HOUSE OF REPRESENTATIVES

M. _____ introduced the following bill; which was referred to the Committee on _____

A BILL

To authorize appropriations for fiscal years 2011 through 2015 for the National Science Foundation, and for other purposes.

1 *Be it enacted by the Senate and House of Representa-*
2 *tives of the United States of America in Congress assembled,*

3 **SECTION 1. SHORT TITLE; TABLE OF CONTENTS.**

4 (a) **SHORT TITLE.**—This Act may be cited as the
5 “National Science Foundation Authorization Act of
6 2010”.

1 (b) TABLE OF CONTENTS.—The table of contents for
2 this Act is as follows:

Sec. 1. Short title; table of contents.

TITLE I—GENERAL PROVISIONS

Sec. 101. Definitions.

Sec. 102. Authorization of appropriations.

Sec. 103. National Science Board administrative amendments.

Sec. 104. Broader impacts review criterion.

TITLE II—RESEARCH AND INNOVATION

Sec. 201. Support for potentially transformative research.

Sec. 202. Facilitating interdisciplinary collaborations for national needs.

Sec. 203. National Science Foundation manufacturing research.

Sec. 204. Strengthening institutional research partnerships.

Sec. 205. National Science Board report on mid-scale instrumentation.

Sec. 206. Sense of Congress on overall support for research infrastructure at the Foundation.

TITLE III—STEM EDUCATION AND WORKFORCE TRAINING

Sec. 301. Graduate student support.

Sec. 302. Postdoctoral fellowship in STEM education research.

Sec. 303. Robert Noyce teacher scholarship program.

Sec. 304. Institutions serving persons with disabilities.

Sec. 305. Institutional integration.

Sec. 306. Postdoctoral research fellowships.

Sec. 307. Broadening participation training and outreach.

3 **TITLE I—GENERAL PROVISIONS**

4 **SEC. 101. DEFINITIONS.**

5 In this Act:

6 (1) **DIRECTOR.**—The term “Director” means
7 the Director of the National Science Foundation es-
8 tablished under section 2 of the National Science
9 Foundation Act of 1950 (42 U.S.C. 1861).

10 (2) **FOUNDATION.**—The term “Foundation”
11 means the National Science Foundation established
12 under section 2 of the National Science Foundation
13 Act of 1950 (42 U.S.C. 1861).

1 (3) INSTITUTION OF HIGHER EDUCATION.—The
2 term “institution of higher education” has the
3 meaning given such term in section 101(a) of the
4 Higher Education Act of 1965 (20 U.S.C. 1001(a)).

5 (4) STATE.—The term “State” means one of
6 the several States, the District of Columbia, the
7 Commonwealth of Puerto Rico, the Virgin Islands,
8 Guam, American Samoa, the Commonwealth of the
9 Northern Mariana Islands, or any other territory or
10 possession of the United States.

11 (5) STEM.—The term “STEM” means science,
12 technology, engineering, and mathematics.

13 (6) UNITED STATES.—The term “United
14 States” means the several States, the District of Co-
15 lumbia, the Commonwealth of Puerto Rico, the Vir-
16 gin Islands, Guam, American Samoa, the Common-
17 wealth of the Northern Mariana Islands, and any
18 other territory or possession of the United States.

19 **SEC. 102. AUTHORIZATION OF APPROPRIATIONS.**

20 (a) FISCAL YEAR 2011.—

21 (1) IN GENERAL.—There are authorized to be
22 appropriated to the Foundation \$8,219,670,000 for
23 fiscal year 2011.

24 (2) SPECIFIC ALLOCATIONS.—Of the amount
25 authorized under paragraph (1)—

1 (A) \$6,600,000,000 shall be made avail-
2 able for research and related activities;

3 (B) \$1,104,000,000 shall be made avail-
4 able for education and human resources;

5 (C) \$166,000,000 shall be made available
6 for major research equipment and facilities con-
7 struction;

8 (D) \$330,000,000 shall be made available
9 for agency operations and award management;

10 (E) \$4,840,000 shall be made available for
11 the Office of the National Science Board; and

12 (F) \$14,830,000 shall be made available
13 for the Office of Inspector General.

14 (b) FISCAL YEAR 2012.—

15 (1) IN GENERAL.—There are authorized to be
16 appropriated to the Foundation \$8,932,080,000 for
17 fiscal year 2012.

18 (2) SPECIFIC ALLOCATIONS.—Of the amount
19 authorized under paragraph (1)—

20 (A) \$7,128,000,000 shall be made avail-
21 able for research and related activities;

22 (B) \$1,192,320,000 shall be made avail-
23 able for education and human resources;

1 (C) \$235,000,000 shall be made available
2 for major research equipment and facilities con-
3 struction;

4 (D) \$356,400,000 shall be made available
5 for agency operations and award management;

6 (E) \$5,010,000 shall be made available for
7 the Office of the National Science Board; and

8 (F) \$15,350,000 shall be made available
9 for the Office of Inspector General.

10 (c) FISCAL YEAR 2013.—

11 (1) IN GENERAL.—There are authorized to be
12 appropriated to the Foundation \$9,555,160,000 for
13 fiscal year 2013.

14 (2) SPECIFIC ALLOCATIONS.—Of the amount
15 authorized under paragraph (1)—

16 (A) \$7,626,960,000 shall be made avail-
17 able for research and related activities;

18 (B) \$1,275,780,000 shall be made avail-
19 able for education and human resources;

20 (C) \$250,000,000 shall be made available
21 for major research equipment and facilities con-
22 struction;

23 (D) \$381,350,000 shall be made available
24 for agency operations and award management;

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1 (E) \$5,180,000 shall be made available for
2 the Office of the National Science Board; and

3 (F) \$15,890,000 shall be made available
4 for the Office of Inspector General.

5 (d) FISCAL YEAR 2014.—

6 (1) IN GENERAL.—There are authorized to be
7 appropriated to the Foundation \$10,112,940,000 for
8 fiscal year 2014.

9 (2) SPECIFIC ALLOCATIONS.—Of the amount
10 authorized under paragraph (1)—

11 (A) \$8,084,580,000 shall be made avail-
12 able for research and related activities;

13 (B) \$1,352,330,000 shall be made avail-
14 able for education and human resources;

15 (C) \$250,000,000 shall be made available
16 for major research equipment and facilities con-
17 struction;

18 (D) \$404,230,000 shall be made available
19 for agency operations and award management;

20 (E) \$5,370,000 shall be made available for
21 the Office of the National Science Board; and

22 (F) \$16,440,000 shall be made available
23 for the Office of Inspector General.

24 (e) FISCAL YEAR 2015.—

1 (1) IN GENERAL.—There are authorized to be
2 appropriated to the Foundation \$10,704,180,000 for
3 fiscal year 2015.

4 (2) SPECIFIC ALLOCATIONS.—Of the amount
5 authorized under paragraph (1)—

6 (A) \$8,569,650,000 shall be made avail-
7 able for research and related activities;

8 (B) \$1,433,470,000 shall be made avail-
9 able for education and human resources;

10 (C) \$250,000,000 shall be made available
11 for major research equipment and facilities con-
12 struction;

13 (D) \$428,480,000 shall be made available
14 for agency operations and award management;

15 (E) \$5,550,000 shall be made available for
16 the Office of the National Science Board; and

17 (F) \$17,020,000 shall be made available
18 for the Office of Inspector General.

19 **SEC. 103. NATIONAL SCIENCE BOARD ADMINISTRATIVE**
20 **AMENDMENTS.**

21 (a) STAFFING AT THE NATIONAL SCIENCE BOARD.—
22 Section 4(g) of the National Science Foundation Act of
23 1950 (42 U.S.C. 1863(g)) is amended by striking “not
24 more than 5”.

1 (b) SCIENCE AND ENGINEERING INDICATORS DUE
2 DATE.—Section 4(j)(1) of the National Science Founda-
3 tion Act of 1950 (42 U.S.C. 1863(j)(1)) is amended by
4 striking “January 15” and inserting “May 31”.

5 (c) NATIONAL SCIENCE BOARD REPORTS.—Section
6 4(j)(2) of the National Science Foundation Act of 1950
7 (42 U.S.C. 1863(j)(2)) is amended by inserting “within
8 the authority of the Foundation (or otherwise as requested
9 by the Congress or the President)” after “individual policy
10 matters”.

11 (d) BOARD ADHERENCE TO SUNSHINE ACT.—Sec-
12 tion 15(a) of the National Science Foundation Authoriza-
13 tion Act of 2002 (42 U.S.C. 1862n-5(a)) is amended—

14 (1) by striking paragraph (3) and redesignating
15 paragraphs (4) and (5) as paragraphs (3) and (4),
16 respectively;

17 (2) in paragraph (3), as so redesignated by
18 paragraph (1) of this subsection—

19 (A) by striking “February 15” and insert-
20 ing “April 15”; and

21 (B) by striking “audit required under
22 paragraph (3) along with”; and

23 (3) in paragraph (4), as so redesignated by
24 paragraph (1) of this subsection, by striking “To fa-

1 cilitate the audit required under paragraph (3) of
2 this subsection, the” and inserting “The”.

3 **SEC. 104. BROADER IMPACTS REVIEW CRITERION.**

4 (a) GOALS.—The Foundation shall apply a Broader
5 Impacts Review Criterion to achieve the following goals:

6 (1) Increased economic competitiveness of the
7 United States.

8 (2) Development of a globally competitive
9 STEM workforce.

10 (3) Increased participation of women and
11 underrepresented minorities in STEM.

12 (4) Increased partnerships between academia
13 and industry.

14 (5) Improved K-12 STEM education and teach-
15 er development.

16 (6) Improved undergraduate STEM education.

17 (7) Increased public scientific literacy.

18 (8) Increased national security.

19 (b) POLICY.—Not later than 6 months after the date
20 of enactment of this Act, the Director shall develop and
21 implement a policy for the Broader Impacts Review Cri-
22 terion that—

23 (1) provides for educating professional staff at
24 the Foundation, merit review panels, and applicants

1 for Foundation research grants on the policy devel-
2 oped under this subsection;

3 (2) clarifies that the activities of grant recipi-
4 ents undertaken to satisfy the Broader Impacts Re-
5 view Criterion shall—

6 (A) to the extent practicable employ proven
7 strategies and models and draw on existing pro-
8 grams and activities; and

9 (B) when novel approaches are justified,
10 build on the most current research results;

11 (3) allows for some portion of funds allocated to
12 broader impacts under a research grant to be used
13 for assessment and evaluation of the broader im-
14 pacts activity;

15 (4) encourages institutions of higher education
16 and other nonprofit organizations to develop and
17 provide, either as individual institutions or in part-
18 nerships thereof, appropriate training and programs
19 to assist Foundation-funded principal investigators
20 at their institutions in achieving the goals of the
21 Broader Impacts Review Criterion as described in
22 subsection (a); and

23 (5) requires principal investigators applying for
24 Foundation research grants to provide evidence of
25 institutional support for the portion of the investiga-

1 tor's proposal designed to satisfy the Broader Im-
2 pacts Review Criterion, including evidence of rel-
3 evant training, programs, and other institutional re-
4 sources available to the investigator from either their
5 home institution or organization or another institu-
6 tion or organization with relevant expertise.

7 **TITLE II—RESEARCH AND**
8 **INNOVATION**

9 **SEC. 201. SUPPORT FOR POTENTIALLY TRANSFORMATIVE**
10 **RESEARCH.**

11 (a) **POLICY.**—The Director shall establish a policy
12 that requires the Foundation to use at least 5 percent of
13 its research budget to fund basic, high-risk, high-reward
14 research proposals. Support for facilities and infrastruc-
15 ture, including preconstruction design and operations and
16 maintenance of major research facilities, shall not be
17 counted as part of the research budget for the purposes
18 of this section.

19 (b) **IMPLEMENTATION.**—In implementing such policy,
20 the Foundation may—

21 (1) develop solicitations specifically for high-
22 risk, high-reward research;

23 (2) establish review panels for the primary pur-
24 pose of selecting high-risk, high-reward proposals or
25 modify instructions to standard review panels to re-

1 (2) draw upon well-integrated, diverse teams of
2 investigators, including students or postdoctoral re-
3 searchers, from one or more disciplines; and

4 (3) foster creativity and pursue high-risk, high-
5 reward research.

6 (b) PRIORITY.—In selecting grant recipients under
7 this section, the Director shall give priority to applicants
8 that propose to use advances in cyberinfrastructure and
9 simulation-based science engineering.

10 **SEC. 203. NATIONAL SCIENCE FOUNDATION MANUFAC-**
11 **TURING RESEARCH.**

12 The Director shall carry out a program to award
13 merit-reviewed, competitive grants to institutions of higher
14 education to support fundamental research leading to
15 transformative advances in manufacturing technologies,
16 processes, and enterprises that will support United States
17 manufacturing through improved performance, produc-
18 tivity, sustainability, and competitiveness. Research areas
19 may include—

20 (1) nanomanufacturing;

21 (2) manufacturing and construction machines
22 and equipment, including robotics, automation, and
23 other intelligent systems;

24 (3) manufacturing enterprise systems;

25 (4) advanced sensing and control techniques;

1 (5) materials processing; and

2 (6) information technologies for manufacturing,
3 including predictive and real-time models and sim-
4 ulations, and virtual manufacturing.

5 **SEC. 204. STRENGTHENING INSTITUTIONAL RESEARCH**
6 **PARTNERSHIPS.**

7 (a) IN GENERAL.—For any Foundation research
8 grant, in an amount greater than \$2,000,000, to be car-
9 ried out through a partnership that includes one or more
10 minority-serving institutions or predominantly under-
11 graduate institutions and one or more institutions de-
12 scribed in subsection (b), the Director shall award funds
13 directly, according to the budget justification described in
14 the grant proposal, to at least two of the institutions of
15 higher education in the partnership, including at least one
16 minority-serving institution or one predominantly under-
17 graduate institution, to ensure a strong and equitable
18 partnership.

19 (b) INSTITUTIONS.—The institutions referred to in
20 subsection (a) are institutions of higher education that are
21 among the 100 institutions receiving, over the 3-year pe-
22 riod immediately preceding the awarding of grants, the
23 highest amount of research funding from the Foundation.

1 **SEC. 205. NATIONAL SCIENCE BOARD REPORT ON MID-**
2 **SCALE INSTRUMENTATION.**

3 (a) MID-SCALE RESEARCH INSTRUMENTATION
4 NEEDS.—The National Science Board shall evaluate the
5 needs, across all disciplines supported by the Foundation,
6 for mid-scale research instrumentation that falls between
7 the instruments funded by the Major Research Instrumen-
8 tation program and the very large projects funded by the
9 Major Research Equipment and Facilities Construction
10 program.

11 (b) REPORT ON MID-SCALE RESEARCH INSTRUMEN-
12 TATION PROGRAM.—Not later than 1 year after the date
13 of enactment of this Act, the National Science Board shall
14 submit to Congress a report on mid-scale research instru-
15 mentation at the Foundation. At a minimum, this report
16 shall include—

17 (1) the findings from the Board's evaluation of
18 instrumentation needs required under subsection (a),
19 including a description of differences across dis-
20 ciplines and Foundation research directorates;

21 (2) a recommendation or recommendations re-
22 garding how the Foundation should set priorities for
23 mid-scale instrumentation across disciplines and
24 Foundation research directorates;

25 (3) a recommendation or recommendations re-
26 garding the appropriateness of expanding existing

1 programs, including the Major Research Instrumen-
2 tation program or the Major Research Equipment
3 and Facilities Construction program, to support
4 more instrumentation at the mid-scale;

5 (4) a recommendation or recommendations re-
6 garding the need for and appropriateness of a new,
7 Foundation-wide program or initiative in support of
8 mid-scale instrumentation, including any rec-
9 ommendations regarding the administration of and
10 budget for such a program or initiative and the ap-
11 propriate scope of instruments to be funded under
12 such a program or initiative; and

13 (5) any recommendation or recommendations
14 regarding other options for supporting mid-scale re-
15 search instrumentation at the Foundation.

16 **SEC. 206. SENSE OF CONGRESS ON OVERALL SUPPORT FOR**
17 **RESEARCH INFRASTRUCTURE AT THE FOUN-**
18 **DATION.**

19 It is the sense of Congress that the Foundation
20 should strive to keep the percentage of the Foundation
21 budget devoted to research infrastructure in the range of
22 24 to 27 percent, as recommended in the 2003 National
23 Science Board report entitled “Science and Engineering
24 Infrastructure for the 21st Century”.

1 **TITLE III—STEM EDUCATION**
2 **AND WORKFORCE TRAINING**

3 **SEC. 301. GRADUATE STUDENT SUPPORT.**

4 (a) FINDING.—The Congress finds that—

5 (1) the Integrative Graduate Education and Re-
6 search Traineeship program is an important pro-
7 gram for training the next generation of scientists
8 and engineers in team-based interdisciplinary re-
9 search and problem solving, and for providing them
10 with the many additional skills, such as communica-
11 tion skills, needed to thrive in diverse STEM ca-
12 reers; and

13 (2) the Integrative Graduate Education and Re-
14 search Traineeship program is no less valuable to
15 the preparation and support of graduate students
16 than the Foundation’s Graduate Research Fellow-
17 ship program.

18 (b) EQUAL TREATMENT OF IGERT AND GRF.—Be-
19 ginning in fiscal year 2011, the Director shall increase or,
20 if necessary, decrease funding for the Foundation’s Inte-
21 grative Graduate Education and Research Traineeship
22 program (or any program by which it is replaced) at least
23 at the same rate as it increases or decreases funding for
24 the Graduate Research Fellowship program.

1 (c) SUPPORT FOR GRADUATE STUDENT RESEARCH
2 FROM THE RESEARCH ACCOUNT.—For each of the fiscal
3 years 2011 through 2015, at least 50 percent of the total
4 Foundation funds allocated to the Integrative Graduate
5 Education and Research Traineeship program and the
6 Graduate Research Fellowship program shall come from
7 funds appropriated for Research and Related Activities.

8 (d) COST OF EDUCATION ALLOWANCE FOR GRF PRO-
9 GRAM.—Section 10 of the National Science Foundation
10 Act of 1950 (42 U.S.C. 1869) is amended—

11 (1) by inserting “(a)” before “The Foundation
12 is authorized”; and

13 (2) by adding at the end the following new sub-
14 section:

15 “(b) The Director shall establish for each year the
16 amount to be awarded for scholarships and fellowships
17 under this section for that year. Each such scholarship
18 and fellowship shall include a cost of education allowance
19 of at least the lesser of \$12,000 or the cost of education
20 at the institution in which the scholarship or fellowship
21 recipient is matriculated, subject to any restrictions on the
22 use of cost of education allowance as determined by the
23 Director.”.

1 **SEC. 302. POSTDOCTORAL FELLOWSHIP IN STEM EDU-**
2 **CATION RESEARCH.**

3 (a) IN GENERAL.—The Director shall establish
4 postdoctoral fellowships in STEM education research to
5 provide recent doctoral degree graduates in STEM fields
6 with the necessary skills to assume leadership roles in
7 STEM education research, program development, and
8 evaluation in our Nation's diverse educational institutions.

9 (b) AWARDS.—

10 (1) DURATION.—Fellowships may be awarded
11 under this section for a period of up to 24 months
12 in duration, renewable for an additional 12 months.
13 The Director shall establish criteria for eligibility for
14 renewal of the fellowship.

15 (2) STIPEND.—The Director shall determine
16 the amount of the award for a fellowship, which
17 shall include a stipend and a research allowance, and
18 may include an educational allowance.

19 (3) LOCATION.—A fellowship shall be awarded
20 for research at any institution of higher education
21 that offers degrees in fields supported by the Foun-
22 dation, or at any institution or organization that the
23 Director determines is eligible for education research
24 grants from the Foundation.

25 (4) NUMBER OF AWARDS.—The Director may
26 award up to 20 new fellowships per year.

1 (c) RESEARCH.—Fellowships under this section shall
2 be awarded for research on STEM education at any edu-
3 cational level, including grades K-12, undergraduate,
4 graduate, and general public education, in both formal and
5 informal settings. Research topics may include—

6 (1) learning processes;

7 (2) knowledge transfer, including curriculum
8 development;

9 (3) uses of technology as teaching and learning
10 tools;

11 (4) integrating STEM fields; and

12 (5) student assessment and program evaluation.

13 (d) ELIGIBILITY.—To be eligible for a fellowship
14 under this section, an individual must—

15 (1) be a United States citizen or national, or an
16 alien lawfully admitted to the United States for per-
17 manent residence, at the time of application; and

18 (2) have received a doctoral degree in one of the
19 STEM fields supported by the Foundation within 3
20 years prior to the fellowship application deadline.

21 **SEC. 303. ROBERT NOYCE TEACHER SCHOLARSHIP PRO-**
22 **GRAM.**

23 (a) SECTION 10 AMENDMENTS.—Section 10 of the
24 National Science Foundation Authorization Act of 2002
25 (42 U.S.C. 1862n-1) is amended—

1 (1) in subsection (c)(4), by striking “Service re-
2 quired under this paragraph shall be performed in a
3 high-need local educational agency.”; and

4 (2) in subsection (c), by adding at the end a
5 new paragraph as follows:

6 “(5) EXCEPTION.—The period of service obliga-
7 tion under paragraph (4) shall be reduced by 1 year
8 for scholarship recipients whose service is performed
9 in a high-need local educational agency. The Direc-
10 tor shall establish and maintain a central clearing-
11 house of information on teaching opportunities avail-
12 able in high-need local educational agencies through-
13 out the United States, which shall be made available
14 to individuals having a service obligation under this
15 section.”.

16 (b) SECTION 10A AMENDMENTS.—Section 10A of
17 the National Science Foundation Authorization Act of
18 2002 (42 U.S.C. 1862n-1a) is amended in subsection
19 (h)(1) by striking “50” and inserting “30”.

20 **SEC. 304. INSTITUTIONS SERVING PERSONS WITH DISABIL-**
21 **ITIES.**

22 For the purposes of the activities and programs sup-
23 ported by the Foundation, institutions of higher education
24 chartered to serve large numbers of students with disabil-
25 ities, including Gallaudet University, Landmark College,

1 and the National Technical Institute for the Deaf, shall
2 be designated as minority-serving institutions.

3 **SEC. 305. INSTITUTIONAL INTEGRATION.**

4 (a) INNOVATION THROUGH INSTITUTIONAL INTE-
5 GRATION.—The Director shall award grants for the insti-
6 tutional integration of projects funded by the Foundation
7 with a focus on education or broadening participation in
8 STEM by underrepresented groups for the purpose of in-
9 creasing collaboration and coordination across funded
10 projects and institutions and expanding the impact of such
11 projects within and among institutions of higher education
12 in an innovative and sustainable manner.

13 (b) PROGRAM ACTIVITIES.—The program under this
14 section shall support integrative activities that involve the
15 strategic and innovative combination of Foundation-fund-
16 ed projects and that provide for—

17 (1) additional opportunities to increase the re-
18 cruitment, retention, and degree attainment of
19 underrepresented groups in STEM disciplines;

20 (2) the inclusion of programming, practices,
21 and policies that encourage the integration of edu-
22 cation and research;

23 (3) seamless transitions from one educational
24 level to another; and

1 (4) other activities that expand and deepen the
2 impact of Foundation-funded projects with a focus
3 on education or broadening participation in STEM
4 by underrepresented groups and enhance their sus-
5 tainability.

6 (c) REVIEW CRITERIA.—In selecting recipients of
7 grants under this section, the Director shall consider at
8 a minimum—

9 (1) the extent to which the proposed project ad-
10 dresses the goals of project and program integration
11 and adds value to the existing funded projects;

12 (2) the extent to which there is a proven record
13 of success for the existing projects on which the pro-
14 posed integration project is based; and

15 (3) the extent to which the proposed project ad-
16 dresses the modification of programming, practices,
17 and policies necessary to achieve the purpose de-
18 scribed in subsection (a).

19 (d) PRIORITY.—In selecting recipients of grants
20 under this section, the Director shall give priority to pro-
21 posals for which a senior institutional administrator, in-
22 cluding a dean or other administrator of equal or higher
23 rank, serves as the principal investigator.

1 **SEC. 306. POSTDOCTORAL RESEARCH FELLOWSHIPS.**

2 (a) IN GENERAL.—The Director shall establish a
3 Foundation-wide postdoctoral research fellowship pro-
4 gram, to award competitive, merit-based postdoctoral re-
5 search fellowships in any field of research supported by
6 the Foundation.

7 (b) DURATION AND AMOUNT.—Fellowships may be
8 awarded under this section for a period of up to 3 years
9 in duration. The Director shall determine the amount of
10 the award for a fellowship, which shall include a stipend
11 and a research allowance, and may include an educational
12 allowance.

13 (c) ELIGIBILITY.—To be eligible to receive a fellow-
14 ship under this section, an individual—

15 (1) must be a United States citizen or national,
16 or an alien lawfully admitted to the United States
17 for permanent residence, at the time of application;

18 (2) must have received a doctoral degree in any
19 field of research supported by the Foundation within
20 3 years prior to the fellowship application deadline,
21 or will complete a doctoral degree no more than 1
22 year after the application deadline; and

23 (3) may not have previously received funding as
24 the principal investigator of a research grant from
25 the Foundation, unless such funding was received as
26 a graduate student.

1 (d) PRIORITY.—In evaluating applications for fellow-
2 ships under this section, the Director shall give priority
3 to applications that include—

- 4 (1) proposals for interdisciplinary research; or
5 (2) proposals for high-risk, high-reward re-
6 search.

7 (e) ADDITIONAL CONSIDERATIONS.—In evaluating
8 applications for fellowships under this section, the Direc-
9 tor shall give consideration to the goal of promoting the
10 participation of individuals identified in section 33 or 34
11 of the Science and Engineering Equal Opportunities Act
12 (42 U.S.C. 1885a or 1885b).

13 (f) NONSUBSTITUTION.—The fellowship program au-
14 thorized under this section is not intended to replace or
15 reduce support for postdoctoral research through existing
16 programs at the Foundation.

17 **SEC. 307. BROADENING PARTICIPATION TRAINING AND**
18 **OUTREACH.**

19 The Director shall provide education and training—

- 20 (1) to Foundation staff and grant proposal re-
21 view panels on effective mechanisms and tools for
22 broadening participation in STEM by underrep-
23 resented groups, including reviewer selection and
24 mitigation of implicit bias in the review process; and

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- 1 (2) to Foundation staff on related outreach ap-
- 2 proaches.

SECTION-BY-SECTION ANALYSIS OF
THE NATIONAL SCIENCE FOUNDATION AUTHORIZATION ACT OF 2010

SEC. 1. SHORT TITLE; TABLE OF CONTENTS—The National Science Foundation Authorization Act of 2010; table of contents.

Title I—General Provisions

SEC. 101. DEFINITIONS—Provides definitions for terms used in this Act.

SEC. 102. AUTHORIZATION OF APPROPRIATIONS—Authorizes \$47.5 billion for the National Science Foundation (NSF) for fiscal years 2011–2015, including \$38 billion for research and related activities (R&RA), \$6.4 billion for education and human resources (EHR), and \$1.2 billion for major research equipment and facilities construction (MREFC).

SEC. 103. ADMINISTRATIVE AMENDMENTS—Eliminates the cap on the number of professional staff for the National Science Board (“the Board”). Changes the date on which the Board’s biennial Science and Engineering Indicators is due to the President and Congress. Modifies the scope of reports the Board may submit to the President and Congress. Modifies audit requirement for Board adherence to the Sunshine Act.

SEC. 104. BROADER IMPACTS REVIEW CRITERION—Clarifies the intent of the Foundation’s Broader Impacts Review Criterion. Requires the Director to develop and implement a Foundation-wide policy that: includes a plan to educate Foundation staff, merit review panels, and grant applicants on the goals of the broader impacts review criterion; encourages colleges, universities and other organizations such as science “ museums to help NSF-funded investigators achieve the goals of the broader impacts review criterion through existing evidence-based programs and activities; and requires grant applicants to provide evidence of such institutional support for the portion of their proposal intended to satisfy the broader impact review criterion.

Title II—Research and Innovation

SEC. 201. SUPPORT FOR POTENTIALLY TRANSFORMATIVE RESEARCH—Requires the Director to apply at least 5 percent of the agency’s research toward high-risk, high-reward basic research. Provide a definition for “high-risk, high-reward” and examples for how the Director may meet the 5 percent requirement.

SEC. 202. FACILITATING INTERDISCIPLINARY COLLABORATIONS FOR NATIONAL NEEDS—Requires the Director to provide awards for interdisciplinary research collaborations that are designed to address critical challenges to national security, competitiveness, and societal well-being.

SEC. 203. NATIONAL SCIENCE FOUNDATION MANUFACTURING RESEARCH—Requires the Director to carry out a program to award competitive grants for manufacturing research.

SEC. 204. STRENGTHENING INSTITUTIONAL RESEARCH PARTNERSHIPS—In cases where a research grant involves a partnership of colleges and universities, including a minority-serving institution or a predominately undergraduate institution, the Director is required to award funds to at least two of the institutions directly, including at least one minority-serving or predominately undergraduate institution.

SEC. 205. NATIONAL SCIENCE BOARD REPORT ON MID-SCALE INSTRUMENTATION—Requires the Board to evaluate the need for mid-scale research instrumentation (instrumentation that falls between the Major Research Instrumentation program and the Major Research Equipment and Facilities Construction program), and provide recommendations regarding how the Foundation can best address those needs.

SEC. 206. SENSE OF CONGRESS ON OVERALL SUPPORT FOR RESEARCH INFRASTRUCTURE AT THE FOUNDATION—Expresses the sense of Congress that the Foundation should strive to keep the percentage of the Foundation budget devoted to research infrastructure in the range of 24 to 27 percent, as recommended in the 2003 National Science Board report, “Science and Engineering Infrastructure for the 21st Century.”

Title III—STEM Education and Workforce Training

SEC. 301. GRADUATE STUDENT SUPPORT—Requires the Director to increase or decrease funding for the Integrative Graduate Education and Research Traineeship (IGERT) program at the same rate as the Graduate Research Fellowship (GRF) program. Requires that at least half of the total funds for IGERT and GRF come from the R&RA account. Requires the Director to increase the current cost of education allowance for awards made through the GRF program by \$1,500.

SEC. 302. POSTDOCTORAL FELLOWSHIP IN STEM EDUCATION RESEARCH—Requires the Director to establish a postdoctoral fellowship program to encourage recent doctoral degree graduates in the STEM fields to pursue STEM education research and become leaders in STEM education reform.

SEC. 303. ROBERT NOYCE TEACHER SCHOLARSHIP PROGRAM—Amends current law to remove the requirement that the service obligation of scholarship recipients be performed in a high-need local education agency, and instead provides a 1 year reduction of the service obligation for scholarship recipients who choose to perform their service in a high-need local education agency. Requires the Director to maintain a clearinghouse of information on teaching opportunities available in high-need local education agencies. Lowers the required amount of institutional matching for Noyce grants under Section 10A (master teachers and STEM professionals) from 50 to 30 percent.

SEC. 304. INSTITUTIONS SERVING PERSONS WITH DISABILITIES—Designates all institutions of higher education that are chartered to serve large numbers of disabled students as minority-serving institutions for the purposes of NSF grants and activities.

SEC. 305. INSTITUTIONAL INTEGRATION—Requires the Director to award grants to colleges and universities for the integration of Foundation funded projects at those institutions in order to increase collaboration across funded projects and expand the impact of such projects.

SEC. 306. POSTDOCTORAL RESEARCH FELLOWSHIPS—Requires the Director to establish a Foundation-wide postdoctoral research fellowship program, with priority given to proposals for interdisciplinary research and high-risk, high-reward research.

SEC. 307. BROADENING PARTICIPATION TRAINING AND OUTREACH—Requires the Director to provide education and training to Foundation staff and review panels on effective tools for increasing participation in STEM by underrepresented groups.

COMMITTEE ON SCIENCE AND TECHNOLOGY
RESEARCH AND SCIENCE EDUCATION
SUBCOMMITTEE MARKUP
April 14, 2010

AMENDMENT ROSTER

Committee Print – National Science Foundation Authorization Act of 2010

No.	Sponsor	Description	Results
1	Chairman Lipinski (Manager's Amendment)	<p>Makes several technical and clarifying changes to the bill.</p> <p>Adds a new section (National Center for Science and Engineering Statistics) to create a Federal clearinghouse for the collection, interpretation, analysis, and dissemination of objective data on science, engineering, technology, and research and development.</p> <p>Adds a new section (Partnerships for Innovation) to establish a program to award competitive, merit-reviewed grants to institutions of higher education to establish and expand partnerships that promote innovation and increase the economic and social impact of research by developing tools and resources to connect new scientific discoveries to practical uses.</p> <p>Adds a new section (Transforming Undergraduate Education in STEM) which requires the Director to award competitive, merit-reviewed grants to institutions of higher education to reform undergraduate STEM education for the purpose of increasing the number and quality of students studying toward and completing baccalaureate degrees in STEM and improving the STEM learning outcomes for all the undergraduate students.</p> <p>Adds a new section (21st Century Graduate</p>	Agreed to by voice vote.

		Education) which requires the Director to award competitive, merit-reviewed grants to institutions of higher education to implement or expand research-based reforms in master's and doctoral level STEM education that emphasize preparation for diverse careers utilizing STEM degrees.	
2	Chairman Lipinski (060)	Amends Title II of the print by adding a new section (Prize Awards) authorizing a pilot program to award innovation inducement cash prizes in any area of research supported by the Foundation.	Agreed to by voice vote.
3	Mr. Neugebauer (009)	Amends section 102 (Authorization of Appropriations) by reducing by two years the authorization period.	Defeated by Roll Call vote: Y-4 N-7
4	Mr. Neugebauer (007)	Amends section 203 (National Science Foundation Manufacturing Research) by striking the specified areas of research.	Defeated by voice vote.
5	Mr. Neugebauer (008)	Amends section 303 (Robert Noyce Teacher Scholarship Program) to restore the 50 percent cost-share requirement under current law (which may be made through in-kind or monetary contributions) for universities who participate in the Program.	Defeated by voice vote.
6	Ms. Johnson (100)	Amends Title III of the print by adding a new section (Undergraduate Broadening Participation Program) which requires the Foundation to continue their current Undergraduate Broadening Participation Program through September 30, 2011. The amendment also requires the Director to develop a plan prior to any realignment or consolidation of the Foundation's Undergraduate Broadening Participation Program, and submit that plan to Congress three months prior to implementation.	Agreed to by voice vote.
7	Ms. Fudge (059)	Amends Title III of the print by adding a new section (Grand Challenges in Education Research) which requires the Director and Secretary of Education to	Agreed to by voice vote.

		collaborate in identifying, prioritizing, and developing strategies to address grand challenges in pre-K-12 STEM R&D, and ensuring the dissemination of the results of the R&D.	
8	Mr. Tonko (025)	Amends Title III of the print by adding a new section (Research Experiences for Undergraduates) which requires the Director to award competitive, merit-reviewed grants to institutions of higher education, nonprofit organizations, or consortia thereof, to provide research experiences for 10 or more undergraduate STEM students.	Agreed to by voice vote.

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**AMENDMENT TO THE COMMITTEE PRINT
OFFERED BY MR. LIPINSKI OF ILLINOIS**

Page 8, line 9, strike “Congress” and insert “appropriate Congressional committees of jurisdiction”

Page 8, lines 21 and 22, amend subparagraph (B) to read as follows:

1 (B) by striking “the audit required under
2 paragraph (3) along with” and inserting “any”;
3 and

Page 9, line 14, strike “K-12” and insert “pre-K-12”.

Page 10, line 16, insert “education or research” after “other nonprofit”.

Page 11, after line 6, insert the following new section:

4 **SEC. 105. NATIONAL CENTER FOR SCIENCE AND ENGINEER-**
5 **ING STATISTICS.**

6 (a) ESTABLISHMENT.—There is established within
7 the Foundation a National Center for Science and Engi-
8 neering Statistics (in this section referred to as the “Cen-
9 ter”), that shall serve as a central Federal clearinghouse

1 for the collection, interpretation, analysis, and dissemina-
2 tion of objective data on science, engineering, technology,
3 and research and development.

4 (b) DUTIES.—In carrying out subsection (a) of this
5 section, the Director, acting through the Center shall—

6 (1) collect, acquire, analyze, report, and dis-
7 seminate statistical data related to the science and
8 engineering enterprise in the United States and
9 other nations that is relevant and useful to practi-
10 tioners, researchers, policymakers, and the public,
11 including statistical data on—

12 (A) research and development trends;

13 (B) the science and engineering workforce;

14 (C) United States competitiveness in
15 science, engineering, technology, and research
16 and development; and

17 (D) the condition and progress of United
18 States STEM education;

19 (2) support research using the data it collects,
20 and on methodologies in areas related to the work
21 of the Center; and

22 (3) support the education and training of re-
23 searchers in the use of large-scale, nationally rep-
24 resentative data sets.

1 (c) STATISTICAL REPORTS.—The Director or the Na-
2 tional Science Board, acting through the Center, shall
3 issue regular, and as necessary, special statistical reports
4 on topics related to the national and international science
5 and engineering enterprise such as the biennial report re-
6 quired by section 4 (j)(1) of the National Science Founda-
7 tion Act of 1950 (42 U.S.C. 1863(j)(1)) on indicators of
8 the state of science and engineering in the United States.

Page 11, line 13, strike “basic, high-risk, high-re-
ward” and insert “high-risk, high-reward basic”.

Page 11, lines 21 and 22, strike “high-risk, high-re-
ward” and insert “high-risk, high-reward basic”.

Page 12, line 5, strike “high-risk, high-reward” and
insert “high-risk, high-reward basic”.

Page 12, line 8, strike “high-risk, high-reward re-
search” and insert “high-risk, high-reward basic re-
search”.

Page 13, line 8, strike “use” and insert “utilize”.

Page 13, line 9, insert “and” after “simulation-based
science”.

At the end of title II, add the following new section:

1 **SEC. 207. PARTNERSHIPS FOR INNOVATION.**

2 (a) IN GENERAL.—The Director shall carry out a
3 program to award merit-reviewed, competitive grants to
4 institutions of higher education to establish and to expand
5 partnerships that promote innovation and increase the
6 economic and social impact of research by developing tools
7 and resources to connect new scientific discoveries to prac-
8 tical uses.

9 (b) PARTNERSHIPS.—

10 (1) IN GENERAL.—To be eligible for funding
11 under this section, an institution of higher education
12 must propose establishment of a partnership that—

13 (A) includes at least one private sector en-
14 tity; and

15 (B) may include other institutions of high-
16 er education, public sector institutions, and pri-
17 vate sector entities.

18 (2) PRIORITY.—In selecting grant recipients
19 under this section, the Director shall give priority to
20 partnerships that include one or more institutions of
21 higher education that are among the 100 institu-
22 tions receiving, over the 3-year period immediately
23 preceding the awarding of grants, the highest
24 amount of research funding from the Foundation
25 and at least one of the following:

26 (A) A minority serving institution.

1 (B) A primarily undergraduate institution.

2 (C) A 2-year college.

3 (e) PROGRAM.—Proposals funded under this section
4 shall seek to—

5 (1) increase the economic or social impact of
6 the most promising research at the institution or in-
7 stitutions of higher education that are members of
8 the partnership through knowledge transfer or com-
9 mercialization;

10 (2) increase the engagement of faculty and stu-
11 dents across multiple disciplines and departments,
12 including faculty and students in schools of business
13 and other appropriate non-STEM fields and dis-
14 ciplines in knowledge transfer activities;

15 (3) enhance education and mentoring of stu-
16 dents and faculty in innovation and entrepreneur-
17 ship through networks, courses, and development of
18 best practices and curricula;

19 (4) strengthen the culture of the institution or
20 institutions of higher education to undertake and
21 participate in activities related to innovation and
22 leading to economic or social impact;

23 (5) broaden the participation of all types of in-
24 stitutions of higher education in activities to meet

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1 STEM workforce needs and promote innovation and
2 knowledge transfer; and

3 (6) build lasting partnerships with local and re-
4 gional businesses, local and State governments, and
5 other relevant entities.

6 (d) ADDITIONAL CRITERIA.—In selecting grant re-
7 cipients under this section, the Director shall also consider
8 the extent to which the applicants are able to demonstrate
9 evidence of institutional support for, and commitment
10 to—

11 (1) achieving the goals of the program as de-
12 scribed in subsection (c);

13 (2) expansion to a university-wide program if
14 the initial proposal is not for a university-wide pro-
15 gram; and

16 (3) sustaining any new innovation tools and re-
17 sources generated from funding under this program.

18 (e) LIMITATION.—No funds provided under this sec-
19 tion may be used to construct or renovate a building or
20 structure.

Page 18, lines 19 through 21, strike “at least” and
all that follows through “is matriculated” and insert
“\$12,000”.

Page 20, line 3, strike “K-12” and insert “pre-K-
12”.

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Page 20, line 6, insert “and progressions” after “learning processes”.

Page 20, line 12, strike “student assessment” and insert “assessment of student learning”.

Page 22, lines 7 and 8, strike “or broadening participation in STEM by underrepresented groups” and insert “, or on broadening participation in STEM by underrepresented groups,”.

Page 23, lines 3 and 4, strike “or broadening participation in STEM by underrepresented groups” and insert “, or on broadening participation in STEM by underrepresented groups,”.

At the end of title III, add the following new sections:

1 **SEC. 308. TRANSFORMING UNDERGRADUATE EDUCATION**
2 **IN STEM.**

3 Section 17 of the National Science Foundation Au-
4 thorization Act of 2002 (42 U.S.C. 1862n-6) is amended
5 to read as follows:

6 **“SEC. 17. TRANSFORMING UNDERGRADUATE EDUCATION**
7 **IN STEM.**

8 “(a) IN GENERAL.—The Director shall award grants,
9 on a competitive, merit-reviewed basis, to institutions of
10 higher education to reform undergraduate STEM edu-

1 cation for the purpose of increasing the number and qual-
2 ity of students studying toward and completing baccalaureate
3 degrees in STEM and improving the STEM learning outcomes for all undergraduate students, including through—

6 “(1) development, implementation, and assessment of innovative, research-based approaches to transforming the teaching and learning of disciplinary or interdisciplinary STEM at the undergraduate level; and

11 “(2) expansion of successful STEM reform efforts beyond a single course or group of courses to achieve reform within an entire academic unit, or expansion of successful reform efforts beyond a single academic unit to other STEM academic units within an institution or to comparable academic units at other institutions.

18 “(b) USES OF FUNDS.—Activities supported by grants under this section may include—

20 “(1) creation of multidisciplinary or interdisciplinary courses or programs that formalize collaborations for the purpose of improved student instruction and research in STEM;

24 “(2) expansion of undergraduate STEM research opportunities to include interdisciplinary re-

1 search opportunities and research opportunities in
2 industry, at Federal labs, and at international re-
3 search institutions or research sites;

4 “(3) implementation or expansion of bridge, co-
5 hort, tutoring, or mentoring programs proven to en-
6 hance student recruitment or persistence to degree
7 completion in STEM, including programs that ad-
8 dress student transition from two-year to four-year
9 institutions;

10 “(4) improvement of undergraduate STEM
11 education for nonmajors, including education ma-
12 jors;

13 “(5) implementation of evidence-based, tech-
14 nology-driven reform efforts that directly impact un-
15 dergraduate STEM instruction or research experi-
16 ences;

17 “(6) development and implementation of faculty
18 and graduate teaching assistant development pro-
19 grams focused on improved instruction, mentoring,
20 assessment of student learning, and support of un-
21 dergraduate STEM students;

22 “(7) support for graduate students and
23 postdoctoral fellows to participate in instructional or
24 assessment activities at primarily undergraduate in-
25 stitutions; and

1 “(8) research on teaching and learning of
2 STEM at the undergraduate level related to the pro-
3 posed reform effort, including assessment and eval-
4 uation of the proposed reform activities, research on
5 scalability and sustainability of approaches to re-
6 form, and development and implementation of longi-
7 tudinal studies of students included in the proposed
8 reform effort.

9 “(c) PARTNERSHIP.—An institution of higher edu-
10 cation may partner with one or more other nonprofit edu-
11 cation or research organizations, including scientific and
12 engineering societies, for the purposes of carrying out the
13 activities authorized under this section.

14 “(d) SELECTION PROCESS.—

15 “(1) APPLICATIONS.—An institution of higher
16 education seeking a grant under this section shall
17 submit an application to the Director at such time,
18 in such manner, and containing such information as
19 the Director may require. The application shall in-
20 clude, at a minimum—

21 “(A) a description of the proposed reform
22 effort;

23 “(B) a description of the research findings
24 that will serve as the basis for the proposed re-
25 form effort or, in the case of applications that

1 propose an expansion of a previously imple-
2 mented reform effort, a description of the pre-
3 viously implemented reform effort, including in-
4 dicators of success such as data on student re-
5 cruitment, persistence to degree completion,
6 and academic achievement;

7 “(C) evidence of institutional support for,
8 and commitment to, the proposed reform effort,
9 including long-term commitment to implement
10 successful strategies from the current reform
11 effort beyond the academic unit or units in-
12 cluded in the grant proposal or to disseminate
13 successful strategies to other institutions;

14 “(D) a description of existing or planned
15 institutional policies and practices regarding
16 faculty hiring, promotion, tenure, and teaching
17 assignment that reward faculty contributions to
18 undergraduate STEM education; and

19 “(E) a description of the plans for assess-
20 ment and evaluation of the proposed reform ac-
21 tivities, including evidence of participation by
22 individuals with experience in assessment and
23 evaluation of teaching and learning programs.

1 “(2) REVIEW OF APPLICATIONS.—In selecting
2 grant recipients under this section, the Director
3 shall consider at a minimum—

4 “(A) the likelihood of success in under-
5 taking the proposed effort at the institution
6 submitting the application, including the extent
7 to which the faculty, staff, and administrators
8 of the institution are committed to making the
9 proposed institutional reform a priority of the
10 participating academic unit or units;

11 “(B) the degree to which the proposed re-
12 form will contribute to change in institutional
13 culture and policy such that a greater value is
14 placed on faculty engagement in undergraduate
15 education;

16 “(C) the likelihood that the institution will
17 sustain or expand the reform beyond the period
18 of the grant; and

19 “(D) the degree to which scholarly assess-
20 ment and evaluation plans are included in the
21 design of the reform effort, including the degree
22 to which such assessment and evaluation con-
23 tribute to the systematic accumulation of
24 knowledge on STEM education.

1 “(3) PRIORITY.—For proposals that include an
2 expansion of existing reform efforts beyond a single
3 academic unit, the Director shall give priority to
4 proposals for which a senior institutional adminis-
5 trator, including a dean or other administrator of
6 equal or higher rank, serves as the principal investi-
7 gator or a coprincipal investigator.

8 “(4) GRANT DISTRIBUTION.—The Director
9 shall ensure, to the extent practicable, that grants
10 awarded under this section are made to a variety of
11 types of institutions of higher education.”.

12 **SEC. 309. 21ST CENTURY GRADUATE EDUCATION.**

13 (a) IN GENERAL.—The Director shall award grants,
14 on a competitive, merit-reviewed basis, to institutions of
15 higher education to implement or expand research-based
16 reforms in master’s and doctoral level STEM education
17 that emphasize preparation for diverse careers utilizing
18 STEM degrees, including at diverse types of institutions
19 of higher education, in industry, and at government agen-
20 cies and research laboratories.

21 (b) USES OF FUNDS.—Activities supported by grants
22 under this section may include—

23 (1) creation of multidisciplinary or interdiscipli-
24 nary courses or programs for the purpose of im-
25 proved student instruction and research in STEM;

- 1 (2) expansion of graduate STEM research op-
2 portunities to include interdisciplinary research op-
3 portunities and research opportunities in industry,
4 at Federal laboratories, and at international re-
5 search institutions or research sites;
- 6 (3) development and implementation of future
7 faculty training programs focused on improved in-
8 struction, mentoring, assessment of student learn-
9 ing, and support of undergraduate STEM students;
- 10 (4) support and training for graduate students
11 to participate in instructional activities beyond the
12 traditional teaching assistantship, and especially as
13 part of ongoing educational reform efforts, including
14 at pre-K-12 schools, informal science education insti-
15 tutions, and primarily undergraduate institutions;
- 16 (5) creation, improvement, or expansion of in-
17 novative graduate programs such as science master's
18 degree programs;
- 19 (6) development and implementation of semi-
20 nars, workshops, and other professional development
21 activities that increase the ability of graduate stu-
22 dents to engage in innovation, technology transfer,
23 and entrepreneurship;
- 24 (7) development and implementation of semi-
25 nars, workshops, and other professional development

1 activities that increase the ability of graduate stu-
2 dents to effectively communicate their research find-
3 ings to technical audiences outside of their own dis-
4 cipline and to nontechnical audiences;

5 (8) expansion of successful STEM reform ef-
6 forts beyond a single academic unit to other STEM
7 academic units within an institution or to com-
8 parable academic units at other institutions; and

9 (9) research on teaching and learning of STEM
10 at the graduate level related to the proposed reform
11 effort, including assessment and evaluation of the
12 proposed reform activities and research on scalability
13 and sustainability of approaches to reform.

14 (c) PARTNERSHIP.—An institution of higher edu-
15 cation may partner with one or more other nonprofit edu-
16 cation or research organizations, including scientific and
17 engineering societies, for the purposes of carrying out the
18 activities authorized under this section.

19 (d) SELECTION PROCESS.—

20 (1) APPLICATIONS.—An institution of higher
21 education seeking a grant under this section shall
22 submit an application to the Director at such time,
23 in such manner, and containing such information as
24 the Director may require. The application shall in-
25 clude, at a minimum—

1 (A) a description of the proposed reform
2 effort;

3 (B) in the case of applications that propose
4 an expansion of a previously implemented re-
5 form effort at the applicant's institution or at
6 other institutions, a description of the pre-
7 viously implemented reform effort;

8 (C) evidence of institutional support for,
9 and commitment to, the proposed reform effort,
10 including long-term commitment to implement
11 successful strategies from the current reform
12 effort beyond the academic unit or units in-
13 cluded in the grant proposal or to disseminate
14 successful strategies to other institutions; and

15 (D) a description of the plans for assess-
16 ment and evaluation of the grant proposed re-
17 form activities.

18 (2) REVIEW OF APPLICATIONS.—In selecting
19 grant recipients under this section, the Director
20 shall consider at a minimum—

21 (A) the likelihood of success in under-
22 taking the proposed effort at the institution
23 submitting the application, including the extent
24 to which the faculty, staff, and administrators
25 of the institution are committed to making the

1 proposed institutional reform a priority of the
2 participating academic unit or units;

3 (B) the degree to which the proposed re-
4 form will contribute to change in institutional
5 culture and policy such that a greater value is
6 placed on preparing graduate students for di-
7 verse careers utilizing STEM degrees;

8 (C) the likelihood that the institution will
9 sustain or expand the reform beyond the period
10 of the grant; and

11 (D) the degree to which scholarly assess-
12 ment and evaluation plans are included in the
13 design of the reform effort.

14 (e) REPEAL.—Section 7034 of the America COM-
15 PETES Act (42 U.S.C. 1862o–13) is repealed.



**AMENDMENT TO THE COMMITTEE PRINT
OFFERED BY MR. LIPINSKI OF ILLINOIS**

At the end of title II, add the following new section:

1 **SEC. 207. PRIZE AWARDS.**

2 (a) IN GENERAL.—The Director shall carry out a
3 pilot program to award innovation inducement cash prizes
4 in any area of research supported by the Foundation. The
5 Director may carry out a program of cash prizes only in
6 conformity with this section.

7 (b) TOPICS.—In identifying topics for prize competi-
8 tions under this section, the Director shall—

9 (1) consult widely both within and outside the
10 Federal Government;

11 (2) give priority to high-risk, high-reward re-
12 search challenges and to problems whose solution
13 could improve the economic competitiveness of the
14 United States; and

15 (3) give consideration to the extent to which the
16 topics have the potential to raise public awareness
17 about federally sponsored research.

18 (c) TYPES OF CONTESTS.—The Director shall con-
19 sider all categories of innovation inducement prizes, in-
20 cluding—

1 (1) contests in which the award is to the first
2 team or individual who accomplishes a stated objec-
3 tive; and

4 (2) contests in which the winner is the team or
5 individual who comes closest to achieving an objec-
6 tive within a specified time.

7 (d) ADVERTISING AND ANNOUNCEMENT.—

8 (1) ADVERTISING AND SOLICITATION OF COM-
9 PETITORS.—The Director shall widely advertise
10 prize competitions to encourage broad participation,
11 including by individuals, institutions of higher edu-
12 cation, nonprofit organizations, and businesses.

13 (2) ANNOUNCEMENT THROUGH FEDERAL REG-
14 ISTER NOTICE.—The Director shall announce each
15 prize competition by publishing a notice in the Fed-
16 eral Register. This notice shall include the subject of
17 the competition, the duration of the competition, the
18 eligibility requirements for participation in the com-
19 petition, the process for participants to register for
20 the competition, the amount of the prize, and the
21 criteria for awarding the prize, including the method
22 by which the prize winner or winners will be se-
23 lected.

1 (3) TIME TO ANNOUNCEMENT.—The Director
2 shall announce a prize competition within 18 months
3 after receipt of appropriated funds.

4 (e) FUNDING.—

5 (1) FUNDING SOURCES.—Prizes under this sec-
6 tion shall consist of Federal appropriated funds and
7 any funds raised pursuant to donations authorized
8 under section 11(f) of the National Science Founda-
9 tion Act of 1950 (42 U.S.C. 1870(f)) for specific
10 prize competitions.

11 (2) ANNOUNCEMENT OF PRIZES.—The Director
12 may not issue a notice as required by subsection
13 (d)(2) until all of the funds needed to pay out the
14 announced amount of the prize have been appro-
15 priated or committed in writing by another entity
16 pursuant to paragraph (1).

17 (f) ELIGIBILITY.—To be eligible to win a prize under
18 this section, an individual or entity—

19 (1) shall have complied with all of the require-
20 ments under this section;

21 (2) in the case of a private entity, shall be in-
22 corporated in and maintain a primary place of busi-
23 ness in the United States, and in the case of an in-
24 dividual, whether participating singly or in a group,
25 shall be a United States citizen or national, or an

1 alien lawfully admitted to the United States for per-
2 manent residence; and

3 (3) shall not be a Federal entity, a Federal em-
4 ployee acting within the scope of his or her employ-
5 ment, or a person employed at a Federal laboratory
6 acting within the scope of his or her employment.

7 (g) AWARDS.—

8 (1) NUMBER OF COMPETITIONS.—The Director
9 may announce up to 5 prize competitions through
10 the end of fiscal year 2013.

11 (2) SIZE OF AWARD.—The Director may deter-
12 mine the amount of each prize award based on the
13 prize topic, but no award shall be less than
14 \$1,000,000 or greater than \$3,000,000.

15 (3) SELECTING WINNERS.—The Director may
16 convene an expert panel to select a winner of a prize
17 competition. If the panel is unable to select a win-
18 ner, the Director shall determine the winner of the
19 prize.

20 (4) PUBLIC OUTREACH.—The Director shall
21 publicly award prizes utilizing the Foundation's ex-
22 isting public affairs and public outreach resources.

23 (h) ADMINISTERING THE COMPETITION.—The Direc-
24 tor may enter into an agreement with a private, nonprofit

1 entity to administer the prize competition, subject to the
2 provisions of this section.

3 (i) INTELLECTUAL PROPERTY.—The Federal Gov-
4 ernment shall not, by virtue of offering or awarding a
5 prize under this section, be entitled to any intellectual
6 property rights derived as a consequence of, or in direct
7 relation to, the participation by a registered participant
8 in a competition authorized by this section. This sub-
9 section shall not be construed to prevent the Federal Gov-
10 ernment from negotiating a license for the use of intellec-
11 tual property developed for a prize competition under this
12 section.

13 (j) LIABILITY.—The Director may require a reg-
14 istered participant in a prize competition under this sec-
15 tion to waive liability against the Federal Government for
16 injuries and damages that result from participation in
17 such competition.

18 (k) NONSUBSTITUTION.—Any programs created
19 under this section shall not be considered a substitute for
20 Federal research and development programs.

21 (l) REPORTING REQUIREMENT.—Not later than 5
22 years after the date of enactment of this Act, the National
23 Science Board shall transmit to Congress a report con-
24 taining the results of a review and assessment of the pilot
25 program under this section, including—

- 1 (1) a description of the nature and status of all
2 completed or ongoing prize competitions carried out
3 under this section, including any scientific achieve-
4 ments, publications, intellectual property, or com-
5 mercialized technology that resulted from such com-
6 petitions;
- 7 (2) any recommendations regarding changes to,
8 the termination of, or continuation of the pilot pro-
9 gram;
- 10 (3) an analysis of whether the program is at-
11 tracting contestants more diverse than the Founda-
12 tion's traditional academic constituency;
- 13 (4) an analysis of whether public awareness of
14 innovation or of the goal of the particular prize or
15 prizes is enhanced;
- 16 (5) an analysis of whether the Foundation's
17 public image or ability to increase public scientific
18 literacy is enhanced through the use of innovation
19 inducement prizes; and
- 20 (6) an analysis of the extent to which private
21 funds are being used to support registered partici-
22 pants.
- 23 (m) EARLY TERMINATION OF CONTESTS.—The Di-
24 rector shall terminate a prize contest before any registered
25 participant wins if the Director determines that an unreg-

1 istered entity has produced an innovation that would oth-
2 erwise have qualified for the prize award.

3 (n) AUTHORIZATION OF APPROPRIATIONS.—

4 (1) IN GENERAL.—

5 (A) AWARDS.—There are authorized to be
6 appropriated to the Director for the period en-
7 compassing fiscal years 2011 through 2013
8 \$12,000,000 for carrying out this section.

9 (B) ADMINISTRATION.—Of the amounts
10 authorized in subparagraph (A), not more than
11 15 percent for each fiscal year shall be available
12 for the administrative costs of carrying out this
13 section.

14 (2) CARRYOVER OF FUNDS.—Funds appro-
15 priated for prize awards under this section shall re-
16 main available until expended, and may be trans-
17 ferred, reprogrammed, or expended for other pur-
18 poses as authorized by law only after the expiration
19 of 7 fiscal years after the fiscal year for which the
20 funds were originally appropriated. No provision in
21 this section permits obligation or payment of funds
22 in violation of section 1341 of title 31 of the United
23 States Code (commonly referred to as the Anti-Defi-
24 ciency Act).



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AMENDMENT TO THE COMMITTEE PRINT

OFFERED BY NEUGEBAUER OF TEXAS

Page 6, line 5, through page 7, line 18, strike sub-
sections (d) and (e).



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AMENDMENT TO THE COMMITTEE PRINT

OFFERED BY NEUGEBAUER OF TEXAS

Page 13, line 18, through page 14, line 4, strike
"Research areas may" and all that follows through "vir-
tual manufacturing."



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AMENDMENT TO THE COMMITTEE PRINT

OFFERED BY NEUGEBAUER OF TEXAS

Page 20, line 23, strike "SECTION 10 AMEND-
MENTS".

Page 21, lines 16 through 19, strike subsection (b).



**AMENDMENT TO THE COMMITTEE PRINT
OFFERED BY MS. EDDIE BERNICE JOHNSON OF
TEXAS**

At the end of title III, add the following new section:

1 **SEC. 308. UNDERGRADUATE BROADENING PARTICIPATION**
2 **PROGRAM.**

3 (a) UNDERGRADUATE BROADENING PARTICIPATION
4 PROGRAM.—The Foundation shall continue to support the
5 Historically Black Colleges and Universities Under-
6 graduate Program, the Louis Stokes Alliances for Minor-
7 ity Participation program, and the Tribal Colleges and
8 Universities Program as separate programs at least
9 through September 30, 2011.

10 (b) PLAN.—Prior to any realignment or consolidation
11 of the programs described in subsection (a), the Director
12 shall develop a plan clarifying the objectives and rationale
13 for such changes. The plan shall include a description of
14 how such changes would result in—

15 (1) meeting or strengthening the common goal
16 of the separate programs to increase the number of
17 individuals from underrepresented groups attaining
18 undergraduate STEM degrees; and

1 (2) addressing the unique needs of the different
2 types of minority serving institutions and underrep-
3 resented groups currently provided for by the sepa-
4 rate programs.

5 (c) RECOMMENDATIONS.—In the development of the
6 plan required under subsection (b), the Director shall at
7 a minimum—

8 (1) consider the recommendations and findings
9 of the National Academy of Sciences report required
10 by section 7032 of the America COMPETES Act
11 (Public Law 110–69); and

12 (2) solicit recommendations and feedback from
13 a wide range of stakeholders, including representa-
14 tives from minority serving institutions, other insti-
15 tutions of higher education, and other entities with
16 expertise on effective mechanisms to increase the re-
17 cruitment and retention of members of underrep-
18 resented groups in STEM fields, and the attainment
19 of STEM degrees by underrepresented groups.

20 (d) APPROVAL BY CONGRESS.—The plan developed
21 under this section shall be transmitted to Congress at least
22 3 months prior to the implementation of any realignment
23 or consolidation of the programs described in subsection
24 (a).



**AMENDMENT TO THE COMMITTEE PRINT
OFFERED BY MS. FUDGE OF OHIO**

At the end of title III, add the following new section:

1 **SEC. 308. GRAND CHALLENGES IN EDUCATION RESEARCH.**

2 (a) IN GENERAL.—The Director and the Secretary
3 of Education shall collaborate in—

4 (1) identifying, prioritizing, and developing
5 strategies to address grand challenges in research
6 and development on the teaching and learning of
7 STEM at the pre-K-12 level, in formal and informal
8 settings, for diverse learning populations, including
9 individuals identified in section 33 or 34 of the
10 Science and Engineering Equal Opportunities Act
11 (42 U.S.C. 1885a or 1885b); and

12 (2) ensuring the dissemination of the results of
13 such research and development.

14 (b) STAKEHOLDER INPUT.—In identifying the grand
15 challenges required in subsection (a), the Director and the
16 Secretary shall—

17 (1) take into consideration critical research
18 gaps identified in existing reports, including reports
19 by the National Academies, on the teaching and

1 learning of STEM at the pre-K-12 level in formal
2 and informal settings; and

3 (2) solicit input from a wide range of stake-
4 holders, including local and State education officials,
5 STEM teachers, STEM education researchers, sci-
6 entific and engineering societies, STEM faculty at
7 institutions of higher education, informal STEM
8 education providers, businesses with a large STEM
9 workforce, and other stakeholders in the teaching
10 and learning of STEM at the pre-K-12 level, and
11 may enter into an arrangement with the National
12 Research Council for these purposes.

13 (c) TOPICS TO CONSIDER.—In identifying the grand
14 challenges required in subsection (a), the Director and the
15 Secretary shall, at a minimum, consider the following top-
16 ics:

17 (1) Research on scalability, sustainability, and
18 replication of successful STEM activities, programs,
19 and models, in formal and informal environments.

20 (2) Research that utilizes a systems approach
21 to identifying challenges and opportunities to im-
22 prove the teaching and learning of STEM, including
23 development of model systems that support improved
24 teaching and learning of STEM across entire school
25 districts and States, and encompassing and inte-

1 grating the teaching and learning of STEM in for-
2 mal and informal venues, and in K-12 schools and
3 institutions of higher education.

4 (3) Research to understand what makes a
5 STEM teacher effective and STEM teacher profes-
6 sional development effective, including development
7 of tools and methodologies to measure STEM teach-
8 er effectiveness.

9 (4) Research and development on cyber-enabled
10 tools and programs and television based tools and
11 programs for learning and teaching STEM, includ-
12 ing development of tools and methodologies for as-
13 sessing cyber and television enabled teaching and
14 learning.

15 (5) Research and development on STEM teach-
16 ing and learning in informal environments, including
17 development of tools and methodologies for assessing
18 STEM teaching and learning in informal environ-
19 ments.

20 (6) Research and development on how inte-
21 grating engineering with mathematics and science
22 education may—

23 (A) improve student learning of mathe-
24 matics and science;

1 (B) increase student interest and persist-
2 ence in STEM; or

3 (C) improve student understanding of engi-
4 neering design principles and of the built world.

5 (d) REPORT TO CONGRESS.—Not later than 18
6 months after the date of enactment of this Act, the Direc-
7 tor and the Secretary shall report back to Congress with
8 a description of—

9 (1) the grand challenges identified pursuant to
10 this section;

11 (2) the role of each agency in supporting re-
12 search and development activities to address the
13 grand challenges;

14 (3) the common metrics that will be used to as-
15 sess progress toward meeting the grand challenges;

16 (4) plans for periodically updating the grand
17 challenges;

18 (5) how the agencies will disseminate the re-
19 sults of research and development activities carried
20 out under this section to STEM education practi-
21 tioners, to other Federal agencies that support
22 STEM programs and activities, and to non-Federal
23 funders of STEM education; and

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1 (6) how the agencies will support implementa-
2 tion of best practices identified by the research and
3 development activities.



**AMENDMENT TO THE COMMITTEE PRINT
OFFERED BY MR. TONKO OF NEW YORK**

At the end of title III, insert the following new section:

1 **SEC. 308. RESEARCH EXPERIENCES FOR UNDERGRADU-**
2 **ATES.**

3 (a) RESEARCH SITES.—The Director shall award
4 grants, on a merit-reviewed, competitive basis, to institu-
5 tions of higher education, nonprofit organizations, or con-
6 sortia of such institutions and organizations, for sites des-
7 ignated by the Director to provide research experiences for
8 10 or more undergraduate STEM students. The Director
9 shall ensure that—

10 (1) at least half of the students participating in
11 a program funded by a grant under this subsection
12 at each site shall be recruited from institutions of
13 higher education where research opportunities in
14 STEM are limited;

15 (2) the awards provide undergraduate research
16 experiences in a wide range of STEM disciplines;

17 (3) the awards support a variety of projects, in-
18 cluding independent investigator-led projects, inter-

1 disciplinary projects, and multi-institutional projects
2 (including virtual projects);

3 (4) students participating in each program
4 funded have mentors, including during the academic
5 year to the extent practicable, to help connect the
6 students' research experiences to the overall aca-
7 demic course of study and to help students achieve
8 success in courses of study leading to a bacca-
9 laurate degree in a STEM field;

10 (5) mentors and students are supported with
11 appropriate salary or stipends; and

12 (6) student participants are tracked, for em-
13 ployment and continued matriculation in STEM
14 fields, through receipt of the undergraduate degree
15 and for at least 3 years thereafter.

16 (b) INCLUSION OF UNDERGRADUATES IN STANDARD
17 RESEARCH GRANTS.—The Director shall require that
18 every recipient of a research grant from the Foundation
19 proposing to include 1 or more undergraduate students
20 in carrying out the research under the grant shall request
21 support, including stipend support, for such under-
22 graduate students as part of the research proposal itself
23 rather than as a supplement to the research proposal, un-

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- 1 less such undergraduate participation was not foreseeable
- 2 at the time of the original proposal.



PROCEEDINGS OF THE MARKUP BY THE SUBCOMMITTEE ON TECHNOLOGY AND INNOVATION ON COMMITTEE PRINT, NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY AUTHORIZATION ACT OF 2010

WEDNESDAY, APRIL 21, 2010

HOUSE OF REPRESENTATIVES,
SUBCOMMITTEE ON TECHNOLOGY AND INNOVATION,
COMMITTEE ON SCIENCE AND TECHNOLOGY,
Washington, DC.

The Committee met, pursuant to call, at 10:23 a.m., in Room 2318 of the Rayburn House Office Building, Hon. David Wu [Chairman of the Subcommittee] presiding.

Chairman WU. The Subcommittee will come to order. Pursuant to notice, the Subcommittee on Technology and Innovation meets to consider the following measure: the Committee Print, the National Institute of Standards and Technology Authorization Act of 2010. I recognize myself for an opening statement.

Welcome, everyone, for this morning's markup of the NIST [National Institute of Standards and Technology] portion of the America COMPETES bill.

When the Subcommittee went through this exercise in 2007, it was the first comprehensive authorization of NIST in 15 years. In the first version of COMPETES, we put NIST labs on a path to double its funding, and we replaced the 20-year-old Advanced Technology Program [ATP] with the Technology Innovation Program, or TIP, to focus on small high-tech entrepreneurial firms where technological innovation often occurs.

However, the first version of COMPETES largely maintained the status quo. This new bill moves us forward to focus NIST on meeting the measurement needs of the private sector, supporting competitiveness and creating jobs.

In the face of ever-increasing global technological and economic competition, it is our responsibility in Congress to support high-tech manufacturing in the United States. This bill authorizes robust funding for NIST to enable it to meet that goal. It maintains the commitment to double funding for the NIST labs and the Manufacturing Extension Partnership program, known as MEP, over ten years. It also provides authorization for TIP consistent with the vision laid out in the original COMPETES Act, enabling it to meet its existing obligations and fund up to \$40 million in new awards each year. This bill elevates the Director of NIST to the level of Under Secretary for Technology and Standards in order to inject NIST expertise into the Administration's discussions on innovation, standards and support for high-tech growth.

The current lab structure of ten operating units is 20 years old and no longer reflects today's technology sectors or the inherent and increasing multidisciplinary nature of technology. This bill authorizes a lab structure of six operating units to promote efficiency

and a cross-disciplinary culture at NIST. The bill also gives the NIST Director permission to modify the NIST structure, upon notification to Congress, as technology advances and the needs of the private sector change.

This legislation also structures the Manufacturing Extension Partnership to better address the challenges facing our small- and medium-sized manufacturers and the revenue challenges facing our states. The legislation requires MEP Centers to inform local and regional community colleges of the skill sets local manufacturers require in their workforce. It creates an innovative services initiative to help small manufacturing improve energy efficiency, use new technologies and manufacture high-tech products. It allows the Secretary, as he deems appropriate, to modify current cost-share requirements as state budgets come under increasing pressure.

This bill also creates a Bioscience Research Program at NIST to develop measurement tools and support research that will open new fields in the treatment of disease through personalized medical biologics.

After one Full Committee hearing and three Subcommittee hearings, my Subcommittee has a strong hearing record to support policy objectives for every element in this bill. We also circulated the bill text to the witnesses for their comments and suggestions, many of which have been incorporated.

I urge my colleagues to support this legislation.

With that, I will turn to my colleague, Mr. Smith, for his opening statement.

[The prepared statement of Chairman Wu follows:]

PREPARED STATEMENT OF CHAIRMAN DAVID WU

I want to, welcome everyone to this morning's mark-up of the NIST portion of the COMPETES bill.

When the Subcommittee went through this exercise in 2007, it was the first comprehensive authorization of NIST in 15 years. In the first version of COMPETES, we put NIST labs on a path to double their funding, and we replaced the 20-year-old Advanced Technology Program with the Technology Innovation Program, or TIP, to focus on small, high-tech entrepreneurial firms where technological innovation often occurs.

However, the first version of COMPETES largely maintained the status quo. This new bill Moves us forward to focus NEST on meeting the measurement needs of the private sector, supporting competitiveness, and creating jobs.

In the face of ever-increasing global technological and economic competition, it is our responsibility in Congress to support high-tech manufacturing in the United States. This bill authorizes robust funding for NIST to enable it to meet that goal. It maintains the commitment to double funding for the NIST labs and the Manufacturing Extension Partnership program—known as MEP—over 10 years. It also provides authorization for TIP consistent with the vision laid out in the original COMPETES Act, enabling it to meet its existing obligations and fund up to \$40 million in new awards each year. This bill elevates the Director of NEST to the level of Under Secretary for Technology and Standards in order to inject NEST expertise into the Administration's discussions on innovation, standards, and support for high-tech growth.

The current lab structure of 10 operating units is 20 years old and no longer reflects today's technology sectors or the inherent and increasing multi-disciplinary nature of technology. This bill authorizes a lab structure of six operating units to promote efficiency and a cross-disciplinary culture at NIST. The bill also gives the NEST Director permission to modify the NIST structure, upon notification to Congress, as technology advances and the needs of the private sector change.

This legislation also structures the Manufacturing Extension Partnership to better address the challenges facing our small- and medium-sized manufacturers and the revenue challenges facing our states. The legislation:

1. Requires MEP Centers to inform local and regional community colleges of the skill sets local manufacturers require in their workforce;
2. Creates an innovative services initiative to help small manufacturing improve energy efficiency, use new technologies, and manufacture high-tech products;
3. Allows the Secretary, as he deems appropriate, to Modify current cost-share requirements as state budgets come under increasing pressure.

The legislation also creates a bioscience research program at NIST to develop measurement tools and support research that will open new fields in the treatment of disease through personalized medical biologics.

After one, Full Committee hearing and three Subcommittee hearings, my Subcommittee has a strong hearing record to support its policy objectives for every element in this bill. We also circulated the bill text to the witnesses for their comments and suggestions, many of which have been incorporated.

I strongly urge my colleagues to support this legislation.

Mr. SMITH. Thank you, Chairman Wu, for calling today's markup of legislation to reauthorize the National Institute of Standards and Technology, NIST, which will be included in the America COMPETES reauthorization we are scheduled to mark up in the Full Committee next week.

I believe there is consensus on the major issues addressed in this bill but some questions remain, which I hope we can work through if not completely at this markup then certainly at the Full Committee markup.

NIST is certainly an important and trusted arbiter of standards, weights and measures. While the question of reauthorization level will be debated, there is no question reauthorization of NIST is vital to every sector of our economy. Given NIST's stature, it is appropriate we elevate the Director of NIST to be an Under Secretary of Commerce. In our recent hearing on NIST, our panelists from private industry agreed on this point provided the NIST Director is not saddled with new duties and continues to concentrate his efforts on running the agency. Likewise, in listening to the Director's testimony and given the constantly changing state of technology, I understand his desire to restructure the labs. He does not need Congressional authority to do as such, but I appreciate the chairman's desire to codify reorganization.

I hope that we will hold appropriate oversight hearings when the time is right to ensure this reorganization is adequately achieving NIST's mission, and I believe we share similar goals for the Manufacturing Extension Partnership and for NIST'S role in bioscience research, if not agreement on the structure of both programs as outlined in the bill.

With that, I look forward to a constructive markup today and working with you further to move toward Full Committee markup and floor consideration. I yield back.

[The prepared statement of Mr. Smith follows:]

PREPARED STATEMENT OF REPRESENTATIVE ADRIAN SMITH

Thank you, Chairman Wu, for calling today's markup of legislation to reauthorize the National Institute of Standards and Technology (NIST), which will be included in the America COMPETE's reauthorization we are scheduled to mark up in the fall committee next week.

I believe there is consensus on the major issues addressed in this bill, but some questions remain which I hope we can work through, if not completely at this markup, then at the Full Committee mark-up.

MST is an important and trusted arbiter of standards, weights, and measurers. While the question of reauthorization level will be debated, there is no question reauthorization of NIST is vital to every sector of our economy.

Given NIST's stature, it is appropriate we elevate the Director of NIST to be an Under Secretary of Commerce. In our recent hearing on NIST our panelists from private industry agreed on this point, provided the NIST director is not saddled with new duties and continues to concentrate his efforts on running the agency.

Likewise, in listening to the Director's testimony, and given the constantly changing state of technology, I understand his desire to restructure the labs. He does not need. Congressional authority to do such, but I appreciate the Chairman's desire to codify the reorganization. I hope that we will hold appropriate oversight hearings when the time is right to ensure this reorganization is adequately achieving NIST's mission.

And I believe we share similar goals for the Manufacturing Extension Partnership and for NIST's role in bioscience research, if not agreement on the structure of both programs as outlined in the bill.

With that, I look forward to a constructive markup today and to working with you further as move toward Full Committee markup and floor consideration.

I yield back the balance of my time.

Chairman WU. Thank you very much, Mr. Smith.

Does anyone else wish to be recognized for a statement?

[The prepared statement of Mr. Mitchell follows:]

PREPARED STATEMENT OF REPRESENTATIVE HARRY E. MITCHELL

Thank you, Mr. Chairman.

Today we will mark up the Committee Print of the National Institute of Standards and Technology Authorization Act.

The National Institute of Standards and Technology (NIST), a laboratory of the Department of Commerce, plays a crucial role in advancing U.S. innovation and industrial competitiveness by establishing measurement standards, calibration services, and quality assurance techniques that are critical to U.S. commerce.

Among other things, this legislation would establish a Bioscience Research Program at NIST, tasked with supporting the research and development of measurements, standards, methods, and other data to advance bioscience research, including biological drug research and development.

Establishing a system to bring low-cost, generic forms of biologic medicines to the market is critical. A pathway for "follow-on" biologics is important for treating various medical conditions, including illnesses for which no other treatments are currently available.

Furthermore, the support of basic measurement science research in the biomedical sector could lead to more accurate and efficient medical, testing as well as significant savings within the health care sector.

At this time, I yield back.

If not, I ask unanimous consent that the print be considered as read and open to amendment at any point and that the Members proceed with amendments in the order of the roster. Without objection, so ordered.

The first amendment on the roster is a Manager's Amendment offered by the Chair. The clerk will report the amendment.

The CLERK. Amendment number 271, Manager's Amendment to Committee Print, offered by Mr. Wu of Oregon.

Chairman WU. I ask unanimous consent to dispense with the reading. Without objection, so ordered. I recognize myself for five minutes to explain the amendment.

The Manager's Amendment makes two changes to section 3 of the Committee Print. First, it strikes the duties that were set out for the Under Secretary of Commerce. It also clarifies the duties that the Under Secretary is charged with carrying out are the duties as provided under the National Institute of Standards and Technology Act or as prescribed by the Secretary of Commerce. Our intent is to make the Director of NIST an Under Secretary but not

to make the Under Secretary responsible for additional duties separate and apart from his duties as Director of NIST. We are confident that the Director of NIST has the authority to, and is already carrying out, many of the duties that were specified in the Committee Print. As a result, in order to avoid any confusion, we have decided to strike the list of duties and clarify that the statutory responsibilities of the Under Secretary are the same as the statutory responsibilities of the Director of NIST.

The Manager's Amendment also makes changes to section 6 of the Committee Print. Section 6 will now establish a 50 percent cost share for the MEP program for fiscal years 2011 through 2015. This change will ease the cost-matching burden on MEP centers given the current economic troubles and the pinch on state budgets. The Secretary will also prepare a report giving recommendations on how to structure the cost-share mechanism moving past fiscal year 2015 guiding this Committee in its next reauthorization of America COMPETES.

I thank the minority for their good suggestions and urge adoption of the amendment.

Is there any further discussion of the amendment?

[The prepared statement of Chairman Wu follows:]

STATEMENT OF THE AMENDMENT SUBMITTED BY CHAIRMAN DAVID WU

The manager's amendment makes two changes to Section 3 of the Committee Print. First, it strikes the duties that were set out for the Under Secretary of Commerce. It also clarifies that the duties that the Under Secretary is charged with carrying out are the duties as provided for under the National Institute of Standards and Technology Act or as prescribed by the Secretary of Commerce.

Our intent is to make the Director of NIST an Under Secretary, but not to make the Under Secretary responsible for additional duties separate and apart from his duties as the Director of NIST. We are confident that the Director of NIST has the authority to, and is already carrying out, many of the duties that were specified in the Committee Print. As a result, in order to avoid any confusion, we have decided to strike the list of duties and clarify that the statutory responsibilities of the Under Secretary are the same as the statutory responsibilities of the Director of NIST.

The manager's amendment also makes changes to Section 6 of the Committee Print. Section 6 will now establish a 50 percent cost share for the MEP program for fiscal years 2011 through 2015. This change will ease the cost matching burden on MEP centers given the current economic troubles and pinched state budgets. The Secretary will also prepare a report giving recommendations on how to structure the cost share mechanism moving past fiscal year 2015, guiding this Committee in its next reauthorization of America COMPETES.

I thank the Minority for their good suggestions on this issue, and urge adoption of the amendment.

Mr. SMITH. Yes, Mr. Chairman

Chairman WU. The gentleman from Nebraska is recognized.

Mr. SMITH. Thank you, Mr. Chairman. I appreciate your willingness to address our concerns about assigning additional duties to the Under Secretary beyond his role as Director of NIST. I understand there may be some additional agreements reached on this section prior to the Full Committee markup and certainly thank you for that as well.

I do want to touch on the issue of the timing of some of this, and I appreciate the discussion I had with the Full Committee chairman, Chairman Gordon, prior to this, but I am going to withdraw a second-degree amendment that I planned to offer just so we can include this in the record. Given the timeline and so forth, and I don't want to get into all the details, but it has made it difficult

to actually work within what has been previously the practice of the Committee, which I have appreciated. So without going into all those details, I just hope that we can work through this, and with regard to the provision in front of us now, I certainly recognize these are tough economic times. I am concerned, however, if we do choose to alter the cost share in statute, we will have a very difficult time returning to the existing cost-share structure which has worked well for over 20 years certainly when the economy improves.

My amendment would have taken into account the current economic hardships that many MEP centers are facing by allowing the Secretary to make a determination as to when it is appropriate to adjust the non-federal cost share. This would have allowed an adjustment in times of economic hardship without expecting the Federal Government to permanently take on a greater share of the cost, and my amendment would have asked the Secretary to review how the new procedures and criteria are working out and provide options for adjusting the cost share in the future if it is still necessary.

The Manager's Amendment still does not address some of the concerns, and I would just ask if the manager and Chair are willing to work with us on a solution that might be acceptable to both sides as we do move forward.

Chairman WU. I thank the gentleman, and I thank the minority for its cooperation, and I want to assure the gentleman that we will work further to address any and all concerns on both sides, and with that, I would like to recognize the Chair of the Full Committee, the gentleman from Tennessee.

Chairman GORDON. Just very quickly, I want to once again apologize to Mr. Smith and his staff for an amendment coming in late. We are trying to do things the right way. I think we do 99 and a little bit percentage of that. So let me just say to our Democratic Members as well as minority Members, we will be going into a full markup next week, so, please, please, don't put us on the spot of getting something in late because you may not get it in late because we want to take this coming period—again, there has been no maliciousness, but when you have a big bill like this, there are inconsistencies, particularly when it comes out of three different subcommittees. That makes it more difficult. So let us all work together and try to get something that we are all going to be happy with 100 percent of the time next Wednesday.

Mr. SMITH. Would the gentleman yield?

Chairman GORDON. Certainly.

Mr. SMITH. Thank you, Chairman Gordon. I just want to appreciate your handling of this matter and I look forward to resolution. Thank you.

Chairman WU. I thank the Chairman and also want to again state that I want to thank Mr. Smith and cooperation on both sides on this.

Is there any further discussion of the Manager's Amendment? Then I urge adoption of the amendment. The vote now occurs on the Manager's Amendment. All in favor, say aye. Aye. Those opposed, say no. The ayes have it and the amendment is agreed to.

The second amendment on the roster is an amendment offered by the gentlelady from Maryland. Ms. Edwards, are you ready to proceed with your amendment?

Ms. EDWARDS. Thank you, Mr. Chairman. I have an amendment at the desk.

Chairman WU. The clerk will report the amendment.

The CLERK. Amendment number 270, amendment to the Committee Print offered by Ms. Edwards of Maryland.

Chairman WU. I ask unanimous consent to dispense with the reading. Without objection, so ordered.

I recognize the gentlelady from Maryland for five minutes to explain her amendment.

Ms. EDWARDS. Thank you, Mr. Chairman, and I am a first-born child and so if I am the offender, I want to make sure to apologize.

I do have an amendment that adds a new section, stating that the Director in evaluating applications for fellowships under section 18 and 19, the research fellowships and postdoctoral fellowships of NIST, shall give consideration to the goal of promoting participation of underrepresented minorities in research areas supported by the Institute.

Just yesterday, Mr. Chairman, I was with the superintendent of one of our school systems, in the week prior, another of our superintendents, some of the largest school systems actually in the country, and they talked about the value of a relationship with our research institutions and particularly NIST for the continuation of leadership and study and research with NIST in particular and how valuable that is to our educators both our high school educators, at our community college level and our university, and we heard testimony before our Full Committee and our Subcommittee about the importance of increasing postdoctoral participation in fellowships with our research institutions. We have also heard the sobering data about the number and the fewer number of minority students who are entering into these research fields, and so it is really important, I think, in terms of the amendment that I am offering today that we encourage the inclusion of underrepresented minorities in developing the next generation of science and technology experts, and this is an important amendment I think that will strengthen the bill. And the language of the amendment is giving priority consideration in particular to high-need schools. We recognize that in the areas of science and technology there are high-need schools all across our Congressional districts-across the country—but prioritizing those high-need schools or giving special consideration to those high-need schools is really important so that we can make sure that educators who are trying to reach some of our most vulnerable populations and encouraging them to participate in STEM [Science, Technology, Engineering, and Mathematics] fields and to further their education is really important.

So I would like to thank the Chairman for your support and especially thank the Committee staff for your help in working on this important amendment, and I look forward to—we have already had some engagement with the minority Members on some of the language of the amendment, which I really appreciate and look forward to the Full Committee consideration next week.

Chairman GORDON. Will the gentlelady yield?

Ms. EDWARDS. I will.

Chairman GORDON. Just very quickly, this is an excellent amendment. It has been based on our Committee record. And let me also say that you have set an exemplary mark for promptness in all that you have done, so your amendment was in in plenty of time and had plenty of time to be vetted, so thank you.

Ms. EDWARDS. Thank you, Mr. Chairman, and I yield.

Chairman WU. I thank the gentlelady for her explanation.

Is there any further discussion of the amendment? Mr. Broun.

Mr. BROUN. Thank you, Mr. Chairman.

I believe very strongly that discrimination is wrong. I have the same dream that Martin Luther King did, a fellow Georgian, that quality of character, not color of skin, should be what people are accepted about and how government looks upon them. Any kind of discrimination is wrong, whether it is discrimination for or against. We have many laws that are very discriminatory either positively or negatively. We are all supposed to be treated equal under the law. Everybody in this country, every human being is supposed to be treated equally under the law, and this amendment is counter to that basic philosophy that the American people generally hold across this country.

So I cannot support this amendment because it is discriminatory, and I hope that this Congress starting with this Committee can start doing what is right, and that is treating everybody in this country equally no matter what the color of the skin is, no matter what their gender is, no matter where their forefathers came from. We need to have everybody have an equal opportunity, and this amendment strikes very strongly against that, and so I cannot support it, will not support it, and I encourage my fellow Committee members to not support this amendment.

Thank you, Mr. Chairman. I yield back.

Chairman WU. I thank the gentleman.

Does anyone else wish to speak?

Chairman GORDON. Yes.

Chairman WU. The Chairman of the Full Committee, Mr. Gordon.

Chairman GORDON. I don't want to dwell on this too long. Certainly we all want to see that ultimate goal of the equity that you mentioned, Dr. Broun, but we all don't start off at the same starting block, and certainly we have to recognize, I think, that for some groups they were put in a hole in the past and we have to try to dig them out of that hole. And it is not just to be nice to someone. It is to help our country. We have had testimony time and time again on how it is important if we are going to move forward that we have to have greater skills in the STEM education area, and we have also learned over and over again that women and minorities, simply for a variety of reasons, either don't have the interest or don't have the scores, and if we are going to bring our country up, the quickest and best place that we can do that is by bumping up these minorities and women. And as that is done, then we will get everybody to the starting block and everyone will be equal and our country will be better off. This is not something we are doing for a group, this is something we are doing for our country, I think. I yield back my time.

Chairman WU. The gentleman from Mr. Nebraska, Mr. Smith.

Mr. SMITH. Thank you, Mr. Chairman. I thank Ms. Edwards for her efforts on this issue. I do have a concern in the language giving actual priority to teachers in high-need schools. I am sure every member here has such schools in their district, and I agree, we should be strengthening the teaching skills of all teachers. I am concerned the amendment would preclude teachers in other schools from participating, and I obviously would like to ensure from all schools remain eligible for the program.

And Ms. Edwards, I believe we have an agreement to change the priority language to special consideration. Is that accurate?

Ms. EDWARDS. That is correct, Mr. Smith.

Mr. SMITH. Thank you, and I believe that we can address this in the Full Committee, and I look forward to that. Thank you, Mr. Chairman.

Chairman WU. Thank you, Mr. Smith.

Is there any further discussion of this amendment? If not, the vote occurs on the amendment. All in favor, say aye. Aye. Those opposed, say no. The ayes have it and the amendment is agreed to.

Chairman WU. The third amendment on the roster is an amendment offered by the gentleman from Georgia. Mr. Broun, are you ready to proceed with your amendment?

Mr. BROUN. Yes, Mr. Chairman. Thank you. I have an amendment at the desk.

Chairman WU. The clerk will report the amendment.

The CLERK. Amendment number 263, amendment to the Committee Print offered by Mr. Broun of Georgia.

Chairman WU. I ask unanimous consent to dispense with the reading. Without objection, so ordered.

I recognize the gentleman from Georgia for five minutes to explain his amendment.

Mr. BROUN. Thank you, Mr. Chairman.

The amendment would help our Committee conduct a more effective oversight over NIST and the entire COMPETES program. It simply keeps intact the first 3 years of authorized spending through fiscal year 2013 but it strikes out the two-year funding levels for fiscal year 2014 and fiscal year 2015. It will reduce the authorized spending by \$2.4 billion. The three-year authorization level is consistent with the original 2007 COMPETES authorization, and with that authorization we found plenty to change.

According to CBO, the President's budget raises the deficit to \$1.5 trillion dollars in 2010, and a debt held by the public is ever growing. Additionally, this bill goes beyond the President's request. And in economic times such as now, why do we need to extend NIST authorization to five years? We don't. The fiscally responsible course to follow for our Committee is to keep NIST at a three-year authorization level. It makes sense to keep the authorization to three years since it is codifying a new reorganization of the NIST labs, and three years is a more adequate and appropriate time frame to see if the reauthorization is working. At the end of three years or beforehand, our Committee can always come back to the drawing board and assess how these agencies are living up to their commitments.

I urge the Committee to support this amendment, reducing the authorization for this NIST reauthorization to three years so that we can have the opportunity to review NIST progress at that time. Thank you, Mr. Chairman, and I yield back.

Chairman WU. I thank the gentleman. It is my intention to oppose the amendment. Many of the programs at NIST are long-term programs, and when I visited NIST facilities, I developed a deep appreciation for the very important research and other programs at NIST which have multiyear development time frames. In addition to the needs of the NIST programs for a longer authorization, predictability and stability, we also had testimony from our business community witnesses in our prior Subcommittee hearings that form an outside perspective it is highly preferable to have that predictability and a longer authorization period.

Does anyone else—Ms. Edwards.

Ms. EDWARDS. Thank you, Mr. Chairman.

I have the great privilege of representing the NIST facility in Maryland and have visited a couple of times, and one of the things that deeply impresses me with the professionalism at NIST is, it is one of the few areas of government where the charge is to look to the future, and I think it is really difficult to do that in two- and three-year stretches, and I believe that the longer authorization is needed precisely because we want the agency to focus on developing its tools, techniques, science and technology that really lasts us into the future, and I am opposed to this amendment. I think that there is nothing in our authorization that precludes this Committee and this Congress for offering the kind of oversight that we need, the work that is going on under the authorization, under the long-term authorization. There is nothing in the authorization that would preclude us from making inquiry and visiting NIST to explore what they are doing for the future and to have the ability to make any kind of changes we might need to in the interim.

So I support the ability of an agency like NIST in particular to focus its work under an authorization that it is secure in, and with that, I yield.

Chairman WU. Mr. Smith.

Mr. SMITH. Thank you, Mr. Chairman.

I do want to speak in favor of the amendment. I think that given our prior policy, and actually the need to continue to work on these issues in a very supportive manner, I think it is very reasonable and would certainly encourage the adoption of the amendment.

Mr. BROWN. Would the gentleman yield?

Mr. SMITH. Yes.

Mr. BROWN. I thank the gentleman for yielding, and I would like to ask the chairman a question, if I might, Mr. Chairman. Isn't it true that if we did a three-year authorization that even on these long-term projects we always come back and reauthorize them even two years from now or a year and a half from now or three years from now without having to go to a five-year authorization at this point?

Chairman WU. If the gentleman would yield?

Mr. BROWN. Yes, I yield.

Chairman WU. I thank the gentleman. While one can make assumptions about what would happen in the next reauthorization,

I think that there is a predictability which many seek in being able to go beyond one year or two years or three years. Obviously we don't want to stretch this out infinitely but given the balance that we must strike, a five-year reauthorization in my view is quite reasonable under the current circumstances, and I yield back to the gentleman.

Mr. BROUN. Well, I thank the chairman for his comments. I respectfully disagree. I think three years is a good balance between just reauthorizing it just a very short period of time and five-year authorization, and particularly in these hard economic times. We just simply don't have the money to continue to create more and more debt for our future generations in this country, and I think the American people are going to look at this and say this Congress just continues to spend money as if there is no tomorrow, and I think by restricting the reauthorization to three years, it is a great balance, and I would encourage members to support this amendment. It is one—NIST certainly is one of the few truly constitutional functions that Federal Government is engaged in doing. Most of what we do here in Washington is unconstitutional. We have no authorization under the Constitution according to the original intent to do a lot of the things that this Congress is doing, but NIST certainly is one of those that is authorized under the Constitution and we need to have a good, strong NIST, and I am a very strong supporter of a strong NIST, but again, I think a three-year authorization just makes sense and I encourage support of the amendment, and I yield back.

And I thank Mr. Smith for yielding. Yield back.

Mr. SMITH. Thank you. I will say, you know, in adding that this amendment I don't think stands in the way of being able to plan. In fact, I think it would encourage us to revisit the issues. We are lucky to get a one-year budget around here and I would suggest it needs to be a two-year budget. And that is just one issue, though, where let us take advantage of opportunities to continue to address issues, and I think that is why this amendment is reasonable and certainly I hope we can bring a resolution to this. Thank you.

Chairman WU. I thank the gentleman, and I believe that the Ranking Member of the Full Committee, the gentleman from Texas, wishes to—

Mr. HALL. Mr. Chairman, I will be brief. I support the amendment but I can count, and I know what is going to happen to it, and I remember what happened to it during this time, but we debated it for some time, but I thank the chairman for recognizing me. I yield back my time. I am ready to vote when you are.

Chairman WU. I thank the gentleman, and I believe that the gentlelady from Illinois wishes to be recognized on this amendment.

Ms. BIGGERT. Thank you, Mr. Chairman. I think that this is a very important issue and certainly NIST is very important and we have the opportunity, I think, in this Committee to really move the innovation, creativity ahead with all of the different projects. I am a little bit concerned that this maybe is a little bit too much, and what we are looking at is kind of a 10-year doubling path, and I know I have tried for years to get the Office of Science doubled and a lot of these projects, and it never worked out, but the way that

this is, is to take what—I think what you have done is to take the fiscal year 2010 as the baseline and then move it forward, which probably in comparison to a 10-year doubling period by the time you get to within the five years, you have authorized \$5,627,000 more than it would be if we were on a 10-year comparison. So, you know, I think we really are up a creek as far as spending and maybe we should take a little bit to spread it out. I am not for cutting at three years but really to change the level a little bit and make it 10 years rather than what you appear to do this in this bill. I would yield back.

Chairman WU. I thank the gentlelady, and the gentleman from New York.

Mr. TONKO. Thank you, Mr. Chairman.

Let me just speak against the amendment. I think that reducing the efforts here that are made in the reforms to NIST are absolutely essential, the stronger testing patterns, the more data information, the commitment to an investment here and what needs to be a high priority in this country. I will even reach to the prior amendment from the gentlelady from Maryland. We need to cultivate the science, the innovation, the technology early on. We need to measure our success. We need to commit to investments, and I think the stronger outcome is where we need to head. Innovation and industrial competitiveness just need to be the ruling dynamics of where we are investing today, and just cutting for the sake of cutting without prioritization is not going to get us where we need to arrive.

So I think that, as structured in this bill, is the appropriateness, and we should stay with the given intent.

Mr. SMITH. Would the gentleman yield?

Mr. TONKO. Yes.

Mr. SMITH. When you reference cutting, could you elaborate on that?

Mr. TONKO. Well, no, it is just I think that we need the testing patterns. We need to be able to view what we are doing with the programming. We need to make certain that we provide ample opportunity for everyone to utilize a program that I think really strengthens our industrial competitiveness, and I think that as it is structured is an appropriate response.

Mr. SMITH. Okay. Thank you. I just wanted to suggest that this is not a cutting measure, and certainly it is not as antagonistic of an amendment as it is perhaps being characterized, but I think it does allow us and charge us with the necessary function of revisiting the issue and I think maybe even contributing more support to the charge of the agency. I yield back.

Mr. TONKO. I was just referencing the cutting of the time frame. I just think that the more review we have, the better, the more opportunity to stretch our commitments here.

Chairman WU. The gentleman yields back.

Is there any further discussion of this amendment? If not, the vote occurs on the amendment. All in favor, say aye. Aye. Those opposed, say no. No. The no's have it.

Mr. BROUN. Mr. Chairman.

Chairman WU. The gentleman from Georgia.

Mr. BROUN. Request a recorded vote, please, sir.

Chairman WU. A recorded vote is requested. The clerk will call the roll.

The CLERK. Chairman Wu?

Chairman WU. No.

The CLERK. Chairman Wu votes no. Ms. Edwards?

Ms. EDWARDS. No.

The CLERK. Ms. Edwards votes no. Mr. Luján?

Mr. LUJÁN. No.

The CLERK. Mr. Luján votes no. Mr. Tonko?

Mr. TONKO. No.

The CLERK. Mr. Tonko votes no. Mr. Mitchell?

Mr. MITCHELL. No.

The CLERK. Mr. Mitchell votes no. Mr. Peters?

[No response.]

The CLERK. Mr. Garamendi?

Mr. GARAMENDI. No.

The CLERK. Mr. Garamendi votes no. Mr. Gordon?

Chairman GORDON. No.

The CLERK. Mr. Gordon votes no. Mr. Smith?

Mr. SMITH. Yes.

The CLERK. Mr. Smith votes aye. Mrs. Biggert?

Ms. BIGGERT. Aye.

The CLERK. Mrs. Biggert votes aye. Mr. Akin?

Mr. AKIN. Yes.

The CLERK. Mr. Akin votes aye. Mr. Broun?

Mr. BROUN. Aye.

The CLERK. Mr. Broun votes aye. Mr. Hall?

Mr. HALL. Aye.

The CLERK. Mr. Hall votes aye.

Chairman WU. Does anyone else wish to be recorded? If not, the clerk will report.

The CLERK. Mr. Chairman, five Members vote aye and seven Members vote no.

Chairman WU. The amendment is not agreed to.

tions that NIST's current standards and guidelines should directly or indirectly be mandated for the private sector. While there is broad agreement that there is an appropriate role for NIST in assisting the private sector improve the security of its systems, regulating private cybersecurity practices could be counterproductive to our security goals. I fully realize this is not the chairman's intent and the language in the bill does not do this, but my amendment would ensure this remains clear by explicitly stating use of NIST's security standards and guidelines outside the Federal Government shall be voluntary.

With that, I would ask my colleagues to support this amendment and I yield back the balance of my time.

Chairman WU. I thank the gentleman.

Is there any further discussion of this amendment? If not, then the vote occurs on the amendment. All in favor, say aye. All opposed, say no. In the opinion of the Chair, the ayes have it and the amendment is agreed to.

The fifth amendment on the roster is an amendment offered by the gentleman from New Mexico. Mr. Luján, are you ready to proceed with your amendment?

Mr. LUJÁN. Yes, Mr. Chairman. I have an amendment at the desk.

Chairman WU. The clerk will report the amendment.

The CLERK. Amendment number 047, amendment to the Committee Print offered by Mr. Luján of New Mexico.

Chairman WU. I ask unanimous consent to dispense with the reading. Without objection, so ordered.

I recognize the gentleman from New Mexico for five minutes to explain his amendment.

Mr. LUJÁN. Thank you, Mr. Chairman.

Innovation has always been a hallmark of American success, and the United States has the best research facilities and educational institutions in the world, and we continue to be a leader in developing cutting-edge technology in fields spanning from renewable energy to medicine. But our ability to ensure that our country is globally competitive relies on our ability to educate our students and equip them with the skills they need to succeed in the jobs of the future. This is especially true for minority students who are often underrepresented in science, technology, engineering and math fields.

The bioscience research program established in this bill will support the development of standards and measurements to advance biological and medical technology. The university research centers will advance this program by conducting hands-on research and testing activities under the skills of students trained in STEM fields at educational institutions selected through a competitive application process.

My amendment today adds a new section to University Research Centers Program that requires the director of the program to give special consideration to applications from minority-serving institutions. We must make a commitment to restore science and innovation as keys to the new American economy. Innovation is the future for our Nation, and together we must ensure that our minority students are trained to be scientists and engineers and prepare to become part of the workforce for the 21st century.

I urge my colleagues to support my amendment. Thank you, Mr. Chairman. I yield back my time.

[The prepared statement of Mr. Luján follows:]

PREPARED STATEMENT OF REPRESENTATIVE BEN R. LUJÁN

Thank you Mr. Chairman.

Innovation has always been a hallmark of American success. The United States has the best research facilities and educational institutions in the world, and we continue to be a leader in developing cutting edge technology in fields spanning from renewable energy to medicine. But our ability to ensure that our country is globally competitive relies on our ability to educate our students and equip them with the skills they need to succeed in the jobs of the future. This is especially true for minority students, who are often underrepresented in science, technology, engineering and math fields. Minority students have unique learning needs and our Minority Serving Institutions are designed to ensure that these students have the support they need to succeed.

The Bioscience Research Program established in this bill will support the development of standards and measurements to advance biological and medical technology. The University Research Centers will advance this program by conducting hands-on research and testing activities using the skills of students trained in STEM fields at educational institutions selected through a competitive application process. My amendment today adds a new section to the University Research Centers program

that requires the Director of the program to give special consideration to applications from Minority Serving Institutions.

We must make a commitment to restore science and innovation as the keys to a new American economy. Innovation is the future for our nation. And, together we must ensure that our minority students are trained to be scientists and engineers and prepared to become part of the workforce for the 21st century. I urge my colleagues to support my amendment, thank you Mr. Chairman.

Chairman WU. I thank the gentleman.

Does anyone wish to be recognized?

Mr. SMITH. Mr. Chairman, I have an amendment at the desk. I am sorry. I misstated.

Chairman WU. Does anyone on this side wish to make further statement? I would like to recognize then the gentleman from California.

Mr. GARAMENDI. A question. This issue was heavily debated in another subcommittee having to do with the hub systems and the way in which this kind of language would apply, and I think the issue needs to be brought up once again in this context. I suspect the words "special consideration"—what is special consideration here? And how do these Bioscience Research Centers work in that regard? Again, it was heavily debated, a long discussion on it, and there was some language approved in another subcommittee on this issue. I am just kind of curious if this is coordinated with that issue or it this—how does this work?

Mr. LUJÁN. Will the gentleman yield?

Mr. GARAMENDI. Yes.

Mr. LUJÁN. If we could ask staff for a specific definition as well on the bioresearch program that will be established and so then we can get into how some of the minority-serving institutions for collaborative purposes would be given special consideration to be able to provide partnerships as we are seeking to enact programs that would strengthen STEM fields specifically.

Ms. COUNSEL. Hi. Well, I can't speak to the definition of special condition. I can speak to the Bioscience Research Program. What the legislation does is establish a Bioscience Research Program to support research and development of standard reference materials, measurements, methods and genomic and other data to advance biomedical science.

Mr. LUJÁN. So, Mr. Chairman, as we see institutions from around the country where there are underrepresented populations, specifically in STEM where we continue to see areas where we are underperforming as we strengthen NIST, as we look to other areas that we can encourage STEM growth, I think it is very important that we provide that stable footing as with one of the other amendments that was provided today to take into consideration how we do have underrepresented areas that require special consideration to be able to advance additional partnerships, and that is what this would be encouraging, which is consistent with the debate that we had before which I think we will be taking up with Full Committee markup as well.

Thank you, Mr. Chairman.

Mr. GARAMENDI. The issue, if I might, the issue of special consideration, is that a direction to the director to do these programs at one or another of these universities regardless of their current capability of doing the program?

Mr. LUJÁN. If the gentleman would yield? Mr. Chairman, as the amendment says, if you look at page 24 after line 8, “insert the following: the director shall give special consideration to the application for an institution of higher education, that is” and they are outlined with the rest of the amendments. Now, Mr. Chairman, I would hope that as we look to strengthen our universities and we look for partnerships that we are able to bring in schools that have the opportunity and possibility in populations throughout the country where we can make sure that we are moving this forward.

Chairman WU. If the gentleman from New Mexico would yield?

Chairman GORDON. If the gentleman would yield?

Mr. LUJÁN. Yes.

Chairman GORDON. I think the answer to the question is not mandatory, if that is your question. It is not mandatory.

Chairman WU. And the gentleman from New Mexico yields back. Does anyone else wish to—the gentlelady from Illinois.

Ms. BIGGERT. Thank you, Mr. Chairman. I think that this is a very important discussion as far as what the definition of special consideration and it seems that the counsel does not have one, and talk about the director shall, you know, any time you use the word “shall” that speaks of mandates, not being voluntary. I think that we really need to—someplace there has to be a definition of special consideration. It could be—you know, we were just talking about this before with priority. Is that different than priority? Is that different than just consideration itself? If we are going to, you know, do policy, we need to really make sure that we define those kind of terms, you know, like reasonable doubt, whatever on these things that this whole amendment seems to fall on just the special consideration and nobody can give a definition. I yield back.

Chairman WU. I thank the gentlelady. My understanding is that the discussion in the other subcommittee was about an amendment which was offered and then withdrawn, and there is no further development there. The gentleman from Nebraska.

Mr. SMITH. Thank you, Mr. Chairman. I appreciate Mr. Luján’s work on this amendment. In looking at all of the language in the base bill and so forth, we just want to be consistent in addition to perhaps defining so that we are all on the same page. You know, I think that this is one of the most important topics that this Congress can bring attention to in terms of what our country needs, how we can compete in the world and offer young people an opportunity for the future and not only providing them opportunity but in resolving the challenges that we face economically and otherwise. So I would just ask that we maybe take an opportunity to iron this out before Full Committee markup because of, I think some ambiguities that do exist.

Chairman WU. I thank the gentleman, and I think that that is a positive suggestion to further elaborate on or to at least work on at both a Member and a staff level whether further definition of this terminology is necessary.

Are there any other Members who wish to speak to this amendment?

Mr. LUJÁN. Mr. Chairman, just quickly. I mean, as we talk about the question of ambiguity, I guess I would support having a discussion if additional language is needed. It doesn’t appear to me that

the ambiguity associated with trying to encourage treatment, to encourage areas where we know that there are needs. We see science, technology, engineering, mathematics performance and scoring in institutions with Native American populations young and old, Native Americans need additional assistance. Across the area, there is equal underrepresented scoring and performance with science, technology, engineering and mathematics and lack of representation with African Americans, Hispanics, Latinos, and this is an area where I would hope that it is not a partisan issue. I hope it is something that we can definitely work on to help achieve and to make sure that we are truly helping to lift this country, move it forward, strengthen the economy, look to many of those that can provide the support that we need so that we have the capacity for engineering and mathematics in this country. It is very clear that companies are continuing to look to outsource some of these needs, and we need to look to see how we can strengthen our system domestically as well so that way we can look to help provide the workforce that we need and—

Ms. BIGGERT. Will the gentleman yield?

Chairman WU. I want to thank the gentleman for his comments, and I just want to note that the Chair used his discretion to make a small bend in the procedure, and I will either yield myself such time so that I can yield to the gentleman from New Mexico for further comments or some other Member might, but right now the gentleman from California is recognized for comment.

Mr. GARAMENDI. Thank you, Mr. Chairman. The gentleman from New Mexico is quite correct in the basic argument that he is making that we need to encourage more minorities to be involved in science, engineering and technical matters. These universities that are specified in this particular language clearly have the population that should be interested and should have the opportunity to engage in those activities.

I am just concerned about how best to get those institutions involved in it. I know this debate was going on in another subcommittee, so this is seen in several different parts of the overarching legislation. We need to coordinate the various sections to achieve the goal. In the previous subcommittee, the discussion came down to partnerships with universities that had traditionally been receiving these kinds of research grants, that their application might score higher if it engaged these minority institutions in one way or another or the minority institution might be partnering with. It is not clear in this language that that is achieved, and I would suggest that we really delve into this in some detail because the thrust of this amendment is appropriate. How to achieve it in coordination with the other subcommittees is I think the concern here.

Ms. BIGGERT. Will the gentleman yield?

Mr. GARAMENDI. Yes. I am quite finished and yield back and done.

Ms. BIGGERT. I appreciate the gentleman from California's remarks, and I think that we all really—this is not a partisan issue. This really is to make sure if we are going to make this work just to get it right. If you look at—the Secretary looks at this as well, now, what do I do. I think that we need to be a little bit more—

have a little more either legislative intent or some changes to this following the discussion in the other subcommittee. I think this needs to be clarified. I appreciate the chairman, and—

Mr. SMITH. Will the gentlelady yield?

Ms. BIGGERT. I would yield to—

Mr. SMITH. I guess would the gentleman yield?

Ms. BIGGERT. I guess the gentleman from California would have to.

Mr. GARAMENDI. Yes, I yield everything. I am finished.

Mr. SMITH. Thank you. I do want to touch on the fact that there is some language in the NSF title that is inconsistent with the language of the amendment. I don't know if it is Mr. Luján's intent to change that, if he might elaborate on what his objective is. We just want to make sure that we have got consistent language here, if you would wish to elaborate on that or we can discuss it off the record as well.

Mr. LUJÁN. Well, if the gentleman would yield, I think the Chairman has clearly said that this is something we can bring forward. There is other legislation before us with NSF [National Science Foundation] which is not the NIST bill and they are two different pieces of legislation to come before the Committee. I appreciate the dialogue and the discussion associated with the legislative intent associated with special consideration as we move forward of the treatment of universities or those institutions that may be included for special consideration or other appropriate language to make sure that we are truly looking at underrepresented communities to bring them forward.

Chairman WU. The gentleman from California's time has completely expired now, and I think that it is fair to say that given the discussion in several different subcommittees that we will be taking a close look and working to find appropriate further elaboration of the terminology.

Mr. SMITH. Mr. Chairman, I just want to say that I look forward to resolving this issue. Thank you.

Chairman WU. Thank you.

Is there any further discussion of this? The gentlelady from Maryland.

Ms. EDWARDS. Thank you, Mr. Chairman.

I just wanted to clarify from Mr. Luján and, you know, I really appreciate the amendment that he has offered today. I mean, it is just no great secret that when everything seems as though it is, you know, fair across the board that for whatever reasons minority-serving institutions do not enjoy the benefits of receiving these research opportunities, and I suppose we could go into a long history about that but, you know, the facts are true. We can see it in the numbers. We can see it in the research grants. And so there is great need to make sure that the agency is making itself, you know, known to these institutions and really considering the institutions in making grants.

I would note that there is nothing in the amendment that actually—in the base bill that would change the obligation under the University Research Centers for whatever institution is awarded funding to comply with what other institutions have to do to comply to be a university-based research center. I mean, there is noth-

ing about that. It is only saying to, I think, and perhaps Mr. Luján could clarify but it is only saying to the agency, it is really up to you to make sure, to make certain that along with meeting these basic criteria that you are considering all of these institutions which have for many different reasons and for a long time been absent from participating as research centers.

And so is my understanding correct, Mr. Luján, that there is nothing that precludes the agency or prohibits the agency from using the exact same criteria that it would use to evaluate any other research organization?

Mr. LUJÁN. Mr. Chairman, I don't think that could have been explained any better.

Ms. EDWARDS. Thank you, and with that I yield.

Chairman WU. I thank the gentlelady.

Is there any further discussion of this amendment? If not, the vote occurs on the amendment. All in favor, say aye. Aye. Those opposed, say no. The ayes have it and the amendment is agreed to.

Are there any other amendments to the bill? If not, the vote is on the Committee Print as amended. All those in favor will say aye. Aye. All those opposed will say no. In the opinion of the Chair, the ayes have it, and I recognize myself to offer a motion.

I move that the Subcommittee favorably report the Committee Print as amended to the Full Committee. Furthermore, I move that staff be instructed to prepare the Subcommittee Report and make necessary technical and conforming changes to the print in accordance with the recommendations of the Subcommittee.

The question occurs on the motion to report the print favorably. Those in favor of the motion will signify by saying aye. Aye. Those opposed will say no. The ayes have it and the print is favorably reported.

Without objection, the motion to reconsider is laid upon the table. Members will have two calendar days in which to submit supplemental minority or additional views on this measure.

And I want to thank all the Members for their attendance and participation, and this concludes our Subcommittee markup. The Subcommittee is adjourned.

[Whereupon, at 11:19 a.m., the Subcommittee was adjourned.]

Appendix:

COMMITTEE PRINT, SECTION-BY-SECTION ANALYSIS, AMENDMENT
ROSTER

[Committee Print]

APRIL 16, 2010

111TH CONGRESS
2D SESSION**H. R.**

To reauthorize the National Institute of Standards and Technology, and
for other purposes.

IN THE HOUSE OF REPRESENTATIVES

M. _____ introduced the following bill; which was referred to the
Committee on _____

A BILL

To reauthorize the National Institute of Standards and
Technology, and for other purposes.

1 *Be it enacted by the Senate and House of Representa-*
2 *tives of the United States of America in Congress assembled,*

3 **SECTION 1. SHORT TITLE.**

4 This Act may be cited as the “National Institute of
5 Standards and Technology Authorization Act of 2010”.

6 **SEC. 2. AUTHORIZATION OF APPROPRIATIONS.**

7 (a) FISCAL YEAR 2011.—

1 (1) IN GENERAL.—There are authorized to be
2 appropriated to the Secretary of Commerce
3 \$1,012,100,000 for the National Institute of Stand-
4 ards and Technology for fiscal year 2011.

5 (2) SPECIFIC ALLOCATIONS.—Of the amount
6 authorized under paragraph (1)—

7 (A) \$620,000,000 shall be authorized for
8 scientific and technical research and services
9 laboratory activities;

10 (B) \$125,000,000 shall be authorized for
11 the construction and maintenance of facilities;
12 and

13 (C) \$267,100,000 shall be authorized for
14 industrial technology services activities, of
15 which—

16 (i) \$116,000,000 shall be authorized
17 for the Technology Innovation Program
18 under section 28 of the National Institute
19 of Standards and Technology Act (15
20 U.S.C. 278n);

21 (ii) \$141,100,000 shall be authorized
22 for the Manufacturing Extension Partner-
23 ship program under sections 25 and 26 of
24 such Act (15 U.S.C. 278k and 278l); and

1 (iii) \$10,000,000 shall be authorized
2 for the Malcolm Baldrige National Quality
3 Award program under section 17 of the
4 Stevenson-Wydler Technology Innovation
5 Act of 1980 (15 U.S.C. 3711a).

6 (b) FISCAL YEAR 2012.—

7 (1) IN GENERAL.—There are authorized to be
8 appropriated to the Secretary of Commerce
9 \$1,035,400,000 for the National Institute of Stand-
10 ards and Technology for fiscal year 2012.

11 (2) SPECIFIC ALLOCATIONS.—Of the amount
12 authorized under paragraph (1)—

13 (A) \$657,200,000 shall be authorized for
14 scientific and technical research and services
15 laboratory activities;

16 (B) \$85,000,000 shall be authorized for
17 the construction and maintenance of facilities;
18 and

19 (C) \$293,200,000 shall be authorized for
20 industrial technology services activities, of
21 which—

22 (i) \$132,000,000 shall be authorized
23 for the Technology Innovation Program
24 under section 28 of the National Institute

1 of Standards and Technology Act (15
2 U.S.C. 278n);

3 (ii) \$150,900,000 shall be authorized
4 for the Manufacturing Extension Partner-
5 ship program under sections 25 and 26 of
6 such Act (15 U.S.C. 278k and 278l); and

7 (iii) \$10,300,000 shall be authorized
8 for the Malcolm Baldrige National Quality
9 Award program under section 17 of the
10 Stevenson-Wydler Technology Innovation
11 Act of 1980 (15 U.S.C. 3711a).

12 (c) FISCAL YEAR 2013.—

13 (1) IN GENERAL.—There are authorized to be
14 appropriated to the Secretary of Commerce
15 \$1,137,809,000 for the National Institute of Stand-
16 ards and Technology for fiscal year 2013.

17 (2) SPECIFIC ALLOCATIONS.—Of the amount
18 authorized under paragraph (1)—

19 (A) \$696,700,000 shall be authorized for
20 scientific and technical research and services
21 laboratory activities;

22 (B) \$122,000,000 shall be authorized for
23 the construction and maintenance of facilities;
24 and

1 (C) \$319,109,000 shall be authorized for
2 industrial technology services activities, of
3 which—

4 (i) \$147,000,000 shall be authorized
5 for the Technology Innovation Program
6 under section 28 of the National Institute
7 of Standards and Technology Act (15
8 U.S.C. 278n);

9 (ii) \$161,500,000 shall be authorized
10 for the Manufacturing Extension Partner-
11 ship program under sections 25 and 26 of
12 such Act (15 U.S.C. 278k and 278l); and

13 (iii) \$10,609,000 shall be authorized
14 for the Malcolm Baldrige National Quality
15 Award program under section 17 of the
16 Stevenson-Wydler Technology Innovation
17 Act of 1980 (15 U.S.C. 3711a).

18 (d) FISCAL YEAR 2014.—

19 (1) IN GENERAL.—There are authorized to be
20 appropriated to the Secretary of Commerce
21 \$1,188,277,000 for the National Institute of Stand-
22 ards and Technology for fiscal year 2014.

23 (2) SPECIFIC ALLOCATIONS.—Of the amount
24 authorized under paragraph (1)—

1 (A) \$738,500,000 shall be authorized for
2 scientific and technical research and services
3 laboratory activities;

4 (B) \$124,000,000 shall be authorized for
5 the construction and maintenance of facilities;
6 and

7 (C) \$325,727,000 shall be authorized for
8 industrial technology services activities, of
9 which—

10 (i) \$142,000,000 shall be authorized
11 for the Technology Innovation Program
12 under section 28 of the National Institute
13 of Standards and Technology Act (15
14 U.S.C. 278n);

15 (ii) \$172,800,000 shall be authorized
16 for the Manufacturing Extension Partner-
17 ship program under sections 25 and 26 of
18 such Act (15 U.S.C. 278k and 278l); and

19 (iii) \$10,927,000 shall be authorized
20 for the Malcolm Baldrige National Quality
21 Award program under section 17 of the
22 Stevenson-Wydler Technology Innovation
23 Act of 1980 (15 U.S.C. 3711a).

24 (e) FISCAL YEAR 2015.—

1 (1) IN GENERAL.—There are authorized to be
2 appropriated to the Secretary of Commerce
3 \$1,255,955,000 for the National Institute of Stand-
4 ards and Technology for fiscal year 2015.

5 (2) SPECIFIC ALLOCATIONS.—Of the amount
6 authorized under paragraph (1)—

7 (A) \$782,800,000 shall be authorized for
8 scientific and technical research and services
9 laboratory activities;

10 (B) \$133,000,000 shall be authorized for
11 the construction and maintenance of facilities;
12 and

13 (C) \$340,155,000 shall be authorized for
14 industrial technology services activities, of
15 which—

16 (i) \$144,000,000 shall be authorized
17 for the Technology Innovation Program
18 under section 28 of the National Institute
19 of Standards and Technology Act (15
20 U.S.C. 278n);

21 (ii) \$184,900,000 shall be authorized
22 for the Manufacturing Extension Partner-
23 ship program under sections 25 and 26 of
24 such Act (15 U.S.C. 278k and 278l); and

1 (iii) \$11,255,000 shall be authorized
2 for the Malcolm Baldrige National Quality
3 Award program under section 17 of the
4 Stevenson-Wydler Technology Innovation
5 Act of 1980 (15 U.S.C. 3711a).

6 **SEC. 3. UNDER SECRETARY OF COMMERCE FOR STAND-**
7 **ARDS AND TECHNOLOGY.**

8 (a) IN GENERAL.—Section 5 of the Stevenson-
9 Wydler Technology Innovation Act of 1980 (15 U.S.C.
10 3704) is amended—

11 (1) in the heading, by striking “**EXPERI-**
12 **MENTAL PROGRAM TO STIMULATE COMPETI-**
13 **TIVE**” and inserting “**STANDARDS AND**”;

14 (2) in the heading in subsection (a), by striking
15 “PROGRAM ESTABLISHMENT” and inserting “ES-
16 TABLISHMENT OF EXPERIMENTAL PROGRAM TO
17 STIMULATE COMPETITIVE TECHNOLOGY”;

18 (3) by redesignating subsections (a) through (c)
19 as subsections (b) through (d), respectively; and

20 (4) by inserting before subsection (b), as so re-
21 designated, the following:

22 “(a) UNDER SECRETARY OF COMMERCE FOR STAND-
23 ARDS AND TECHNOLOGY.—

24 “(1) ESTABLISHMENT.—

1 “(A) IN GENERAL.—There shall be in the
2 Department of Commerce an Under Secretary
3 of Commerce for Standards and Technology
4 who shall serve as the Director of the National
5 Institute of Standards and Technology and per-
6 form such duties as provided for in law and as
7 the Secretary shall prescribe.

8 “(B) APPOINTMENT.—The Under Sec-
9 retary of Commerce for Standards and Tech-
10 nology shall be appointed by the President by
11 and with the advice and consent of the Senate
12 and shall be compensated at the rate now or
13 hereafter provided for level III of the Executive
14 Schedule Pay Rates (5 U.S.C. 5314).

15 “(C) APPLICABILITY.—The individual serv-
16 ing on the date of enactment of the National
17 Institute of Standards and Technology Author-
18 ization Act of 2010 as the Director of the Na-
19 tional Institute of Standards and Technology
20 shall also serve as the Under Secretary of Com-
21 merce for Standards and Technology until such
22 time as a successor is appointed under subpara-
23 graph (B).

1 “(2) DUTIES.—The Secretary, acting through
2 the Under Secretary of Commerce for Standards
3 and Technology, as appropriate, shall—

4 “(A) conduct policy analysis on innovation
5 and technical standards to improve and pro-
6 mote United States competitiveness in the con-
7 text of global competition;

8 “(B) propose and support studies, in co-
9 operation with other Federal agencies, to evalu-
10 ate the effectiveness of measures for improving
11 Federal Government technology transfer poli-
12 cies and initiatives;

13 “(C) provide that cooperative efforts to
14 stimulate competitiveness, job creation, and in-
15 novation be undertaken between the Under Sec-
16 retary and other officials in the Department of
17 Commerce responsible for such areas as trade
18 and economic assistance;

19 “(D) support the creation of partnerships
20 and other joint initiatives by State or local gov-
21 ernments, regional organizations, private busi-
22 nesses, institutions of higher education, non-
23 profit institutions, or Federal laboratories to
24 encourage technology transfer and innovation;

1 “(E) conduct research and support activi-
2 ties to improve training programs and curricula
3 for high-tech manufacturing skills and related
4 skill sets and encourage the dissemination of
5 best practices involving appropriate Federal
6 agencies, State or local governments, regional
7 organizations, institutions of higher education,
8 or nonprofit institutions; and

9 “(F) serve as a focal point for discussions
10 among United States companies on topics of in-
11 terest regarding technology innovation, competi-
12 tiveness, and job retention and creation.”.

13 (b) CONFORMING AMENDMENTS.—

14 (1) STEVENSON-WYDLER.—Subsection (c) of
15 section 5 of such Act (15 U.S.C. 3704), as redesign-
16 nated in subsection (a)(3), is amended to read as
17 follows:

18 “(c) COORDINATION.—To the extent practicable, in
19 carrying out subsection (b), the Secretary shall coordinate
20 the program established under such subsection with other
21 programs of the Department of Commerce.”.

22 (2) TITLE 5, UNITED STATES CODE.—

23 (A) LEVEL III.—Section 5314 of title 5,
24 United States Code, is amended by inserting

1 before the item “Associate Attorney General”
2 the following:

3 “Under Secretary of Commerce for Standards
4 and Technology, the incumbent of which also serves
5 as Director of the National Institute of Standards
6 and Technology.”.

7 (B) LEVEL IV.—Section 5315 of title 5,
8 United States Code, is amended by striking
9 “Director, National Institute of Standards and
10 Technology, Department of Commerce.”.

11 (3) NIST ACT.—Section 5 of the National In-
12 stitute of Standards and Technology Act (15 U.S.C.
13 274) is amended by striking the following: “The Di-
14 rector shall be compensated at the rate in effect for
15 level IV of the Executive Schedule under section
16 5315 of title 5, United States Code.”.

17 **SEC. 4. REORGANIZATION OF NIST LABORATORIES.**

18 (a) ORGANIZATION.—The Director shall reorganize
19 the scientific and technical research and services labora-
20 tory program into the following operational units:

21 (1) The Physical Measurement Laboratory,
22 whose mission is to realize and disseminate the na-
23 tional standards for length, mass, time and fre-
24 quency, electricity, temperature, force, and radiation
25 by activities including fundamental research in

1 measurement science, the provision of measurement
2 services and standards, and the provision of testing
3 facilities resources for use by the Federal Govern-
4 ment.

5 (2) The Information Technology Laboratory,
6 whose mission is to develop and disseminate stand-
7 ards, measurements, and testing capabilities for
8 interoperability, security, usability, and reliability of
9 information technologies, including cybersecurity
10 standards and guidelines for Federal agencies,
11 United States industry, and the public, through fun-
12 damental and applied research in computer science,
13 mathematics, and statistics.

14 (3) The Engineering Laboratory, whose mission
15 is to develop and disseminate advanced manufac-
16 turing and construction technologies to the United
17 States manufacturing and construction industries
18 through activities including measurement science re-
19 search, performance metrics, tools for engineering
20 applications, promotion of green infrastructure, and
21 energy efficiency measurements and standards.

22 (4) The Material Measurement Laboratory,
23 whose mission is to serve as the national reference
24 laboratory in biological, chemical, and material
25 sciences and engineering through activities including

1 fundamental research in the composition, structure,
2 and properties of biological and environmental mate-
3 rials and processes, the development of certified ref-
4 erence materials and critically evaluated data, and
5 other programs to assure measurement quality in
6 materials and biotechnology fields.

7 (5) The Center for Nanoscale Science and
8 Technology, a national shared-use facility for
9 nanoscale fabrication and measurement, whose mis-
10 sion is to develop innovative nanoscale measurement
11 and fabrication capabilities to support researchers
12 from industry, institutions of higher education, the
13 National Institute of Standards and Technology, and
14 other Federal agencies in nanoscale technology from
15 discovery to production.

16 (6) The NIST Center for Neutron Research, a
17 national shared-use facility, whose mission is to pro-
18 vide neutron-based measurement capabilities to re-
19 searchers from industry, institutions of higher edu-
20 cation, the National Institute of Standards and
21 Technology, and other Federal agencies in support
22 of materials research, nondestructive evaluation,
23 neutron imaging, chemical analysis, neutron stand-
24 ards, dosimetry, and radiation metrology.

25 (b) REVISION.—

1 (1) IN GENERAL.—Subsequent to the reorga-
2 nization required under subsection (a), the Director
3 may revise the organization of the scientific and
4 technical research and services laboratory program.

5 (2) REPORT TO CONGRESS.—Any revision to
6 the organization of such program under paragraph
7 (1) shall be submitted in a report to the Committee
8 on Science and Technology of the House of Rep-
9 resentatives and the Committee on Commerce,
10 Science, and Transportation of the Senate at least
11 60 days before the effective date of such revision.

12 **SEC. 5. FEDERAL GOVERNMENT STANDARDS AND CON-**
13 **FORMITY ASSESSMENT COORDINATION.**

14 (a) COORDINATION.—Section 2(b) of the National In-
15 stitute of Standards and Technology Act (15 U.S.C.
16 272(b)) is amended—

17 (1) in paragraph (12), by striking “and” after
18 the semicolon;

19 (2) in paragraph (13), by striking the period at
20 the end and inserting a semicolon; and

21 (3) by adding after paragraph (13) the fol-
22 lowing:

23 “(14) to promote collaboration among Federal
24 departments and agencies and private sector stake-
25 holders in the development and implementation of

1 standards and conformity assessment frameworks to
2 address specific Federal Government policy goals;
3 and

4 “(15) to convene Federal departments and
5 agencies, as appropriate, to—

6 “(A) coordinate and determine Federal
7 Government positions on specific policy issues
8 related to international technical standards and
9 conformity assessment-related activities; and

10 “(B) coordinate Federal department and
11 agency engagement in the development of inter-
12 national technical standards and conformity as-
13 sessment-related activities.”.

14 (b) REPORT.—The Director, in consultation with ap-
15 propriate Federal agencies, shall submit a report annually
16 to Congress addressing the Federal Government’s tech-
17 nical standards and conformity assessment-related activi-
18 ties. The report shall identify—

19 (1) current and anticipated international stand-
20 ards and conformity assessment-related issues that
21 have the potential to impact the competitiveness and
22 innovation capabilities of the United States;

23 (2) any action being taken by the Federal Gov-
24 ernment to address these issues and the Federal
25 agency taking that action; and

1 (3) any action that the Director is taking or
2 will take to ensure effective Federal Government en-
3 gagement on technical standards and conformity as-
4 sessment-related issues, as appropriate, where the
5 Federal Government is not effectively engaged.

6 **SEC. 6. MANUFACTURING EXTENSION PARTNERSHIP.**

7 (a) **COMMUNITY COLLEGE SUPPORT.**—Section 25(a)
8 of the National Institute of Standards and Technology Act
9 (15 U.S.C. 278k(a)) is amended—

10 (1) in paragraph (4), by striking “and” after
11 the semicolon;

12 (2) in paragraph (5), by striking the period at
13 the end and inserting “; and”; and

14 (3) by adding after paragraph (5) the following:

15 “(6) providing to community colleges informa-
16 tion about the job skills needed in small- and me-
17 dium-sized manufacturing businesses in the regions
18 they serve.”.

19 (b) **INNOVATIVE SERVICES INITIATIVE.**—

20 (1) **IN GENERAL.**—Section 25 of such Act (15
21 U.S.C. 278k) is amended by adding at the end the
22 following:

23 “(g) **INNOVATIVE SERVICES INITIATIVE.**—

24 “(1) **ESTABLISHMENT.**—The Director may es-
25 tablish, within the Centers program under this sec-

1 tion, an innovative services initiative to assist small-
2 and medium-sized manufacturers in—

3 “(A) reducing their energy usage and envi-
4 ronmental waste to improve profitability; and

5 “(B) accelerating the domestic commer-
6 cialization of new product technologies, includ-
7 ing components for renewable energy systems.

8 “(2) MARKET DEMAND.—The Director may not
9 undertake any activity to accelerate the domestic
10 commercialization of a new product technology
11 under this subsection unless an analysis of market
12 demand for the new product technology has been
13 conducted.”

14 (2) GRANTS.—Section 33 of such Act (15
15 U.S.C. 278r) is amended by adding at the end the
16 following:

17 “(g) INNOVATIVE SERVICES.—The Director may
18 make awards under this section to carry out the innovative
19 services initiative under section 25(g).”

20 (c) REPORTS.—Section 25 of such Act (15 U.S.C.
21 278k) is further amended by adding at the end the fol-
22 lowing:

23 “(h) REPORTS.—

24 “(1) IN GENERAL.—In submitting the 3-year
25 programmatic planning document and annual up-

1 dates under section 23, the Director shall include an
2 assessment of the Director's governance of the pro-
3 gram established under this section.

4 “(2) CRITERIA.—In conducting such assess-
5 ment, the Director shall use the criteria established
6 pursuant to the Malcolm Baldrige National Quality
7 Award under section 17(d)(1)(C) of the Stevenson-
8 Wydler Technology Innovation Act of 1980 (15
9 U.S.C. 3711a(d)(1)(C)).”

10 (d) HOLLINGS MANUFACTURING EXTENSION PART-
11 NERSHIP PROGRAM COST-SHARING.—Section 25(c) of
12 such Act (15 U.S.C. 278k(c)) is amended—

13 (1) in paragraph (1), by inserting “, unless oth-
14 erwise determined under paragraph (3)(C)” before
15 the period at the end;

16 (2) in paragraph (3)—

17 (A) in subparagraph (B)—

18 (i) by striking “not less than 50 per-
19 cent of the costs incurred for the first 3
20 years and an increasing share for each of
21 the last 3 years” and inserting “the appli-
22 cant's share of the costs incurred (in this
23 subsection referred to as ‘cost share’)”;
24 and

1 (ii) by striking “For purposes of the
2 preceding sentence, the” and inserting
3 “The”;

4 (B) by redesignating subparagraphs (C)
5 and (D) as subparagraphs (D) and (E), respec-
6 tively;

7 (C) by inserting after subparagraph (B)
8 the following new subparagraph:

9 “(C) The Secretary shall by rule establish
10 appropriate criteria to be considered in deter-
11 mining a Center’s cost share. A Center’s cost
12 share shall in no case exceed 50 percent of the
13 costs incurred by such Center. The Secretary
14 shall review each Center’s cost share annually
15 and at such other times as the Secretary con-
16 siders appropriate. An adjustment to a Center’s
17 cost share in a year shall not affect the amount
18 of Federal funds such Center receives in such
19 year.”; and

20 (D) in subparagraph (D), as redesignated
21 by subparagraph (B)—

22 (i) by striking “50 percent” and in-
23 serting “cost share”; and

1 (ii) by striking “Center’s contribu-
2 tion” and inserting “Center’s cost share”;
3 and

4 (3) in paragraph (5)—

5 (A) in the sixth sentence, by striking “at
6 declining levels”; and

7 (B) in the last sentence—

8 (i) by striking “Funding” and insert-
9 ing “Unless otherwise determined under
10 paragraph (3)(C), funding”; and

11 (ii) by striking “one third” and insert-
12 ing “50 percent”.

13 (e) ADVISORY BOARD.—Section 25(e)(4) of such Act
14 (15 U.S.C. 278k(e)(4)) is amended to read as follows:

15 “(4) FEDERAL ADVISORY COMMITTEE ACT AP-
16 PPLICABILITY.—

17 “(A) IN GENERAL.—In discharging its du-
18 ties under this subsection, the MEP Advisory
19 Board shall function solely in an advisory ca-
20 pacity, in accordance with the Federal Advisory
21 Committee Act.

22 “(B) EXCEPTION.—Section 14 of the Fed-
23 eral Advisory Committee Act shall not apply to
24 the MEP Advisory Board.”.

1 (f) DEFINITIONS.—Section 25 of such Act (15 U.S.C.
2 278k) is further amended by adding at the end the fol-
3 lowing:

4 “(i) DEFINITION.—In this section, the term ‘commu-
5 nity college’ means an institution of higher education (as
6 defined under section 101(a) of the Higher Education Act
7 of 1965 (20 U.S.C. 1001(a))) at which the highest degree
8 that is predominately awarded to students is an associate’s
9 degree.”.

10 **SEC. 7. BIOSCIENCE RESEARCH PROGRAM.**

11 (a) IN GENERAL.—The National Institute of Stand-
12 ards and Technology Act (15 U.S.C. 271 et seq.) is
13 amended—

14 (1) by redesignating section 34 as section 35;
15 and

16 (2) by inserting after section 33 the following:

17 **“SEC. 34. BIOSCIENCE RESEARCH PROGRAM.**

18 “(a) IN GENERAL.—The Director shall establish a
19 bioscience research program to support research and de-
20 velopment of standard reference materials, measurements,
21 methods, and genomic and other data to advance—

22 “(1) biological drug research and development;

23 “(2) molecular diagnostics;

24 “(3) medical imaging technologies; and

25 “(4) personalized medicine.

1 “(b) UNIVERSITY RESEARCH CENTERS.—

2 “(1) ESTABLISHMENT.—The Director may es-
3 tablish research centers at institutions of higher edu-
4 cation (in this section referred to as ‘university re-
5 search centers’) through a competitive application
6 process to conduct research that furthers the objec-
7 tives of the bioscience research program.

8 “(2) APPLICATION.—

9 “(A) IN GENERAL.—An institution of high-
10 er education seeking to establish a university
11 research center under this subsection shall sub-
12 mit an application to the Director at such time,
13 in such manner, and containing such informa-
14 tion and assurances as the Director may re-
15 quire.

16 “(B) COMPONENTS.—The application shall
17 include, at a minimum, a description of—

18 “(i) the relevant research and instruc-
19 tional capacity of the applicant;

20 “(ii) the research projects that will be
21 undertaken by the applicant;

22 “(iii) the extent to which the applicant
23 will partner with industry and the role in-
24 dustry will play in the research undertaken
25 by the university research center;

1 “(iv) how the applicant will dissemi-
2 nate research results effectively; and

3 “(v) the metrics that will be used to
4 evaluate the success of the projects under
5 clause (ii) and the contribution of the uni-
6 versity research center in furthering the
7 objectives of the bioscience research pro-
8 gram.

9 “(3) ASSESSMENT.—Not later than 3 years
10 after the date on which a university research center
11 is established and every 3 years thereafter, the Di-
12 rector shall evaluate the university research center
13 for its contributions to the bioscience research pro-
14 gram.

15 “(4) ANNUAL MEETING.—If the Director estab-
16 lishes more than 1 university research center, the
17 Director shall convene an annual meeting of re-
18 searchers from all of the university research centers
19 and the Institute to foster collaboration and commu-
20 nication.

21 “(c) USER FACILITY.—The Director may establish a
22 bioscience user facility to provide access to advanced or
23 unique equipment, services, materials, and other resources
24 to industry, institutions of higher education, nonprofit or-

1 ganizations, and government agencies to perform research
2 and testing.

3 “(d) POSTDOCTORAL FELLOWS.—The Director shall,
4 to the extent practicable, assign 1 or more fellows from
5 the postdoctoral fellowship program established in section
6 19 to the bioscience research program.

7 “(e) PROGRAMMATIC PLANNING DOCUMENT.—The
8 Director shall ensure that the updates to the pro-
9 grammatic planning document transmitted to Congress
10 under section 23(d) include the bioscience research pro-
11 gram.

12 “(f) DEFINITIONS.—In this section:

13 “(1) BIOSCIENCE RESEARCH PROGRAM.—The
14 term ‘bioscience research program’ means the re-
15 search and development program authorized under
16 subsection (a).

17 “(2) INSTITUTION OF HIGHER EDUCATION.—
18 The term ‘institution of higher education’ has the
19 same meaning given the term in section 101(a) of
20 the Higher Education Act of 1965 (20 U.S.C.
21 1001(a)).”

22 (b) VISITING COMMITTEE ON ADVANCED TECH-
23 NOLOGY AMENDMENTS.—Section 10 of the National Insti-
24 tute of Standards and Technology Act (15 U.S.C. 278)
25 is amended—

1 (1) in subsection (a)—

2 (A) by striking “15 members” and insert-
3 ing “at least 15, but not more than 20, mem-
4 bers”; and

5 (B) by striking “at least 10” and inserting
6 “at least 13”; and

7 (2) in subsection (h)(1), by striking “Program
8 established under section 28” and inserting “pro-
9 grams established under sections 28 and 34”.

10 **SEC. 8. TIP ADVISORY BOARD.**

11 Section 28(k)(4) of the National Institute of Stand-
12 ards and Technology Act (15 U.S.C. 278n(k)(4)) is
13 amended to read as follows:

14 “(4) FEDERAL ADVISORY COMMITTEE ACT AP-
15 PPLICABILITY.—

16 “(A) IN GENERAL.—In discharging its du-
17 ties under this subsection, the TIP Advisory
18 Board shall function solely in an advisory ca-
19 pacity, in accordance with the Federal Advisory
20 Committee Act.

21 “(B) EXCEPTION.—Section 14 of the Fed-
22 eral Advisory Committee Act shall not apply to
23 the TIP Advisory Board.”.

24 **SEC. 9. DEFINITIONS.**

25 In this Act:

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1 (1) DIRECTOR.—The term “Director” means
2 the Director of the National Institute of Standards
3 and Technology.

4 (2) FEDERAL AGENCY.—The term “Federal
5 agency” has the meaning given such term in section
6 4 of the Stevenson-Wydler Technology Innovation
7 Act of 1980 (15 U.S.C. 3703).

SECTION-BY-SECTION ANALYSIS OF
NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY
REAUTHORIZATION ACT OF 2010

Section 1. Short Title

National Institute of Standards and Technology Reauthorization Act of 2010.

Section 2. Authorization of Appropriations

Authorizes a total of \$5.628 billion for the National Institute of Standards and Technology (NIST) for FY2011 through FY 2015. The total consists of authorization levels of \$1.012 billion in FY 2011, \$1.035 billion in FY 2012, \$1.137 billion in FY 2013, \$1.188 billion in FY 2014, and \$1.256 billion in FY 2015.

Includes within the total authorization a total of \$3.495 billion for NIST labs for FY 2011 through FY 2015. The total for NIST labs consists of authorization levels of \$620.0 million in FY 2011, \$657.2 million in FY 2012, \$696.7 million in FY 2013, \$738.5 million in FY 2014, and \$782.8 million in FY 2015.

Includes within the total authorization a total of \$589 million for construction and maintenance of facilities for FY 2011 through FY 2015. The total for construction and maintenance consists of authorization levels of \$125 million for FY 2011, \$85 million for FY 2012, \$122 million for FY 2013, \$124 million for FY 2014, and \$133 million for FY 2015.

Includes within the total authorization \$1.545 billion for industrial technology services for FY 2011 through FY 2015, which includes a total of \$681 million for the Technology Innovation Program (TIP), a total of \$811.2 million for the Manufacturing Extension Partnership (MEP) program, and a total of \$53.1 million for the Malcolm Baldrige National Quality Award program. The total for TIP consists of authorization levels of \$116 million for FY 2011, \$132 million for FY 2012, \$147 million for FY 2013, \$142 million for FY 2014, and \$144 million for FY 2015. The total for MEP consists of authorization levels of \$141.1 million for FY 2011, \$150.9 million for FY 2012, \$161.5 million for FY 2013, \$172.8 million for FY 2014, and \$184.9 million for FY 2015. The total for the Malcolm Baldrige National Quality Award program includes authorization levels for \$10 million for FY 2011, \$10.3 million for FY 2012, \$10.6 million for FY 2013, \$10.9 million for FY 2014, and \$11.3 million for FY 2015.

Section 3. Under Secretary of Commerce for Standards and Technology

Creates the Office of the Under Secretary of Commerce for Standards and Technology. The current Director of the NIST would become the Under Secretary until a successor is appointed. (This is the same structure as at the National Oceanic and Atmospheric Administration (NOAA)).

The duties of the Under Secretary/NIST Director are focused on improving U.S. competitiveness and innovation through:

- 1) Policy analysis studies on innovation and technical standards;
- 2) Studies that evaluate the effectiveness of measures for improving Federal technical transfer policies and initiatives;
- 3) Cooperative efforts between the Under Secretary and other Department of Commerce officials responsible for trade and economic assistance being undertaken to stimulate competitiveness, job creation, and innovation;
- 4) Supporting the creation of hubs, clusters, centers, and other joint initiatives by state or local governments, regional organizations, private businesses, universities, non-profits, or Federal labs. The focus of these initiatives are technology transfer and innovation;
- 5) Supporting activities to improve training programs and curricula for high-tech manufacturing skills; and
- 6) Serving as a focal point for U.S. companies to discuss Federal policies on innovation, competitiveness, and job creation and retention.

Section 4. Reorganization of NIST Laboratories

Organizes the NIST labs into the following operational units:

- 1) The Physical Measurement Lab, whose mission is to develop and maintain the national standards for length, mass, time, frequency, electricity, temperature, force, radiation, and developing standards policy;
- 2) The Information Technology Lab, whose mission and focus is developing standards and testing for interoperability, security, usability, and reliability

of information technologies (IT) and communications technologies working with industry;

- 3) The Engineering Lab, whose mission is to develop and disseminate advance manufacturing and construction technologies, including performance metrics and technical standards for green infrastructure and energy efficiency, to the U.S. manufacturing and construction industries;
- 4) The Material Measurement Lab, whose mission is to serve as the national reference lab in biological, chemical, and material sciences and engineering;
- 5) The Center for Nanoscale Science and Technology, a nationally shared facility-for use by industry, institutions of higher education, and Federal agencies (including NIST), whose mission is to develop innovative nanoscale measurement and fabrication capabilities; and
- 6) The NIST Center for Neutron Research, a nationally shared facility for use by industry, institutions of higher education, and Federal agencies (including NIST), whose mission is to provide neutron-based measurement capabilities for materials research, non-destructive evaluation, neutron imaging, chemical analysis, neutron standards, dosimetry, and radiation metrology.

Allows the Director to make future changes to the NIST laboratory structure, provided he submit a report to Congress before implementing such change.

Section 5. Federal Government Standards and Conformity Assessment Coordination

Assigns the Director of NIST the responsibility to convene Federal departments and agencies to coordinate Federal Government policy goals and engagement on international technical standards and conformity assessment-related activities working with industry and standards development organizations.

Requires the Director to submit a report to Congress which addresses current and anticipated international standards issues with the potential to impact U.S. competitiveness and innovation capabilities, actions taken by the Federal Government to address these issues, and any action the Director is taking or will take to ensure effective Federal Government engagement on technical standards and conformity assessment-related issues.

Section 6. Manufacturing Extension Partnership

Updates the Manufacturing Extension Partnership (MEP) program:

- 1) Adds to the MEP mission to provide information to local community colleges on the job skill sets needed by local/regional small- and medium-sized manufacturers;
- 2) Creates an innovation services initiative to assist small- and medium-sized manufacturers to reduce their energy usage and environmental waste; accelerate the domestic commercialization of new product technologies (including components of renewable energy systems); and ensures that there is market demand for these new product technologies. Expands a current MEP grant program to fund these activities at local MEP Centers;
- 3) Requires NIST to assess its governance of the MEP program using the criteria of the Malcolm Baldrige National Quality Award;
- 4) Allows the Secretary to modify a Center's cost share provisions as the Secretary deems appropriate; and
- 5) Exempts the MEP Advisory Board from Section 14 of the Federal Advisory Committee Act (FACA), 'Termination of advisory committees; renewal; continuation.'

Section 7. Bioscience Research Program

This program establishes a Bioscience Research Program at NIST to support the development of standard reference materials and measurements to advance biological drug research and development, molecular diagnostics, medical imaging technology, and personalized medicine.

The Director may also establish University Research Centers (which can include industry partners) through a competitive application process to conduct research that furthers the objectives of the bioscience research program. It requires that, not later than 3 years after any University Research Center is established, the Director evaluate each center for its contribution to the bioscience research program.

The program allows the Director to establish a user facility for industry, institutions of higher education, nonprofit organizations, and government agencies in order to perform research and testing, providing access to advanced or unique equipment, services, materials, and other resources.

Changes the number of NIST's Visiting Committee on Advanced Technology members to vary between 15 and 20 and requiring at least 13 of those members to be from U.S. industry.

Section 8. Advisory Board

Exempts the Technology Innovation Program (TIP) Advisory Board from Section 14 of FACA.

Section 9. Definitions

Defines the terms 'Director' and 'Federal Agency.'

COMMITTEE ON SCIENCE AND TECHNOLOGY
TECHNOLOGY AND INNOVATION
SUBCOMMITTEE MARKUP
April 21, 2010

AMENDMENT ROSTER

Committee Print – National Institute of Standards and Technology
Authorization Act of 2010

No.	Sponsor	Description	Results
1	Mr. Wu (Manager's Amendment)	<p>Makes several technical and clarifying changes to the Committee Print.</p> <p>Amends Section 6 ("Manufacturing Extension Partnership"), subsection (d) ("Hollings Manufacturing Extension Partnership Program Cost-Sharing"), to state that for fiscal years 2011 through 2015, the Secretary "may not provide to a [Regional Center for the Transfer of Manufacturing Technology] more than 50 percent of the costs incurred by such Center and may not require that a Center's cost share exceed 50 percent." Also requires that the Secretary submit to Congress, no later than four years after enactment, a report on cost share under the program.</p>	Agreed to by voice vote.
2	Ms. Edwards (270)	<p>Adds a new section to the Committee Print ("Underrepresented Minorities") stating that the Director, in evaluating applications for fellowships under Sections 18 ("Research Fellowships") and 19 ("Post-Doctoral Fellowship Program") of the NIST Act, "shall give consideration to the goal of promoting participation of underrepresented minorities in research areas supported by the Institute."</p> <p>Amends Section 19A(c) of the NIST Act ("Teacher Science and Technology Enhancement Institute Program") to direct the Director to "give priority to an application from a teacher from a high-</p>	Agreed to by voice vote.

		need school, as defined in section 200 of the Higher Education Act of 1965...”	
3	Mr. Broun (263)	Strikes authorizations of appropriations for fiscal years 2014 and 2015.	Defeated by roll call vote: Y-5 N-7
4	Mr. Smith (269)	Adds a new section to the Committee Print (“Cybersecurity Standards and Guidelines”) stating that “Cybersecurity standards and guidelines developed by the National Institute of Standards and Technology for use by United States industry and the public shall be voluntary.”	Agreed to by voice vote.
5	Mr. Luján (047)	Amends Section 7 (“Bioscience Research Program”) to require that the Director, in reviewing applicants seeking to establish a university research center, give special consideration to an application from an institution of higher education that is: an 1890 Institution; a Predominantly Black Institution; a part B institution; a Tribal College or University; a Native American-serving, non-tribal institution; an Asian American and Native American Pacific Islander-serving institution; an Alaska native-serving institution; a Native Hawaii-serving institution; or a Hispanic-serving institution.	Agreed to by voice vote.

**MANAGER'S AMENDMENT TO COMMITTEE PRINT
OFFERED BY MR. WU OF OREGON**

Amend section 3(a)(4) to read as follows:

1 (4) by inserting before subsection (b), as so re-
2 designated, the following:

3 “(a) UNDER SECRETARY OF COMMERCE FOR STAND-
4 ARDS AND TECHNOLOGY.—

5 “(1) ESTABLISHMENT.—There shall be in the
6 Department of Commerce an Under Secretary of
7 Commerce for Standards and Technology who shall
8 serve as the Director of the National Institute of
9 Standards and Technology and perform such duties
10 as provided for in the National Institute of Stand-
11 ards and Technology Act (15 U.S.C. 271 et seq.)
12 and as the Secretary shall prescribe.

13 “(2) APPOINTMENT.—The Under Secretary of
14 Commerce for Standards and Technology shall be
15 appointed by the President by and with the advice
16 and consent of the Senate and shall be compensated
17 at the rate now or hereafter provided for level III of
18 the Executive Schedule Pay Rates (5 U.S.C. 5314).

19 “(3) APPLICABILITY.—The individual serving
20 on the date of enactment of the National Institute

1 of Standards and Technology Authorization Act of
2 2010 as the Director of the National Institute of
3 Standards and Technology shall also serve as the
4 Under Secretary of Commerce for Standards and
5 Technology until such time as a successor is ap-
6 pointed under paragraph (2).”.

Amend section 6(d) to read as follows:

7 (d) HOLLINGS MANUFACTURING EXTENSION PART-
8 NERSHIP PROGRAM COST-SHARING.—Section 25(c) of
9 such Act (15 U.S.C. 278k(e)) is amended by adding at
10 the end the following:

11 “(7) Notwithstanding paragraphs (1), (3), and
12 (5), for fiscal year 2011 through fiscal year 2015,
13 the Secretary may not provide to a Center more
14 than 50 percent of the costs incurred by such Center
15 and may not require that a Center’s cost share ex-
16 ceed 50 percent.

17 “(8) Not later than 4 years after the date of
18 enactment of the National Institute of Standards
19 and Technology Authorization Act of 2010, the Sec-
20 retary shall submit to Congress a report on the cost
21 share requirements under the program. The report
22 shall—

23 “(A) discuss various cost share structures,
24 including the cost share structure in place prior

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1 to such date of enactment and the cost share
2 structure in place under paragraph (7), and the
3 effect of such cost share structures on indi-
4 vidual Centers and the overall program; and

5 “(B) include a recommendation for how
6 best to structure the cost share requirement
7 after fiscal year 2015 to provide for the long-
8 term sustainability of the program.



AMENDMENT TO COMMITTEE PRINT
OFFERED BY MS. EDWARDS OF MARYLAND

At the appropriate place in the bill, insert the following new section:

1 **SEC. ____ . UNDERREPRESENTED MINORITIES.**

2 (a) RESEARCH FELLOWSHIPS.—Section 18 of the
3 National Institute of Standards and Technology Act (15
4 U.S.C. 278g-1) is amended by adding at the end the fol-
5 lowing:

6 “(c) UNDERREPRESENTED MINORITIES.—In evalu-
7 ating applications for fellowships under this section, the
8 Director shall give consideration to the goal of promoting
9 the participation of underrepresented minorities in re-
10 search areas supported by the Institute.”.

11 (b) POSTDOCTORAL FELLOWSHIP PROGRAM.—Sec-
12 tion 19 of such Act (15 U.S.C. 278g-2) is amended by
13 adding at the end the following:

14 “In evaluating applications for fellowships under this sec-
15 tion, the Director shall give consideration to the goal of
16 promoting the participation of underrepresented minori-
17 ties in research areas supported by the Institute.”.

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1 (c) TEACHER DEVELOPMENT.—Section 19A(e) of
2 such Act (15 U.S.C. 278g-2a(e)) is amended by adding
3 at the end the following:

4 “The Director shall give priority to an application from
5 a teacher from a high-need school, as defined in section
6 200 of the Higher Education Act of 1965 (20 U.S.C.
7 1021).”.



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AMENDMENT TO COMMITTEE PRINT

OFFERED BY MR. BROWN
OF GEORGIA

In section 2, strike subsections (d) and (e).



AMENDMENT TO COMMITTEE PRINT

**OFFERED BY MR. A. SMITH
OF NEBRASKA**

At the appropriate place in the bill, insert the following new section:

- 1 **SEC. ____ . CYBERSECURITY STANDARDS AND GUIDELINES.**
- 2 Cybersecurity standards and guidelines developed by
- 3 the National Institute of Standards and Technology for
- 4 use by United States industry and the public shall be vol-
- 5 untary.



AMENDMENT TO COMMITTEE PRINT
OFFERED BY MR. LUJÁN OF NEW MEXICO

Page 24, after line 8, insert the following:

1 “(C) SPECIAL CONSIDERATION.—The Di-
2 rector shall give special consideration to an ap-
3 plication from an institution of higher education
4 that is—

5 “(i) an 1890 Institution, as defined in
6 section 2 of the Agricultural Research, Ex-
7 tension, and Education Reform Act of
8 1998 (7 U.S.C. 7061);

9 “(ii) a Predominantly Black Institu-
10 tion, as defined in section 318 of the High-
11 er Education Act of 1965 (20 U.S.C.
12 1059e);

13 “(iii) a part B institution, as defined
14 in section 322 of the Higher Education
15 Act of 1965 (20 U.S.C. 1061);

16 “(iv) a Tribal College or University,
17 as defined in section 316 of the Higher
18 Education Act of 1965 (20 U.S.C. 1059e);

19 “(v) a Native American-serving, non-
20 tribal institution, as defined in section 319

1 of the Higher Education Act of 1965 (20
2 U.S.C. 1059f);

3 “(vi) an Asian American and Native
4 American Pacific Islander-serving institu-
5 tion, as defined in section 320 of the High-
6 er Education Act of 1965 (20 U.S.C.
7 1059g);

8 “(vii) an Alaska Native-serving insti-
9 tution, as defined in section 317 of the
10 Higher Education Act of 1965 (20 U.S.C.
11 1059d);

12 “(viii) a Native Hawaiian-serving in-
13 stitution, as defined in section 317 of the
14 Higher Education Act of 1965 (20 U.S.C.
15 1059d); or

16 “(ix) a Hispanic-serving institution,
17 as defined in section 502 of the Higher
18 Education Act of 1965 (20 U.S.C.
19 1101a).”



XXIV. PROCEEDINGS OF THE FULL COMMITTEE MARKUP ON H.R. 5116, THE AMERICA COMPETES REAUTHORIZATION ACT OF 2010

WEDNESDAY, APRIL 28, 2010

HOUSE OF REPRESENTATIVES,
COMMITTEE ON SCIENCE,
Washington, DC.

The Committee met, pursuant to call, at 10:10 a.m., in Room 2318 of the Rayburn House Office Building, Hon. Bart Gordon [Chairman of the Committee] presiding.

Chairman GORDON. Good morning. The Committee will come to order.

Pursuant to notice, the Committee on Science and Technology meets to consider the following measure: H.R. 5116, the *America COMPETES Reauthorization Act of 2010*. We will now proceed with the markup.

On October 12, 2005, in response to a bipartisan request by this committee and our colleagues in the Senate, the National Academies announced the report *Rising Above the Gathering Storm*. The distinguished panel led by Norm Augustine painted a very scary picture and told us that without action, the future was bleak for our children and our grandchildren. This report was without question a call to arms.

So this committee moved forward by turning the *Gathering Storm* recommendations into legislative language. The final result was enactment of the *America COMPETES Act of 2007* with the bipartisan support of 367 Members. Moreover, with the leadership of Senators Alexander and Bingaman, and 69 cosponsors, the Senate approved the Conference Report by unanimous consent, and I told Senator Alexander the other day that if he does this once again by unanimous consent in the Senate, that I am nominating him for the Nobel Peace Prize as well as special envoy to the Middle East.

Now, after three years, we are back to work on the reauthorization of COMPETES. Since the enactment of COMPETES, the Committee has held 48 hearings on areas addressed in the bill before us today.

The subcommittees, through a bipartisan process, have brought to the Full Committee a strong body of work, and I would like to thank our subcommittee chairs and ranking members for their stewardship of the matters in each of their jurisdictions. I also would like to especially thank the majority and minority staffs for the many, many hours of thoughtful work that they have committed, and all the good advice we have received from Members on and off the Committee, as well as other interested outside parties.

Honestly, this bill is a big deal and it is important. It is a big deal and important for our country and for the Committee's stature in Congress. It is a big deal and an important step in leading our

innovation agenda. It is a big deal and important for the business community, including the U.S. Chamber of Commerce, the National Association of Manufacturers and the Business Roundtable, which is why they have been so supportive. It is a big deal and important for our universities and our national labs. And it is a big deal and important for our children and grandchildren, so they are not the first generation of Americans to inherit a standard of living lower than their parents.

Statistics speak for themselves. More than 50 percent of our economic growth since World War II can be directly attributed to investments in research. The path is simple. Research leads to innovation. Innovation leads to economic development and good-paying jobs.

And even before the price of oil hit record highs, *Gathering Storm* recommended greater energy independence. But we must move to a cleaner, more efficient and more balanced energy portfolio. We should not trade our dependency on foreign oil for a dependency on foreign technology, and that is why ARPA-E [Advanced Research Projects Agency-Energy] is important.

Now, throughout this process, there has been a lot of legitimate discussions about federal deficits, and I agree that we must address the challenges presented by our deficits, but we must also invest in our country's future. I remember Newt Gingrich saying that one of his greatest regrets was not doubling the funding for the National Science Foundation when he put NIH [National Institutes of Health] on a path to doubling.

In the manager's amendment I will offer today, we will maintain a doubling path for our research accounts over the next 10 years, but on a slightly less steep trajectory. As a matter of fact, we will be cutting 10 percent off the original request. So, now, if I were responsible for writing this bill myself, it would look somewhat different than the bill we are going to consider today, but that is a good thing. There have been sincere efforts to be inclusive, to work with Members on both sides of the aisle and develop a bill that is truly a Committee work product. I believe this is a good bill both on substance and on process, and it is a better bill because of the contributions of all of our Members.

Ms. Johnson, Ms. Edwards, Ms. Fudge and Mr. Luján have improved the bill through efforts on diversity and broadening participation. Dr. Ehlers has helped perfect the definitions for the Office of Science. Mr. Smith has helped ensure that standards developed through NIST [National Institute of Standards and Technology] remain voluntary for businesses and industry. Mr. Garamendi has helped ensure that the findings of the fusion energy report make their way into the Department of Energy's planning. These are just a few examples of amendments that have improved our product, without mentioning the hours and hours of staff discussion and the countless changes made during the past month and a half.

COMPETES is truly and will continue to be a bipartisan, bicameral effort that everyone on this committee can feel ownership of and should take bragging rights on.

And finally, let me say that more than 50 years ago, when DARPA [Defense Advanced Research Projects Agency] was first created, they had no idea that the research they would fund would

be responsible for creation of the Internet or proliferation of GPS technology. But it did. And those inventions started with federal dollars, as well as countless other game-changing technologies.

And I really believe in the next 30 years, when most of us are gone from Congress and when this committee is working on the fifth or sixth reauthorization of the *America COMPETES Act*, I am confident that my good friend Mr. Hall will regale us or regale everyone that is left with stories about our efforts today and how we got our innovative spirit back on track and the breakthroughs that ensued.

[The prepared statement of Chairman Gordon follows:]

PREPARED STATEMENT OF CHAIRMAN BART GORDON

On October 12, 2005, in response to a bipartisan request by this committee and our colleagues in the Senate, the National Academies announced the report *Rising Above the Gathering Storm*. The distinguished panel led by Norm Augustine painted a very scary picture and told us that without action, the future was bleak for our children and grandchildren. This report was without question a call to arms.

So, this committee moved forward by turning the *Gathering Storm recommendations* into legislative language. The final result was enactment of the America COMPETES Act of 2007 with the bipartisan support of 367 members. Moreover, with the leadership of Senators Alexander and, Bingaman, and 69 Senate cosponsors, the Senate approved the Conference Report by unanimous consent.

Now after 3 years we are back to work on reauthorizing COMPETES. Since enactment of COMPETES, the committee has held 48 hearings on areas addressed in the bill before us today.

The subcommittees, through a bipartisan process, have brought to the full committees strong body of work and I would like to thank our Subcommittee Chairs and Ranking Members for their stewardship of the matters in each of their jurisdictions. I also would like to especially thank the majority and minority staffs for the many hours of thoughtful work that they have committed. And all the good advice we have received from Members on and off the committee, as well as other interested outside parties.

Honestly, this bill is a big deal and is important. It's a big deal and important for our country and for this committee's stature in the Congress.

It's a big deal and an important step in leading our Innovation agenda. It's a big deal and important for the business community including the U.S. Chamber of Commerce, the National Association of Manufacturers, and the Business Roundtable which is why they have been so supportive. It's a big deal and important for our universities and our national labs. And, it's a big deal and important for our children and grandchildren so they are not the first generation of Americans to inherit a standard of living lower than their parents.

If we are to reverse the trend of the last twenty years, where our country's technology edge in the world has diminished, we must make the investments necessary today.

The statistics speak for themselves. More than 50% of our economic growth since World War II can be directly attributed to investments in research.

The path is simple. Research leads to innovation. Innovation leads to economic development and good paying jobs.

Even before the price of oil hit record highs, *Gathering Storm* recommended greater energy independence. But as we move to a cleaner, more efficient and more balanced energy portfolio, we should not trade our dependence on foreign oil for a dependence on foreign technology. That why is ARPA-E is so important.

Through this process, there has been a lot of legitimate discussion about federal deficits. I agree that we must address the challenges presented by our deficits, but we must also invest in our country's future. I remember Newt Gingrich saying one of his greatest regrets was not doubling the funding for the NSF when he put NIH on the doubling path.

In the manager's amendment I will offer today, we will maintain a doubling path for our research accounts over the next 10 years, but on a slightly less steep trajectory. Though some of my colleagues may believe this cut is not-enough, I would offer to them that Newt Gingrich's doubling path of NIH took piece over 6 years, and in fact nearly tripled over twelve.

Chairman GORDON. Now I recognize Mr. Hall to present his opening remarks.

Mr. HALL. Mr. Chairman, I think I thank you for a Full Committee markup of America COMPETES, and of course, our Nation's ability to compete in a global marketplace depends on many, many factors. Witnesses who have appeared before our Committee this past year and other years have stressed the need for lower taxes, streamlined federal regulations, a reduced national debt and greater market choice to remain competitive. Investments in basic science research and development also spur long-term growth and are of particular interest to our Committee, and I know they are of particular interest to this Chairman. It is not surprising that the National Academies report, *Rising Above the Gathering Storm*, and President Bush's American Competitiveness Initiative focused on these types of scientific investments.

In 2007, our Committee also responded by passing the America COMPETES bill, which was a three-year authorization that placed three agencies, National Science Foundation, the National Institute of Standards of Technology and the Office of Science at the Department of Energy, on a 10-year doubling path. The bill before us today reauthorizes these agencies for five years at a cost of over \$93 billion. It establishes seven new programs and initiatives including energy innovation hubs at DOE [Department of Energy], a loan guarantee program at the Department of Commerce, regional innovation clusters at the Department of Commerce, and a new user facility at NIST.

The concern that I have is that some of these new programs are potentially duplicative of current efforts and divert funding away from basic science research and development. They also increase the cost of the bill by billions. I remain committed to investing in basic science research and development but I am also mindful of our current dire economic situation. The percentage of our Nation's debt is now greater than the percentage of our gross domestic product and our Nation's budget deficit has increased 50 percent since the last authorization of this bill three years ago. These numbers are truly unsustainable and threaten America's ability to compete globally. As stewards of the taxpayers' dollars during these times, we need to be even more vigilant with how we allocate our resources.

During the subcommittee markups, Republican Members offered good amendments to, among other things, shorten the length of authorization from five years to three years to ensure proper oversight, strike new and potentially duplicative programs and clarify the mission and direction of programs. While these did not pass at the subcommittee level, several Members today will be offering similar amendments in addition to others in an attempt to continue the goals outlined in *Rising Above the Gathering Storm* while protecting taxpayers against potential waste and ballooning deficits. I am hopeful that they will get a favorable reception today.

I would like to thank the Chairman and his staff for working with me and working with the Republican staff throughout the process. As I have said before and as I believe today, I have enjoyed working with you over the years and will really and truly

miss your presence in Congress, your leadership and your friendship after your retirement this next year. I yield back my time.

[The prepared statement of Mr. Hall follows:]

PREPARED STATEMENT OF REPRESENTATIVES RALPH M. HALL

Thank you, Mr. Chairman, for holding this full committee markup of America COMPETES. Our nation's ability to compete in the global marketplace depends on many factors. Witnesses who have appeared before our committee this year have stressed the need for lower taxes, streamlined Federal regulations; a reduced national debt, and greater market choice-to remain competitive. Investments in basic science research and development also spur long-term growth and are of particular interest to our Committee. It is not surprising then that the National Academies report, *Rising Above the Gathering Storm*, and President Bush's American Competitiveness Initiative focused on these types of scientific investments.

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I remain committed to investing in basic science research and development, but I am also mindful of our current dire economic situation. The percentage of our nation's debt is now greater than the percentage of our gross domestic product (GDP) and our nation's budget deficit has increased 50% since the last authorization of this bill three years ago. These numbers are truly unsustainable and threaten America's ability to compete globally.

As stewards of the taxpayers' dollars during these times, we need to be even more vigilant with how we allocate our resources. During the subcommittee markups, Republican Members offered good amendments to, among other things, shorten the length of authorization from 5 years to 3 years to ensure proper oversight, strike new and potentially duplicative programs, and clarify the mission and direction of programs. While these did not pass at the subcommittee level, several Members today will be offering similar amendments, in addition to others, in an attempt to continue the goals outlined in *Rising Above the Gathering Storm* while protecting taxpayers against potential waste and ballooning deficits. I am hopeful that they will get a favorable reception today.

I would like to thank the Chairman and his staff for working with me and the Republican staff throughout this process. As I have said before, I have enjoyed working with you over the years and will truly miss your presence in Congress after your retirement this year.

Chairman GORDON. Thank you, Mr. Hall.

Does anyone else wish to be recognized? Mr. Baird is recognized.

Mr. BAIRD. Mr. Chairman, solely for the purpose of lamenting your absence at the Capitol Challenge this morning. As many of my colleagues know, Chairman Gordon set an impressive record of 20 consecutive wins in 20 years, unparalleled and sure to be unrepeated, and we missed you this morning but I am proud to say Dan Lipinski from this committee finished second behind a gentleman about half his age. So, Mr. Chairman, America competes and so does the Chairman of this committee, and we are very proud of you.

Chairman GORDON. Thank you, Mr. Baird. You can see the importance I put on this legislation to be here today and break a 20-year streak.

Does anyone wish to be recognized? If not, we will move forward. I ask unanimous consent that the bill is considered as read and

open to amendment at any point, and that the amendment in the nature of an substitute which was noticed along with the bill be treated as original text for the purpose of amendment, and the reading of the amendment in the nature of a substitute be dispensed with and that the Members proceed with the amendments in the order of the roster. Without objection, so ordered.

Mr. HALL. Mr. Chairman, reserving the right to object, and I probably will not object if this conversation goes well. I would like to ask the Chairman to confirm for me today's Full Committee markup process of H.R. 5116, Mr. Chairman, you are requesting unanimous consent to waive the reading of the amendment in the nature of a substitute?

Chairman GORDON. That is correct.

Mr. HALL. I thank you, Mr. Chairman. Further, we are also to consider a manager's amendment today which will be first on the roster?

Chairman GORDON. That is correct.

Mr. HALL. The official markup notice requested members draft their amendments to the amendment in the nature of a substitute. However, by circulating a manager's amendment last evening, some Members were forced to redraft their amendments. This is the second time in a week for this type of situation. However, the Chairman acknowledged this additional step in the process, which we greatly appreciate. I thank you, and we worked hard to meet the amendment deadline.

Mr. Chairman, will these amendments drafted, the manager's amendment, go first on the roster?

Chairman GORDON. Yes, sir.

Mr. HALL. Is it the Chairman's intention that Members be able to offer amendments not included on the roster including those to the manager's amendment and the amendment in the nature of a substitute?

Chairman GORDON. If additional amendments are offered, yes, sir.

Mr. HALL. In the case of a Member not being present to offer his or her amendment listed on the roster, is it the Chairman's intention that the amendment may be offered by another member or may be offered by the Member when the Member returns at the end of the roster?

Chairman GORDON. That is correct.

Mr. HALL. I thank the Chairman for reviewing the process for today, and I withdraw my reservation.

Chairman GORDON. Thank you, Mr. Hall.

Let me just say, so everyone knows our process today, we have a lot of amendments, almost—we are going to be approaching 60, but they are all reasonable amendments and they deserve to have consideration. I am expecting that we are going to have votes around noon, and so I doubt that we will be through by noon so at that time we will notice when we will get started again. It will be shortly thereafter. We have pizza that will be available on a bipartisan basis. Well, maybe. We will see how Dr. Broun is acting. He may have to get a permit. But it will be in the Chairman's office. We will have pizza. There will probably be additional votes, a series maybe around 1:30 or 2:00, and then we will be in session

until 7:00. My hope is that we will be through long before 7:00, but if not, we will proceed until we complete the bill and everybody has a chance to say what they want to say.

Mr. ROHRABACHER. Mr. Chairman, will the minority have a right to have a part in the decision of what goes on those pizzas, what the toppings will be?

Chairman GORDON. You will have a third of the pizza.

Mr. BROUN. Mr. Chairman.

Chairman GORDON. Dr. Broun.

Mr. BROUN. I ask unanimous consent that I may have a permit for the pizza.

Chairman GORDON. Without objection.

Mr. BROUN. Thank you, Mr. Chairman.

Chairman GORDON. We are going to have a quick gavel on that one.

So without further objection, or without objection, so ordered. The first amendment on the roster is a manager's amendment offered by the Chair. The clerk will report the amendment.

The CLERK. Amendment number 041, amendment to the amendment in the nature of a substitute offered by Mr. Gordon of Tennessee.

Chairman GORDON. I ask unanimous consent to dispense with the reading. Without objection, so ordered. I recognize myself for five minutes to explain the amendment.

The manager's amendment I offer makes several technical and minor changes to the base text. The most significant part of the amendment is changes to many of the bill's authorization levels. During the subcommittee process, several amendments were offered to reduce the authorization level in the bill. At the first markup in the Energy and Environment Subcommittee, Mrs. Biggert had an amendment that she withdrew on my commitment to address the authorization levels at Full Committee. I appreciate the patience of the members and willingness to work with us to address this in a holistic way.

Overall, the funding changes in the amendment will reduce authorization levels in this bill by just over 10 percent. We maintain a 10-year doubling path by growing the authorization for each agency at approximately seven percent annually. The funding path provides a modest cushion above the President's request in the event that our deficits come down and more funds are available. And at the same time, we provide a stable, sustainable and achievable set of authorization levels across the agencies. These levels are lower than I would like them to be, but I believe they are practical considering our current budget deficits. At a time of flat discretionary budgets, a seven percent growth rate for continued progress in getting our research programs back on a path to be the best in the world I think is a good investment in our children's future.

Is there further discussion on the amendment? Mr. Hall is recognized.

Mr. HALL. Thank you, Mr. Chairman. By reducing the authorization funding level, the manager's amendment moves the bill I think in the right direction. It also addresses some of the Members' concerns. I appreciate the gentleman's continued willingness to work with our side to improve this bill.

Unfortunately, I am a little disappointed to see that you have removed the language that we both worked so diligently on to have placed in the 2007 version of COMPETES regarding the Noyce Scholarship Program. It was taken out in conference. I appreciate your including it in the underlying measure before us today.

I know you and I both agree that we want to see all of our students reap the benefits of having the best math and science teachers we can possibly get. We recognize the unique challenges of “high-need schools” and the underlying bill, by providing an additional incentive for these new trained teachers to be there, but we also allowed flexibility for them to teach in any school. I am just wondering why that provision is being removed in this amendment. Regardless, it is my hope that we can further improve the bill moving forward today. Even after factoring in the lower authorization number in the manager’s amendment, the bill still calls for billions in new spending.

I thank the Chairman. I yield back my time.

Chairman GORDON. Does any else wish to be recognized? Mrs. Biggert is recognized.

Mrs. BIGGERT. I move to strike the last word.

Mr. Chairman, I thank you for working on the authorization. I will just take a minute to say thank you. I think in these economic times, it is very important that we try and get by on the amount that is needed, but I do think, as we have talked about physical science, that this is a very important bill and thank you for all the work you have done on it, and I think that the authorization really helps to be fiscally responsible, and I appreciate you working with me and I yield back.

Chairman GORDON. I will say to the gentlelady, again, in a perfect world, you and I would like to see even more investment in these areas and think it is a good investment. We try to be sensitive to the fact that, again, these are difficult times and we wanted to try to make—again, a 10 percent reduction I think is a pretty significant reduction over the original proposal.

Let me also say that you will find at your desk a list of endorsements. These are just a few of the first endorsements that are coming in. There are literally going to be hundreds of endorsements before this bill is over with: the National Chamber of Commerce, National Association of Manufacturers, the Business Roundtable, the entire university and research community. So again, I think they recognize the benefit of this and I think some of them also had the same concerns you did and that is why we tried to address them, and I thank you for that.

Okay. The next amendment on the roster is an amendment offered by the gentleman from Georgia, Dr. Broun. Are you ready to proceed with your amendment?

Mr. BROUN. Yes, Mr. Chairman. I have an amendment at the desk.

Chairman GORDON. The clerk will report the amendment.

The CLERK. Amendment number 172, amendment offered by Mr. Broun of Georgia to the amendment offered by Mr. Gordon of Tennessee.

Chairman GORDON. I ask unanimous consent to dispense with the reading. Without objection, so ordered.

I now recognize the gentleman for five minutes.

Mr. BROUN. Thank you, Mr. Chairman. I have this amendment that I was very pleased to hear the Chairman say he is concerned about our children's future, and this is just a commonsense amendment that will help ensure our children's economic future, I believe.

This amendment would help our Committee conduct more effective oversight and financial stewardship over the entire COMPETES program. It simply keeps intact the first three years of authorized spending at fiscal year 2010 appropriations level through fiscal year 2013 for NSF [National Science Foundation], NIST, the Office of Science and ARPA-E sections in the manager's amendment but it strikes out the two-year funding levels for fiscal year 2014 and 2015. It will reduce the authorized spending by over \$45 billion. Eight point two billion will be reduced in the first three years by extending the fiscal year 2010 base levels and \$37 billion will be saved by striking out the last two years. The three-year authorization level is consistent with the original 2007 COMPETES authorization, and with that authorization, we found plenty to change.

According to CBO [Congressional Budget Office], the President's budget raises the deficit to \$1.5 trillion in 2010, and our debt held by the public is ever growing as well as is unsustainable. Additionally, this reauthorization goes beyond the President's request. At an economic time such as now, why do we need to extend the COMPETES authorization to five years? The fiscally responsible course to follow for our Committee is to keep these sections in the reauthorization at the 2010 appropriated level and at a three-year authorization timeline. At the end of three years, or beforehand, our Committee can always come back to the drawing board and assess how these agencies are living up to their commitments.

I urge the Committee to support this amendment by keeping the authorized funding at the 2010 appropriated levels for those sections that we have listed in this amendment and by reducing the authorization timeline to three years so that we can have the opportunity to better review the entire COMPETES program at that time.

Mr. Chairman, I have a reference chart that I would ask unanimous consent to be entered into the record at this point.

Chairman GORDON. The gentleman concludes?

Mr. BROUN. I just asked unanimous—yes, I yield back for a unanimous consent request to put the reference charts into the record at this point.

[The information follows:]

2010 America COMPETES (ANS)				
	Three year auth. totals (FY11-13)	Baseline (FY10 enacted*3)	Total new spending authorized	
DOE	18,746	14,712	4,034	
NIST	3,063	2,568	495	
NSF	24,372	20,617	3,755	
TOTAL	46,181	37,897	8,284	

Chairman GORDON. Certainly. Without objection.

Mr. BROUN. Mr. Chairman, we do need to have innovation. We do need to have a reauthorization, but our children's future really is dependent upon not only research and development from the science and technology perspective but also in the area of fiscal responsibility. This committee has an opportunity with this amendment to show fiscal responsibility to the American public, and it is absolutely time that we do that. It is past time that we do that. And I just hope that the Chairman and my Democratic colleagues will support this amendment. It is a common sense amendment. It doesn't stop the research and development. It is a fiscally conservative, common sense amendment, and the simple truth is, we drastically need it for our children and grandchildren's future.

With that, Mr. Chairman, I yield back and I thank the Chairman.

Chairman GORDON. Thank you, Dr. Broun, and the Chairman yields to himself.

Certainly, I think we all agree at this podium that we need to be fiscally responsible, but we also have to invest in our future in those areas that need to be. As was mentioned earlier, we make a 10 percent reduction in the original authorization level. I think that shows good faith in moving that direction. But changing an authorization from five years to three years really doesn't save money. You have got the same amount being spent in those first three years. So I think we really need the five years to have consistency with research. The original COMPETES was authorized for three years, and the reason for that is, it was a new bill, and so we felt it needed a shorter period of time. But I think now we need to get into the continuity. I think that this committee I am sure will continue with oversight over these next one, two, three, four and five years, if there need to be changes that can be made at that time. But I think it would be a false savings to just move a five-year bill to a three-year bill.

Now I recognize—

Mr. BROUN. Mr. Chairman.

Chairman GORDON. I yield my time to Dr. Broun.

Mr. BROUN. Thank you, Mr. Chairman.

By cutting it to three years, it doesn't stop this committee from coming back to the drawing board. Also, this amendment does reduce the spending because it reduces it down to fiscal year 2010 levels so it does actually save money and does help preserve our children and grandchildren's future. So I agree with the Chairman, we do need to have innovation, we do need to have the research and development. This amendment will not stop those from going forward, and as a scientist I believe very firmly in research and development and believe in these programs, but it will cut spending if this amendment is adopted. It will help preserve our children and grandchildren's future and it doesn't stop this committee from coming back.

But most importantly, I think this helps us with oversight, and it will give us ability to have more oversight on this so that we have these entities in the Federal Government come back to this committee and help us to have a greater watchful eye over what is going on there. And so it is for the oversight as well as for the reduced spending that I offer this amendment.

I thank the Chairman for yielding.

Chairman GORDON. Is there further discussion on the amendment?

Mr. HALL. Mr. Chairman.

Chairman GORDON. Mr. Hall is recognized.

Mr. HALL. Mr. Chairman, I want to thank Dr. Broun, I thank you too, and I thank Dr. Broun for offering this amendment and point out how dramatically our fiscal situation has changed since we originally passed this bill. In 2007, when the Committee first passed COMPETES, the federal budget deficit was projected at \$160 billion and the national debt was \$8 trillion. This year, the deficit is projected to be almost \$1.6 trillion, 10 times higher, and the national debt is over \$12 trillion, a 50 percent increase in less than three years. We simply can't continue to spend as if we aren't in a budget crisis.

This amendment recognizes that, and I thank Dr. Broun for offering it. I yield back my time.

Chairman GORDON. Dr. Baird is recognized.

Mr. BAIRD. Mr. Chairman, I will just make two points. First of all, at the end of the Clinton Administration, there was a \$200 billion plus surplus in the federal budget. By the end of the Bush Administration, there was a \$1.3 trillion deficit. The national debt had doubled. Our dependency on foreign borrowing had doubled, and that includes countries like China that are not our best friends. Many of my colleagues on the other side voted repeatedly for budgets that did not fully fund the war, voted for tax cuts that were not paid for and so I applaud them for at long last caring about the deficit.

The problem here, however, is that this resolution actually undermines science and doesn't, in fact, save any money. It won't save money and it is not fiscally responsible for two reasons. First of all, we are going to continue the National Science Foundation funding unless the gentleman is proposing we actually terminate it. There is nothing in this amendment, there is nothing that can prevent any future Congress from looking at with full oversight the NSF

as they ought to do all the others, NIST, NSF, ARPA-E. We ought to do that an annual basis and in fact we do as responsible chairs. So this is largely a specious amendment, I am sorry to say, and it won't save any money but it will undermine science if it were to pass. And the reason for that is, scientific research, as a scientist who has actually published in international scientific journals myself, scientific research sometimes takes several years to complete and it takes several years to plan, and if you have uncertainty about whether the funding will be there, you can't pursue those avenues of research. So in fact what would happen if we did this was we would actually weaken the scientific endeavor, reduce America's competitiveness, which is the antithesis of the intent of this bill, and undermine the fundamental premise of the blue ribbon panel that wrote *Rising Above the Gathering Storm*.

So I don't plan to make those points too many more times, because I think they ought to serve as a basis for future discussion when these deficit arguments arise and amendments to purport to reduce the deficit are offered that, in fact, would not reduce the deficit one iota, but would in fact undermine our scientific mission. I yield back.

Mr. BROUN. Would the gentleman yield?

Mr. BAIRD. I am sorry, Mr. Broun. I already yielded back.

Chairman GORDON. Who was it that asked for time? Dr. Broun, you can have your own time.

Mr. BROUN. Thank you, Mr. Chairman.

Dr. Baird, I have been a great critic of our President and our Congress creating the large debt that has been created, and as the gentleman from Washington knows, I wasn't here to vote on all those bills and I think it was wrong, but it does not matter what happened in the past. We must deal with the future. And the deficit is at \$1.6 trillion currently, and if we had an unlimited amount of funds, there are a lot of great things that could be done but as families look to balance their budget, as small businesses and large businesses look at trying to have a balanced budget within their businesses, as my own State of Georgia has to balance its budget, it is critical that the Federal Government balance its budget, and we are just not doing that, and continuing the spending at the level that we are growing this Federal Government is just unsustainable and it is just—actually, as far as I am concerned, it is criminal because we are stealing our children and grandchildren's future and we have just got to stop the spending.

So there are many great things that can be done, many great things that I would like to see done, but continuing to spend money that we don't have, borrowing money from China—we just recently had a bond auction where there weren't enough people there to bid on our bonds, and we are getting at the point where we are going to have a financial collapse of this country if we don't stop the spending.

I am not in favor of cutting these programs. I am just saying that we need to hold the line for a while, get us out of this economic downturn and then we can go forward. It is time for us to put the constraints on the spending of Congress. It is past time. And I don't care whether it is Republicans or Democrats running this

Congress. We have got to stop the spending. It is just stealing our children and our grandchildren's future.

And I appreciate the gentleman's concern and I appreciate his scientific inquiry and his publishing but if we just hold the line for a while and get this economy going again, by stimulating the private sector instead of stimulating government, then we can have more money to spend on further research and development. It is time to just kind of rein things in for a bit so that we can go forward. I thank the gentleman for yielding.

Chairman GORDON. Thank you, Dr. Broun. We will have an opportunity to discuss this three or four more times on these next amendments.

Mr. BARTLETT. Mr. Chairman.

Chairman GORDON. Dr. Bartlett.

Mr. BARTLETT. Thank you. I am somewhat conflicted. I am one of only 18 in this House that voted against all of the bailout stimulus programs and so I don't need to defend my conservative credentials, but I will tell you that—and I have more children and grandchildren than anyone else here, I think, 17 grandchildren and two great-grandchildren, and I am really concerned about their future. And one of my concerns is that we are losing the technology battle to other countries. This year China will graduate seven times as many engineers as we graduate. And so I think one of the best things that I can do for my kids and my grandkids and my great-grandkids is to make sure that we have the technology base. By the way, if we had been doing this 20 years ago, we wouldn't have the fiscal problems we have today because we would be competing better.

Very sadly, just a couple of weeks ago, the last 330 manufacturers of what used to be one of the largest solar cell manufacturing companies in the world, Solarex, now BP Solar, was shut down in my district. So I think that our kids' future is going to be better if we invest in these technologies because we are going to then be able to compete internationally. If we don't, I have some serious concerns about our future.

I don't need to defend my conservative credentials. You know, I think that as a true conservative, you really need to be looking for what will be best for your kids in the future, and I think expanding our technology base is what we ought to be doing.

Mrs. BIGGERT. Will the gentleman yield?

Mr. BARTLETT. I would be happy to yield.

Mrs. BIGGERT. Thank you.

I would like to attach my remarks to those of Dr. Baird and Dr. Bartlett. For those with Dr. Baird, it would be in remarks after the political commercial.

I would agree that this is something that we have to do, and so many times on this committee that we have always been behind other committees as far as, you know, what we need to do. Research and development is the most important thing that we can do for the innovation and creativity and I think that we have to—we really have to move ahead and do this. If we want to improve the economy, if we want to have the jobs, this is the way to do it, and I know the economic times but I think I would agree that I would be opposed to this amendment. Yield back.

Chairman GORDON. That sounds like a statement from a good Stanford graduate.

Is there—Mr. Diaz-Balart, do you—

Mrs. BIGGERT. I did notice that Stanford was on the list.

Mr. DIAZ-BALART. Chairman, I promise to be brief. I just want to support Mr. Broun's amendment.

Look, you know, if we don't control our spending appetite, we are not going to have to worry about our technology advantage or our economic advantage or our military advantage. We are going to have to worry about it as much as Argentina is worrying about it or Greece is worrying about it right now. We are at a crossroads, ladies and gentlemen, where we are bankrupting the country, and we are going to have to do our part. That is the decision we have to make and we can always spend good money after good money or good money after bad money but we need to start doing our part. I am not blaming anybody, but we need to start controlling our appetite for this spending.

Thank you, Mr. Chairman.

Chairman GORDON. If there is no further discussion on the amendment, then the vote occurs on the amendment. All in favor, say aye. Opposed, no. The no's have it and the—

Mr. BROUN. Mr. Chairman.

Chairman GORDON. —amendment is not agreed to—

Mr. BROUN. Mr. Chairman.

Chairman GORDON. —and the clerk will call the roll.

The CLERK. Chairman Gordon?

Chairman GORDON. No.

The CLERK. Chairman Gordon votes no. Mr. Costello?

[No response.]

The CLERK. Ms. Johnson?

Ms. JOHNSON. No.

The CLERK. Ms. Johnson votes no. Ms. Woolsey?

[No response.]

The CLERK. Mr. Wu?

Mr. WU. No.

The CLERK. Mr. Wu votes no. Mr. Baird?

Mr. BAIRD. No.

The CLERK. Mr. Baird votes no. Mr. Miller?

[No response.]

The CLERK. Mr. Lipinski?

Mr. LIPINSKI. No.

The CLERK. Mr. Lipinski votes no. Ms. Giffords?

[No response.]

The CLERK. Ms. Edwards?

Ms. EDWARDS. No.

The CLERK. Ms. Edwards votes no. Ms. Fudge?

[No response.]

The CLERK. Mr. Luján?

Mr. LUJÁN. No.

The CLERK. Mr. Luján votes no. Mr. Tonko?

Mr. TONKO. No.

The CLERK. Mr. Tonko votes no. Mr. Garamendi?

Mr. GARAMENDI. No.

The CLERK. Mr. Garamendi votes no. Mr. Rothman?

Mr. ROTHMAN. No.
The CLERK. Mr. Rothman votes no. Mr. Matheson?
[No response.]
The CLERK. Mr. Davis?
Mr. DAVIS. No.
The CLERK. Mr. Davis votes no. Mr. Chandler?
[No response.]
The CLERK. Mr. Carnahan?
Mr. CARNAHAN. No.
The CLERK. Mr. Carnahan votes no. Mr. Hill?
Mr. HILL. No.
The CLERK. Mr. Hill votes no. Mr. Mitchell?
Mr. MITCHELL. No.
The CLERK. Mr. Mitchell votes no. Mr. Wilson?
Mr. WILSON. No.
The CLERK. Mr. Wilson votes no. Mrs. Dahlkemper?
Mrs. DAHLKEMPER. No.
The CLERK. Mrs. Dahlkemper votes no. Mr. Grayson?
Mr. GRAYSON. No.
The CLERK. Mr. Grayson votes no. Ms. Kosmas?
Ms. KOSMAS. No.
The CLERK. Ms. Kosmas votes no. Mr. Peters?
Mr. PETERS. No.
The CLERK. Mr. Peters votes no. Mr. Hall?
Mr. HALL. Aye.
The CLERK. Mr. Hall votes aye. Mr. Sensenbrenner?
[No response.]
The CLERK. Mr. Lamar Smith?
[No response.]
The CLERK. Mr. Rohrabacher?
Mr. ROHRABACHER. Yes.
The CLERK. Mr. Rohrabacher votes aye. Mr. Bartlett?
Mr. BARTLETT. Present.
The CLERK. Mr. Bartlett votes present. Mr. Ehlers?
Mr. EHLERS. No.
The CLERK. Mr. Ehlers votes no. Mr. Lucas?
[No response.]
The CLERK. Mrs. Biggert?
Mrs. BIGGERT. No.
The CLERK. Mrs. Biggert votes no. Mr. Akin?
Mr. AKIN. Yes.
The CLERK. Mr. Akin votes aye. Mr. Neugebauer?
Mr. NEUGEBAUER. Aye.
The CLERK. Mr. Neugebauer votes aye. Mr. Inglis?
Mr. INGLIS. Aye.
The CLERK. Mr. Inglis votes aye. Mr. McCaul?
Mr. McCAUL. Aye.
The CLERK. Mr. McCaul votes aye. Mr. Diaz-Balart?
Mr. DIAZ-BALART. Aye.
The CLERK. Mr. Diaz-Balart votes aye. Mr. Bilbray?
Mr. BILBRAY. Bilbray votes aye.
The CLERK. Mr. Bilbray votes aye. Mr. Adrian Smith?
Mr. SMITH OF NEBRASKA. Aye.
The CLERK. Mr. Adrian Smith votes aye. Mr. Broun?

Mr. BROUN. Aye.

The CLERK. Mr. Broun votes aye. Mr. Olson?

Mr. OLSON. Aye.

The CLERK. Mr. Olson votes aye.

Chairman GORDON. Has everyone been—Mr. Miller.

Mr. MILLER. Mr. Miller votes no.

The CLERK. Mr. Miller votes no.

Chairman GORDON. Ms. Fudge?

Ms. FUDGE. No.

The CLERK. Ms. Fudge votes no.

Chairman GORDON. If there is no one—Mr. Matheson.

The CLERK. Mr. Matheson votes no.

Chairman GORDON. If there is no one else, then the clerk will report the vote.

The CLERK. Mr. Chairman, 11 Members vote aye, 24 Members vote no and one Member votes present.

COMMITTEE ON SCIENCE AND TECHNOLOGY - 111th

DATE 4-28-10 AMENDMENT NO. 2 ROLL CALL NO. 1_
 Bill: H. R. 5116 – America COMPETES
 Reauthorization Act of 2010
 SPONSOR of AMEND – Mr. Broun 172

PASSED VOICE VOTE
 DEFEATED ✓ WITHDRAWN

Quorum – 15 to vote – 22 to report

	MEMBER	AYE	NO	PRESENT	NOT VOTING
1	Mr. GORDON, Chair		✓		
2	Mr. COSTELLO - IL				
3	Ms. JOHNSON - TX		✓		
4	Ms. WOOLSEY - CA				
5	Mr. WU - OR		✓		
6	Mr. BAIRD - WA		✓		
7	Mr. MILLER - NC		✓		
8	Mr. LIPINSKI - IL		✓		
9	Ms. GIFFORDS - AZ				
10	Ms. EDWARDS - MD		✓		
11	Ms. FUDGE - OH		✓		
12	Mr. LUJÁN - NM		✓		
13	Mr. TONKO - NY		✓		
14	Mr. GARAMENDI, CA		✓		
15	Mr. ROTHMAN - NJ		✓		
16	Mr. MATHESON - UT		✓		
17	Mr. DAVIS - TN		✓		
18	Mr. CHANDLER - KY				
19	Mr. CARNAHAN - MO		✓		
20	Mr. HILL - IN		✓		
21	Mr. MITCHELL - AZ		✓		
22	Mr. WILSON - OH		✓		
23	Mrs. DAHLKEMPER - PA		✓		
24	Mr. GRAYSON - FL		✓		
25	Ms. KOSMAS - FL		✓		
26	Mr. PETERS - MI		✓		
27	Vacancy				
1	Mr. HALL - TX	✓			
2	Mr. SENSENBRENNER - WI				
3	Mr. LAMAR SMITH - TX				
4	Mr. ROHRBACHER - CA	✓			
5	Mr. BARTLETT - MD			✓	
6	Mr. EHLERS - MI		✓		
7	Mr. LUCAS - OK				
8	Mrs. BIGGERT - IL		✓		
9	Mr. AKIN - MO	✓			
10	Mr. NEUGEBAUER - TX	✓			
11	Mr. INGLIS - SC	✓			
12	Mr. McCAUL - TX	✓			
13	Mr. DIAZ-BALART - FL	✓			
14	Mr. BILBRAY - CA	✓			
15	Mr. ADRIAN SMITH - NE	✓			
16	Mr. BROUN - GA	✓			
17	Mr. OLSON - TX	✓			
	TOTALS	11	24	1	

Mr. DIAZ-BALART. Mr. Chairman, I have the next amendment on the roster.

Chairman GORDON. The next amendment on the roster is an amendment by the gentleman from Florida, Mr. Diaz-Balart. Are you ready to proceed with your amendment?

Mr. DIAZ-BALART. Yes, thank you very much, Mr. Chairman.

Chairman GORDON. The clerk will report the amendment.

The CLERK. Amendment number 023, amendment offered by Mr. Mario Diaz-Balart of Florida to the amendment offered by Mr. Gordon of Tennessee.

Chairman GORDON. I ask unanimous consent to dispense with the reading. Without objection, so ordered.

I now recognize the gentleman for five minutes to explain his amendment.

Mr. DIAZ-BALART. Thank you very much, Mr. Chairman. I will try to be a little bit more brief if possible.

Passing the manager's amendment before us would authorize over \$83.9 billion over five and ten years, and also there are parts in bill that say "in addition to such sums." There is a lot of provisions regarding "such sums." I think it is important to go over some of the spending details, and again, I must say that I do want to thank the Chairman for his willingness to work with us and listen to us but I do think it is important to kind of find out where we are.

In the first year of funding of the bill, it recommends an increase of \$345 million above the Administration's request. Remember that the President's budget last year was \$3.6 trillion with revenues of \$2.4 trillion. Now, I know a lot of people are to blame for sins of the past and that is okay. This year the President's budget recommendation is \$3.8 trillion. Here is the problem. Revenues are \$2.6 trillion. This bill goes above the President's recommended levels. I will put it in perspective. ARPA-E, which was funded for the first time in the stimulus, is really a brand-new program, and the bill more than triples its funding over five years to \$1 billion and it extends it through fiscal year 2020 with "such sums as necessary." Again, all this funding amounts to over \$83.9 billion, which is \$20 billion over in new funding, or 32.9 percent above the current baseline.

So let me tell you what this amendment does. First, this amendment, very similar to what Dr. Broun was trying to do, this amendment would simply strike out the out-year fundings in the bill to make it a three-year bill, which is consistent with America, the original America COMPETES bill, which has received so much praise. This would allow our Committee to conduct more effective oversight of the entire COMPETES program and then coming back in three years to review and consider that. Now, hopefully in three years maybe the deficit has been reduced and maybe our fiscal situation is in better shape. We can see then if we need to cut money or to even increase funding for the COMPETES program, and we can also find out what works. All it does is, it forces us to look at the issue in three years. But most importantly, the amendment would reduce the authorized spending in this bill by \$37 billion by striking the out-year funding.

The second part of the amendment still places the three priority agencies, the Office of Science, NIST and the National Science Foundation, on a doubling path over 10 years using the fiscal year 2010 appropriated levels. It doubles the appropriated levels as opposed to what the bill does. This would reduce authorized funding by \$1.2 billion in 2011 through 2013. The amendment prioritizes core research at the three main agencies and it gives them really huge increases, I will tell you, which has obviously been a recommendation of the science and business communities. And again, we are able to then prioritize.

In conclusion, this amendment would reduce the total authorization by \$38.22 billion, and as Mr. Broun was saying, you know, we can point toward the past, and Mr. Baird is a dear friend of mine, and I have had these discussions in the Budget Committee many times over and we can complain about the doubling of the debt and the deficit during the last Administration. That is a worthwhile complaint, and I agree with them there. But then should we triple the thing that we criticized and say it is okay? Well, here we have an opportunity to just do a small part, our part to just say we are still going to double the funding but let us just to make it a little bit less painful, a little bit less money on our children and our grandchildren's credit card. That is all this does.

I thank the Chairman for his willingness to always listen to me and he has been extremely cooperative, but I think this is a step in the right direction. It doesn't hurt the program. It still increases funding dramatically but it does at least show that we are willing to at least recognize that we have a serious problem and that we do not want to be the next Greece or the next Argentina, and the American people know that we are at a crossroads right now whether we are going to leave our country, whether our children are going to continue to live in the freest, most prosperous country or whether we are going to change that.

This is a small step in the right direction. I urge your support of the amendment. Thank you, Mr. Chairman.

Chairman GORDON. Thank you, and I thank my friend from Florida and recognize myself for five minutes.

Again, I think that this committee made more than just a small recognition or a small acknowledgement by cutting the original recommendation by 10 percent. I think that was a significant cut, a significant recognition of the situation we are in. Obviously the appropriators will make the final decision and they will have the leeway to do that.

So if there is no further discussion—

Mr. HALL. Mr. Chairman.

Chairman GORDON. Mr. Hall is recognized.

Mr. HALL. Mr. Chairman, this amendment is about prioritizing, and we simply don't have enough money to pay for everything we want to do so we have to prioritize. Mr. Diaz-Balart's amendment does exactly that by providing for increases to research at the three priority agencies identified by the Committee in 2007, NSF, DOE Office of Science and NIST, while holding ARPA-E flat. This would trim over \$1 billion from the authorized levels in the first three years of the bill, many more billions by striking the out-year funding. It is a good amendment. I strongly support it.

Mr. BARTLETT. Mr. Chairman.

Chairman GORDON. Dr. Bartlett is recognized.

Mr. BARTLETT. Yes, I am going to use a technique that Rush Limbaugh callers use to try and shorten the debate here. I am going to say "ditto," which incorporates my previous remarks. Thank you very much and I yield back.

Chairman GORDON. And ditto to you.

If there is no further discussion, then the vote occurs on the amendment. All in favor, say aye. Opposed, no. The amendment fails and—the clerk will be glad to call the roll.

The CLERK. Chairman Gordon?

Chairman GORDON. No.

The CLERK. Chairman Gordon votes no. Mr. Costello?

[No response.]

The CLERK. Ms. Johnson?

Ms. JOHNSON. No.

The CLERK. Ms. Johnson votes no. Ms. Woolsey?

[No response.]

The CLERK. Mr. Wu?

Mr. WU. No.

The CLERK. Mr. Wu votes no. Mr. Baird?

Mr. BAIRD. No.

The CLERK. Mr. Baird votes no. Mr. Miller?

Mr. MILLER. No.

The CLERK. Mr. Miller votes no. Mr. Lipinski?

[No response.]

The CLERK. Ms. Giffords?

Ms. GIFFORDS. No.

The CLERK. Ms. Giffords votes no. Ms. Edwards?

Ms. EDWARDS. No.

The CLERK. Ms. Edwards votes no. Ms. Fudge?

Ms. FUDGE. No.

The CLERK. Ms. Fudge votes no. Mr. Luján?

Mr. LUJÁN. No.

The CLERK. Mr. Luján votes no. Mr. Tonko?

Mr. TONKO. No.

The CLERK. Mr. Tonko votes no. Mr. Garamendi?

Mr. GARAMENDI. No.

The CLERK. Mr. Garamendi votes no. Mr. Rothman?

Mr. ROTHMAN. No.

The CLERK. Mr. Rothman votes no. Mr. Matheson?

Mr. MATHESON. No.

The CLERK. Mr. Matheson votes no. Mr. Davis?

Mr. DAVIS. No.

The CLERK. Mr. Davis votes no. Mr. Chandler?

[No response.]

The CLERK. Mr. Carnahan?

[No response.]

The CLERK. Mr. Hill?

Mr. HILL. No.

The CLERK. Mr. Hill votes no. Mr. Mitchell?

Mr. MITCHELL. No.

The CLERK. Mr. Mitchell votes no. Mr. Wilson?

Mr. WILSON. No.

The CLERK. Mr. Wilson votes no. Mr. Dahlkemper?
 Mrs. DAHLKEMPER. No.
 The CLERK. Mrs. Dahlkemper votes no. Mr. Grayson?
 Mr. GRAYSON. No.
 The CLERK. Mr. Grayson votes no. Ms. Kosmas?
 Ms. KOSMAS. No.
 The CLERK. Ms. Kosmas votes no. Mr. Peters?
 Mr. PETERS. No.
 The CLERK. Mr. Peters votes no. Mr. Hall?
 Mr. HALL. Aye.
 The CLERK. Mr. Hall votes aye. Mr. Sensenbrenner?
 [No response.]
 The CLERK. Mr. Lamar Smith?
 [No response.]
 The CLERK. Mr. Rohrabacher?
 Mr. ROHRABACHER. Yes.
 The CLERK. Mr. Rohrabacher votes aye. Mr. Bartlett?
 Mr. BARTLETT. Present.
 The CLERK. Mr. Bartlett votes present. Mr. Ehlers?
 Mr. EHLERS. No.
 The CLERK. Mr. Ehlers votes no. Mr. Lucas?
 [No response.]
 The CLERK. Mrs. Biggert?
 Mrs. BIGGERT. No.
 The CLERK. Mrs. Biggert votes no. Mr. Akin?
 Mr. AKIN. Yes.
 The CLERK. Mr. Akin votes aye. Mr. Neugebauer?
 Mr. NEUGEBAUER. Aye.
 The CLERK. Mr. Neugebauer votes aye. Mr. Inglis?
 Mr. INGLIS. Aye.
 The CLERK. Mr. Inglis votes aye. Mr. McCaul?
 Mr. MCCAUL. Aye.
 The CLERK. Mr. McCaul votes aye. Mr. Diaz-Balart?
 Mr. DIAZ-BALART. Aye.
 The CLERK. Mr. Diaz-Balart votes aye. Mr. Bilbray?
 Mr. BILBRAY. Bilbray votes aye.
 The CLERK. Mr. Bilbray votes aye. Mr. Adrian Smith?
 Mr. SMITH OF NEBRASKA. Aye.
 The CLERK. Mr. Adrian Smith votes aye. Mr. Broun?
 Mr. BROUN. Aye.
 The CLERK. Mr. Broun votes aye. Mr. Olson?
 Mr. OLSON. Aye.
 The CLERK. Mr. Olson votes aye.
 Chairman GORDON. Have all Members been recorded?
 Mr. LIPINSKI. Mr. Chairman.
 Chairman GORDON. Mr. Lipinski?
 The CLERK. Mr. Lipinski is not recorded.
 Mr. LIPINSKI. No.
 The CLERK. Mr. Lipinski votes no.
 Chairman GORDON. And what was Mr. Lipinski's time?
 Mr. LIPINSKI. I am not sure.
 Chairman GORDON. Mr. Carnahan?
 The CLERK. Mr. Carnahan is not recorded.
 Mr. CARNAHAN. No.

The CLERK. Mr. Carnahan votes no.

Chairman GORDON. Does anyone else wish to be recorded? If not, the clerk will report the vote.

The CLERK. Mr. Chairman, I have 11 members voting aye, 25 voting no and one present.

COMMITTEE ON SCIENCE AND TECHNOLOGY - 111th

DATE 4-28-10 AMENDMENT NO. 3 ROLL CALL NO. 2_
 Bill: H. R. 5116 – America COMPETES
 Reauthorization Act of 2010
 SPONSOR of AMEND – Mr. Diaz-Balart 023

PASSED VOICE VOTE
 DEFEATED ✓ WITHDRAWN

Quorum – 15 to vote – 22 to report

	MEMBER	AYE	NO	PRESENT	NOT VOTING
1	Mr. GORDON, Chair		✓		
2	Mr. COSTELLO - IL		✓		
3	Ms. JOHNSON - TX		✓		
4	Ms. WOOLSEY - CA				
5	Mr. WU - OR		✓		
6	Mr. BAIRD - WA		✓		
7	Mr. MILLER - NC		✓		
8	Mr. LIPINSKI - IL		✓		
9	Ms. GIFFORDS - AZ		✓		
10	Ms. EDWARDS - MD		✓		
11	Ms. FUDGE - OH		✓		
12	Mr. LUJÁN - NM		✓		
13	Mr. TONKO - NY		✓		
14	Mr. GARAMENDI, CA		✓		
15	Mr. ROTHMAN - NJ		✓		
16	Mr. MATHESON - UT		✓		
17	Mr. DAVIS - TN		✓		
18	Mr. CHANDLER - KY				
19	Mr. CARNAHAN - MO		✓		
20	Mr. HILL - IN		✓		
21	Mr. MITCHELL - AZ		✓		
22	Mr. WILSON - OH		✓		
23	Mrs. DAHLKEMPER - PA		✓		
24	Mr. GRAYSON - FL		✓		
25	Ms. KOSMAS - FL		✓		
26	Mr. PETERS - MI		✓		
27	Vacancy				
1	Mr. HALL - TX	✓			
2	Mr. SENSENBRENNER - WI				
3	Mr. LAMAR SMITH - TX				
4	Mr. ROHRBACHER - CA	✓			
5	Mr. BARTLETT - MD			✓	
6	Mr. EHLERS - MI		✓		
7	Mr. LUCAS - OK				
8	Mrs. BIGGERT - IL		✓		
9	Mr. AKIN - MO	✓			
10	Mr. NEUGEBAUER - TX	✓			
11	Mr. INGLIS - SC	✓			
12	Mr. McCAUL - TX	✓			
13	Mr. DIAZ-BALART - FL	✓			
14	Mr. BILBRAY - CA	✓			
15	Mr. ADRIAN SMITH - NE	✓			
16	Mr. BROUN - GA	✓			
17	Mr. OLSON - TX	✓			
	TOTALS	11	25	1	

Chairman GORDON. Thank you. The nays prevail.

The next amendment, the fourth amendment on the roster is also offered by the gentleman from Florida, Mr. Diaz-Balart. Are you ready to proceed with your amendment?

Mr. DIAZ-BALART. Yes. Thank you, Mr. Chairman.

Chairman GORDON. The clerk will report the amendment.

The CLERK. Amendment number 022, amendment offered by Mr. Mario Diaz-Balart of Florida to the amendment offered by Mr. Gordon of Tennessee.

Chairman GORDON. I ask unanimous consent to dispense with the reading. Without objection, so ordered.

I now recognize the gentleman for five minutes to explain his amendment.

Mr. DIAZ-BALART. Thank you, Mr. Chairman. I think I am going to be more brief because I kind of have an inkling of where things are going. Just call me crazy, but I am good at grasping the obvious.

Mr. Chairman, very similar, this amendment would simply strike out the last—the out-year funding of the bill to make it a three-year bill. By doing that, it would reduce spending in this bill by \$37.02 billion. I think we have already heard the arguments and I don't think, Mr. Chairman, that we need to hear them again.

Chairman GORDON. I think Mr. Diaz-Balart has given us all the arguments here. So is there any further discussion?

Mr. HALL. Mr. Chairman.

Chairman GORDON. Mr. Hall.

Mr. HALL. I will be brief. I am for it.

Chairman GORDON. As Mr. Diaz-Balart has said, we have discussed this a variety of time already. By cutting from five to three, you don't really save any money for those first three years and we lose the continuity in the out years.

So if there is no further discussion, all in favor of the amendment say aye. Opposed, no. The no's have it and the amendment is not agreed to.

Mr. DIAZ-BALART. Mr. Chairman, I have an inquiry of the Chair.

Chairman GORDON. Yes, sir.

Mr. DIAZ-BALART. Mr. Chairman, I have an amendment later on which would have been if this were to pass in another part of the bill. Should I withdraw that now or—because I think I kind of know where that is going to go as well.

Chairman GORDON. I would defer to your counsel.

Mr. DIAZ-BALART. Okay. We can withdraw then later, Mr. Chairman. Thank you.

Chairman GORDON. The next amendment on the roster is an amendment offered by the gentleman from California. Are you ready to proceed with your amendment?

Mr. ROHRBACHER. I am, Mr. Chairman. Thank you very much.

Chairman GORDON. The clerk will report the amendment.

The CLERK. Amendment number 038, amendment offered by Mr. Rohrabacher of California to the amendment offered by Mr. Gordon of Tennessee.

Chairman GORDON. I ask unanimous consent to dispense with the reading. Without objection, so ordered.

I recognize the gentleman for five minutes to explain his amendment.

Mr. ROHRABACHER. Thank you very much, Mr. Chairman.

This amendment reduces the authorization for ARPA-E, specifically ARPA-E, from 10 years in the current legislation to three years, and let us just note that we have responsibility in this committee not only for authorization but also oversight. The responsibility of this committee is not just to authorize but to oversee spending. I believe that providing us a little extra time before we authorize something for 10 years that we need some more time for oversight.

Let me just, before I go on with the rest of this presentation in terms of my amendment, I would like to thank the Chairman for the good job that he has done and for the very fair and efficient way that he has handled this committee and put up with us who have some fundamental disagreements with him. You will be missed as Chairman of this committee, and I just thought I would mention that before I go on with these arguments. Thank you, Mr. Chairman.

Chairman GORDON. Thank you, Mr. Rohrabacher, but you are not going to miss me for a while because I am going to be around and we will be working together on some things.

Let me just, for the record, be sure that it is noted that the last amendment did not pass. Also, Mr. Rohrabacher, certainly you know I have an affection for ARPA-E and you are doing what you think is best for the country and there is nothing personal whatsoever. Once again, this committee will have the option to have oversight. We can have it every day, every week, however you want to do it. So I think there will be plenty of oversight on ARPA-E, and I welcome it. I think that the more daylight it gets, the better it is going to look, and so—

Mr. ROHRABACHER. Well, let me explain briefly, Mr. Chairman, reclaiming my time—

Chairman GORDON. Yes, sir.

Mr. ROHRABACHER. —why I believe that for us to have proper oversight we cannot just simply authorize this effort for 10 years out before we have actually been able to assess what has happened in its first full year of funding. ARPA-E, which is a concept that I support, has just embarked on its mission and we need to find out whether or not as the program is actually being handled whether or not they are really funding high-risk projects or whether they are funding projects that could have happened anyway, are they really funding projects that are unique enough that they need to be spending the money in that area rather than perhaps funding projects that are duplicative of things in other parts of Department of Energy, for example. So it would seem to me that before we actually even have one year of activity on the part of ARPA-E that we then authorize it for 10 years out. What is the harm of saying we are only going to do this for three years and then we will assess the job that ARPA-E is doing to see if it is indeed meeting the goals that we had in mind when ARPA-E passed in the first place. So this gives us a chance not just to spend money, and as people can tell by the record, we have a difference of opinion as to what level of spending is justified, but beyond that, we should make sure

that whatever money is spent, there shouldn't be any argument over what money is spent whether or not we are actually providing the oversight to make sure the money is being spent wisely, and my amendment would simply give this committee the opportunity to assess ARPA-E after its first three years of active duty and to see whether or not some changes need to be made rather than authorizing it out for a 10-year period.

I yield back the balance of my time.

Chairman GORDON. Dr. Baird is recognized.

Mr. BAIRD. Mr. Chairman, in listening to the argument that by shortening an authorization we somehow save money for the taxpayer, I think I am going to save my family money by just not feeding my kids. They are five now, and once they reach seven I am just going to quit feeding them and that is going to help my budget a great deal because we will save a lot of money by not feeding them.

Mr. ROHRABACHER. That is not my argument about saving money.

Mr. BAIRD. Okay. Well, let us deal with the second question, which is, your quote was, "What is the harm?" I think we have described the harm. The harm is, you undermine the ability of individuals, organizations, businesses, et cetera to make plans on the anticipation that there will be a reliable opportunity to compete for these funds.

As far as the oversight, you know, I spent three days participating in the ARPA-E forum that they had over at the National Harbor, and I will tell you, speaking personally, I think ARPA-E is the most exciting thing happening in the United States Government today. I truly believe that. I honestly do. I think if there is anything that has come out of this Congress in the last four or five years that is really going to turn this country around, it is going to be something that emerges from the funding from ARPA-E. That is why I am so excited about it.

I share passionately my colleagues', Mr. Diaz-Balart, Mr. Rohrabacher, Mr. Broun's commitment to trying to reduce our deficit. I honestly believe that one of the things that is going to help reduce our deficit in the long run is ARPA-E because it is going to reduce our dependency on foreign oil, because it is going to lower our energy consumption and because it is going to make America so competitive with the rest of the world.

And the final point I would make is, if you compare what we are spending on ARPA-E with other spending in this bill, it is actually relatively small, and more problematic still, if you compare what we are spending on ARPA-E with what other nations, notably China and other countries are spending on their energy research budget, it is frighteningly small, and so for that reason I would certainly not want to cut either the funding levels or the duration of ARPA-E.

Mr. ROHRABACHER. Would the gentleman yield?

Mr. BAIRD. I would be happy to yield.

Mr. ROHRABACHER. And I appreciate your passion for ARPA-E and its mission, and I happen to believe that the mission is a good mission. But again, I don't really think that you have addressed the idea of why then should we not—why should we just give it a

10-year authorization rather than saying after three years we are going to find out, see if we can perfect it even more, or we can then take a look and make sure it is doing the job that you so passionately believe it should be doing.

Mr. BAIRD. I think three years is just too brief. I just think, you know, if you—the way ARPA-E is working is, they are having funding put out in tranches, so they are now on their third, and if you look at the diversity of technologies, but, you know, these things take some time to build up and people are going to be saying, okay, so we are going to try to get our research and engineering and production, et cetera, to a point where we think we can compete meaningfully for ARPA-E, and that may take them several years to get there and at some times they are going to be rejected by ARPA-E in one of the application processes. They are going to go back to the drawing board as good scientists and engineers do and they are going to come back and make another run at it and they will have something better. But if we say to them, you know, you really can't count on ARPA-E being there in the long run or even in the relatively near run, I think we are going to set that back. And we may disagree. You know, maybe somewhere between three and ten years we might find agreement. I think three is too short.

Chairman GORDON. Mr. Hall is recognized.

Mr. HALL. Mr. Chairman, I actually support Mr. Rohrabacher's amendment. I ask unanimous consent to revise and extend because ARPA-E is still in the formative stages. It makes a lot of sense to keep this authorization shorter so Congress could reevaluate it in a couple of years and address any concerns or problems.

Yield back my time, and I thank Mr. Rohrabacher.

Chairman GORDON. Thank you, Mr. Hall.

Let me just remind Mr. Rohrabacher that any program that can be authorized can be unauthorized and so we do not have to wait to the end of it. We can have, and I would hope there will be frequent transparent oversight. I think it is sort of like you, Mr. Rohrabacher, the more you see, the more you will like it.

So if there no further discussion, the vote occurs on the amendment. All in favor of the amendment say aye. Those opposed say no. The amendment is not agreed to.

The sixth amendment, the next amendment on the roster is an amendment offered also by the gentleman from California. Mr. Rohrabacher, are you ready to proceed with your amendment?

Mr. ROHRBACHER. I am.

Chairman GORDON. I have an amendment at the desk. Excuse me. The clerk will report the amendment.

The CLERK. Amendment number 033, amendment offered by Mr. Rohrabacher of California to the amendment offered by Mr. Gordon of Tennessee.

Chairman GORDON. I ask unanimous consent to dispense with the reading. Without objection, so ordered.

I recognize the gentleman for five minutes to explain his amendment.

Mr. ROHRBACHER. This second amendment actually instead of taking the authorization down to three years, understanding the wisdom of Mr. Baird's last statement, perhaps three years wasn't

responsible or reasonable enough and actually this just takes the authorization down to five years and, I would add, it makes the authorization of ARPA-E consistent with the authorization in the rest of this legislation, and so that is basically it. The arguments still hold. Hopefully this is more reasonable and meets Mr. Baird's threshold.

Chairman GORDON. Mr. Rohrabacher, in respect to your good faith, we will accept this amendment.

Mr. BAIRD. Mr. Chairman, I just want to echo that myself. Personally, I think that is a timeline that makes good sense to me and I am happy to support as well.

Mr. ROHRABACHER. Mr. Chairman, I accept your acceptance.

Chairman GORDON. It is my understanding that—oh, let us see. If there is no further discussion, all those in favor say aye. Opposed, nay. The ayes have it, and Mr. Rohrabacher wins one.

I understand that Mrs. Biggert wants to be recognized.

Mrs. BIGGERT. Yes, Mr. Chairman. I have an amendment at the desk.

Chairman GORDON. The clerk will report the amendment.

The CLERK. Amendment number 102, offered by Mrs. Biggert of Illinois to the amendment offered by Mr. Gordon of Tennessee.

Chairman GORDON. I ask unanimous consent to dispense with the reading. Without objection, so ordered.

I recognize the gentlelady for five minutes to explain her amendment.

Mrs. BIGGERT. Thank you.

This is an amendment which would reduce the funding per year on page 16 of the bill. I am sorry. I am having a little trouble locating this. Several of my colleagues before me have proposed ways to reduce the proposed spending of ARPA-E, and I didn't want to cut the years off the authorization. I don't think that is the best way to go. But I thought maybe I could propose slightly lower numbers that might meet a compromise. I appreciate all you have done to consider our spending concerns and thought that we might be able to work together to lower ARPA-E's funding levels as we have in other parts of the bill since we did take out the clause that the Office of Science would be funded before the dollars went to ARPA-E.

In testimony before this committee, Secretary Chu suggested the funding levels proposed in your amendment but that was before he was the Secretary. In fact, it was in 2006 and a lot has changed since that time.

So this would propose that the funding levels would be \$300 million in 2011, \$400 million in 2012, \$500 in 2013 and then in 2014 \$600 million and \$700 million for fiscal year 2015, and I think that would actually cut the authorization from \$2.1 billion—from \$3.1 billion to \$2.1 billion, and I would ask for your consideration.

Chairman GORDON. Thank you. The Chairman recognizes himself for five minutes.

Once again, I will remind everyone that we have already cut this bill by over 10 percent. The out-year number for ARPA-E was the minimum number that was recommended by the *Rising Above the Gathering Storm* committee.

Is there anyone else?

Mr. BARTLETT. Mr. Chairman.

Chairman GORDON. Dr. Bartlett.

Mr. BARTLETT. Yes. There is a little confusion here because I thought the amendment before us was your manager's amendment. Her amendment to the amendment is on page 16 of the amendment to the amendment in the nature of a substitute offered by Mr. Gordon of Tennessee. When does that come before us?

Chairman GORDON. The manager's amendment has already been—

Mr. BARTLETT. You have two amendments. You have the manager's amendment and then you have the amendment to the manager's amendment, and her amendment is to the amendment to the manager's amendment, not to the manager's amendment.

Chairman GORDON. I am advised that—

Mr. BARTLETT. I looked for page 16 in the manager's amendment with numbers on it in vain. Then I found the amendment to the amendment in the nature of a substitute offered by Mr. Gordon, and sure enough, on page 16 of that amendment, I found the numbers that Mrs. Biggert is talking about.

Chairman GORDON. Well, the astute Mr. Bartlett has found something here, and we are getting our able counsels together to get you a good answer.

Mr. WILSON. Point of order. If that is the case, it sounds to me that it is a third-order amendment and therefore should be ruled out of order.

Chairman GORDON. Dr. Bartlett, the bipartisan counsel confab here has said that it is in proper order. The bottom line is that the gentlelady's amendment would reduce the appropriations for ARPA-E over the five-year period, and as I pointed out earlier, we have already reduced the overall budget cuts, but my understanding is that we are moving forward in the proper way.

Mr. BARTLETT. Will we at any point consider your amendment to the amendment in the nature of a substitute offered by Mr. Gordon of Tennessee or will we by unanimous consent agree that that is now part of the manager's amendment?

Chairman GORDON. It is the next vote. We are taking the second-degree amendments and then the next vote will be on the manager's amendment.

Mr. BARTLETT. But when will your amendment in the nature of a substitute offered by Mr. Gordon of Tennessee—this is an amendment to the amendment in the nature of a substitute. It was in my packet, and it is page 16 of that amendment that she refers to in her second-degree amendment.

Chairman GORDON. I am advised by counsel that at the end, all 54 amendments will be addressed including the amendment in the nature of a substitute.

Mr. BARTLETT. Okay. Thank you. So the amendment really before us is not the manager's amendment, it is the amendment to the amendment in the nature of a substitute offered by Mr. Gordon. Is that correct? That is correct?

Chairman GORDON. That is correct but it is my understanding that those are synonymous terms.

Mr. BARTLETT. But they are two different pieces of paper. Okay. Thank you very much.

Chairman GORDON. Thank you, Dr. Bartlett. Is there any further discussion?

Mr. BAIRD. Mr. Chairman.

Chairman GORDON. Dr. Baird is recognized.

Mr. BAIRD. Just very briefly. You know, there has been a lot of talk about public spending, and there should be a lot of talk about that. I will tell you back home, the folks I represent, when you ask them how do you want money spent on energy research, they are often going to say, I want it spent on something that is going to create American jobs, that is going to lower my cost of energy, that is going to reduce our dependence on foreign oil, and I think that is what ARPA-E does. And I am very loathe to do what I am about to do but I think it is necessary.

ARPA-E focuses on those things that I think are going to be game-changing research, as do much of the other DOE labs, but if you look at the ARPA-E budget relative to the DOE labs like Argonne, for example, Argonne gets a billion dollars a year, a billion. Now, they do important research there. I don't dispute that. But it is double or treble what ARPA gets. And we don't yet know the results of ARPA fully but I would submit that if you look at the broad spectrum of innovative energy research funded under ARPA and you put it to the test of the average person in the general public and say does this make some sense to you, I think it is favorably towards Argonne, and I am not going to call for the cutting or reduction of Argonne for a second. I would not do that. But I would put that budget, which is several factors higher than the budget for ARPA, up for comparison and suggest that before we start cutting ARPA, if we are to start cutting ARPA, then we need to start looking at some other things as well, and I am not inclined to do that because I think it would be a mistake but I think it is an equally egregious mistake to go after ARPA, and I will yield back.

Chairman GORDON. Is there further discussion on the amendment? Mrs. Biggert.

Mrs. BIGGERT. Thank you.

You know, I really do support ARPA, I do support the Office of Science, and you hit me in the heart with Argonne. But I think that all of the labs are very, very important and they serve a purpose that is, what I think probably is larger than what we are starting out with with ARPA-E. ARPA-E is for innovation and creativity that comes from the outside but the labs themselves have all had very, very expensive projects. Let us take the Advanced Photon Source, which has to be upgraded now. These are all things that are in progress and I think that ARPA-E is a new program and I just thought that when we had put in ARPA-E that it would be at a funding level which would not reduce the cost of the Office of Science, and that was removed so I just thought we would reduce it, and I did give you wrong numbers because I didn't think that this was the right place for this. But \$2.5 billion from \$3.15 billion. Again, I can understand why you wouldn't want to do that and so we have a disagreement.

Chairman GORDON. Thanks, Mrs. Biggert. You know, I think this discussion is a little bit like saying, which of your children is the cutest. You know what I mean? All these programs are important.

There is a synergy as they work together, and I think they will all benefit each other.

Is there further discussion on the amendment? If no, the vote occurs on the amendment. All in favor, say aye. Opposed, no. The no's have it. The amendment is not agreed to.

Are there further amendments to the manager's amendment? If no, the vote occurs on the amendment. All in favor, say aye. Opposed, no. The ayes have it. The amendment is agreed to.

The seventh amendment is an amendment offered by the gentlelady from Texas, Ms. Johnson. Are you ready to proceed with your amendment?

Ms. JOHNSON. Yes, Mr. Chairman, I have an amendment at the desk.

Chairman GORDON. The clerk will report the amendment.

The CLERK. Amendment number 114, amendment to the amendment in the nature of a substitute offered by Ms. Eddie Bernice Johnson of Texas.

Chairman GORDON. I ask unanimous consent to dispense with the reading. Without objection, so ordered.

I recognize the gentlelady for five minutes to explain her amendment.

Ms. JOHNSON. Thank you, Mr. Chairman and Ranking Member and Members of the Committee. I want to thank you for your attention and commitment to this legislation.

It has been an uphill battle in getting equality for women when it comes to reaching the higher echelons of scientific achievement. As women continue to be underrepresented in most STEM fields, we must do more to create opportunities to educate and retain them, especially at the university faculty level. A National Academies publication, *Beyond Bias and Barriers: Fulfilling the Potential of Women in Academic Science and Engineering*, provides specific policy directives to help accomplish this goal.

Based on the National Academies' recommendation, I have introduced the *Fulfilling the Potential of Women in Academic Science and Engineering Act*, which I first introduced in the 110th Congress and now reintroduced in the 111th. I would like to thank Representatives Donna Edwards, Suzanne Kosmas, Marcia Fudge, Charles Wilson, Alan Grayson and Kathy Dahlkemper, who were cosponsors, and I invite the rest of the Full Committee to be cosponsors of *Fulfilling the Potential of Women in Academic Science and Engineering Act*. I thank the American Association of University Women, National Coalition for Women and Girls in Education, the Society of Women Engineers, the National Science Teachers Association, the American Chemical Society and others for supporting this amendment.

This committee has held many hearings where distinguished experts testified about the combination of factors that leads to the failure of women to obtain careers in areas such as computer science, physics and engineering. *Beyond Bias and Barriers* provides clear guidelines to universities, federal agencies, professional organizations and to Congress on what actions to take to reduce gender bias at the university level. *Beyond Bias and Barriers* also recommended that higher education organizations form an inter-institution monitoring organization, and that scientific and profes-

sional societies help set professional and equity standards for the activities that they lead, such as awards and conferences. As stated in *Beyond Bias and Barriers*, systemic differences between male and female scientific and mathematical aptitude and ability do exist. It is clear that they cannot account for women's underrepresentation in academic science and engineering. I am pleased to see that many of these recommendations are reflected in this amendment to be offered to America COMPETES.

First, my amendment creates a workshop for women to enhance gender equity in the academic STEM environment. Secondly, it establishes a directive for science agencies to establish policies for extended grant support and interim technical support for researchers needing a leave of absence for caregiving responsibilities. Third, it requires more thorough data regarding federal grant awards and positive incentives for academic institutions that are proactive in terms of gender sensitivity and equal opportunities for our female scientists.

Many experts, policymakers, educators and other professionals feel that not nearly enough is being done to educate persons of influence on the subtle gender bias that exists. Gender bias is holding women back from achieving at the same level as their counterparts.

This is a good amendment. I have been called by many college presidents to push forward with it, and so I urge my colleagues to support this amendment.

Thank you, Mr. Chairman. I yield back the balance of my time. I thought I would go over.

[The prepared statement of Ms. Johnson follows:]

PREPARED STATEMENT OF REPRESENTATIVE EDDIE BERNICE JOHNSON

Thank you, Mr. Chairman and Ranking Member.

I want to thank you for your attention and commitment to this legislation.

It has been an uphill battle in getting equality for women when it comes to reaching the higher echelons of scientific achievement.

As women continue to be under-represented in most STEM fields, we must do more to create opportunities to educate and retain them, especially at the university faculty level.

A National Academies publication called, "Beyond Bias and Barriers: Fulfilling the Potential of Women in Academic Science and Engineering," provides specific policy directives to help accomplish this goal.

Based on the National Academies' recommendations, I have introduced the Fulfilling the Potential of Women in Academic Science and Engineering Act, which I first introduced in the 110th Congress and re-introduced in the 111th Congress.

I would like to thank Representatives Donna Edwards, Suzanne Kosrnas, Marcia Fudge, Charles Wilson, Alan Grayson and Kathy Dahlkemper who are co-sponsors of the Fulfilling the Potential of Women in Academic Science and Engineering Act.

I thank the American Association of University Women, National Coalition for Women and Girls in Education, the Society of Women Engineers, the National Science Teachers Association, the American Chemical Society and others for supporting this amendment.

This committee has held many hearings where distinguished experts testified about the combination of factors that leads to the failure of women to attain careers in areas such as computer science, physics, and engineering.

Beyond Bias and Barriers, provided clear guidelines to universities, federal agencies, professional organizations and to Congress on what actions to take to reduce gender bias at the university faculty level.

Beyond Bias and Barriers also recommended that higher education organizations form an interinstitution monitoring organization, and that scientific and professional societies help set professional and equity standards for the activities that they lead, such as awards and conferences.

As stated in *Beyond Bias and Barriers*, "if systematic differences between male and female scientific and mathematical aptitude and ability do exist, it is clear that they cannot account for women's underrepresentation in academic science and engineering."

I am pleased to see that many of these recommendations are reflected in this amendment to be offered to America COMPETES.

First, my amendment creates a workshop program to enhance gender equity in the academic STEM environment;

Second, it establishes a directive for science agencies to establish policies for extended grant support and interim technical support for researchers needing a leave of absence for care giving responsibilities;

Third, it requires more thorough data regarding federal research grant awards; and positive incentives for academic institutions that are proactive in terms of gender sensitivity and equal opportunities for female scientists.

Many experts, policymakers, educators, and other professionals feel that not nearly enough is being done to educate persons of influence on the subtle gender bias that exists.

Gender bias is holding women back from achieving at the same level as their counterparts. Gender-equity should be something we can all agree on.

This is a good amendment and I would like to thank Members of this committee for their hard work to address this important cause.

I urge my colleagues to support this amendment.

Thank you, Mr. Chairman. I yield back.

Chairman GORDON. Thank you, Ms. Johnson. It is well documented, as you point out, that women and minorities are underrepresented in STEM fields. You have been a champion in trying to rectify that, and this is one more step forward in making our country more competitive.

Is there further discussion on the amendment? If no, then the vote is on the amendment. All in favor, say aye. Opposed, no. The ayes have it and the motion is agreed to.

The next amendment on the roster is an amendment offered by the gentlelady from Pennsylvania, Mrs. Dahlkemper. Are you ready to proceed with your amendment?

Mrs. DAHLKEMPER. Yes, Mr. Chairman. I have an amendment at the desk.

Chairman GORDON. The clerk will report the amendment.

The CLERK. Amendment 033, amendment to the amendment in the nature of a substitute offered by Mrs. Dahlkemper of Pennsylvania.

Chairman GORDON. I ask unanimous consent to dispense with the reading. Without objection, so ordered.

I recognize the gentlelady for five minutes to explain her amendment.

Mrs. DAHLKEMPER. Thank you, Mr. Chairman, and thank you, Ranking Member Hall, for allowing me to offer this critical amendment. I want to thank you also for your leadership regarding this, I think, critical bill. I know it holds special importance to you, Mr. Chairman, and so it is timely also for our manufacturers, our current and future workforce, our educators and our economy.

My amendment adds an important component to the National Science Foundation's efforts to enhance and to grow our Nation's manufacturing sector. It directs the Director of the National Science Foundation to award grants to strengthen and expand scientific and technical education and training in advanced manufacturing, including through the Foundation's Advanced Technology Education program. We know that manufacturing education is an essential component to America's competitiveness abroad and an

absolute necessity in keeping and growing jobs in our community and our economy. If we do not take meaningful steps to begin to close that gap between the skills and the talents of workers and the advanced manufacturing needs of employers, we will continue to experience the devastating impact in our communities across the Nation as more and more of our economic future is outsourced to other countries.

This amendment ensures the investments in developing a workforce that meets the needs of the next generation of American manufacturing by prioritizing the inclusion of timely and relevant manufacturing education as a part of NSF'S Advanced Technical Education program, which emphasizes development and curriculum that will enhance the manufacturing knowledge and training of undergraduates in the scientific and technical fields as well as that of the elementary and postsecondary instructors and practitioners.

Awarding grants in the area of strengthening and expanding manufacturing education also serves another important purpose: to provide opportunities for employees to maintain the relevant skills and training that will allow them to compete as the field of manufacturing grows more complex. Providing workers with the career development necessary to keep pace with the growth in their field is critical to job stability and job mobility. We want our Nation's scientific and technical workers to have the tools they need to perform successfully both here and abroad.

Mr. Chairman, ensuring that America is able to compete in a rapidly changing global economy starts with making vital investments that guarantee educational and training systems that are robust in resources as well as results. I believe this amendment helps us do just that and I urge my colleagues' support, and I yield back.

Chairman GORDON. Thank you, Mrs. Dahlkemper, for that excellent amendment. Is there further discussion? If no, the vote occurs on the amendment. All in favor, say aye. Opposed, no. The ayes have it. The amendment is agreed to.

Dr. Broun is next. For any of you that have come in later, sort of the ground rules that were set were that when your time comes up for an amendment, if you are not here, someone can introduce it for you, or we will come back and pick you at the end so that you can't just be coming in and everybody else has to grind it out. So Dr. Broun is not here but he can come back, and Mr. Inglis is here. The clerk will report the amendment.

The CLERK. Amendment 017, amendment to the amendment in the nature of a substitute offered by Mr. Inglis of South Carolina.

Chairman GORDON. I ask unanimous consent to dispense with the reading. Without objection, so ordered.

I recognize the gentleman for five minutes to explain his amendment.

Mr. INGLIS. Thank you, Mr. Chairman.

This amendment amends the NSF prize language from Dr. Lipinski to ensure that federal research grant dollars are not used to meet the requirements for a prize award. It is essentially an attempt to prevent double dipping and echoes an H-Prize provision that prevented federal employees from participating using federal dollars to compete for other federal dollars in the form of a prize. And I believe that Dr. Lipinski wanted to engage in a colloquy

about that, and I am happy to yield to him if this would be an appropriate time.

Mr. LIPINSKI. If Mr. Inglis would like to yield?

Mr. INGLIS. I would be happy to yield.

Mr. LIPINSKI. I appreciate the concern about double dipping, and I know this is something on the H-Prize which we worked on together. Really, you had the original author of that and we got that done under my authorship but we worked on this issue in there and put some language in there to prevent the double dipping. I appreciate Mr. Inglis wants to prevent what he sees as double dipping. I have a little bit of a concern on this, and I definitely think we should prevent double dipping. I have a little bit of a concern that it is a little bit too broad the way that the—if you are talking about federal employees, certainly I think that we want to prevent what would definitely be seen as double dipping. If you are receiving an NSF grant, though, I am afraid that this might say that anyone who has ever received any NSF funding would not be eligible for a prize.

I think that—I would be happy to accept this amendment if Mr. Inglis would agree that we will continue to work on this and maybe try to narrow it down a little bit to make sure that we are getting exactly what we want to get in this amendment and then we could move forward in the manager's amendment as the bill comes to the Floor, if we could work on that language to clarify and narrow this amendment. If Mr. Inglis would agree to that, then I would be happy to accept the amendment.

Mr. INGLIS. And reclaiming my time, I am happy to agree to that, Dr. Lipinski, and Mr. Chairman, I think it makes sense to figure out—we are both trying to accomplish the same thing. We want to see that there is not double dipping, and at the same time we don't want to cut off the creativity of people who may have received NSF grants that are unrelated to the work that they are doing related to the prize, so there may be somebody who has an NSF grant in his or her time on their own, at night is thinking about the solution to a key issue that confronts us and unrelated to their funding from their NSF grant may provide the breakthrough, so we surely want to reward that kind of after-hours effort. We just don't want there to be double dipping because it would violate the spirit of the prize.

And I would be happy to yield further to Dr. Lipinski.

Mr. LIPINSKI. I think this is going to take a little bit more discussion about what exactly—it is very difficult, in the scientific endeavor, to separate out one piece of work from another piece of work that someone engages in, so I think that as we discuss this and consult also with others on this as we have begun to do here, I am sure that we can work this out, and I appreciate Mr. Inglis's desire to make sure that we are saving money. No taxpayer wants to see anyone as a double dipper. We are trying to save money here and cut the deficit. So I appreciate Mr. Inglis's work on this.

Mr. INGLIS. So it sounds like I have an acceptable amendment, Mr. Chairman, which is an exciting thing.

Chairman GORDON. Well, Mr. Inglis, you have demonstrated—you and Dr. Lipinski have demonstrated an effort to work colle-

gially and productively on this issue, and I am sure you will continue with that.

So if there is no further discussion, the vote occurs on the amendment. All in favor, say aye. Opposed, no. The ayes have it and the amendment is agreed to.

The next amendment on the roster is an amendment offered by the gentleman from Texas, Mr. Hall. Are you ready to proceed with your amendment?

Mr. HALL. I am. I have an amendment at the desk.

Chairman GORDON. The clerk will report the amendment.

The CLERK. Amendment number 012, amendment to the amendment in the nature of a substitute offered by Mr. Hall of Texas.

Chairman GORDON. I ask unanimous consent to dispense with the reading. Without objection, so ordered.

I recognize the gentleman for five minutes to explain his amendment.

Mr. HALL. Mr. Chairman, the Academic Research Facilities Modernization Program was a bricks and mortar for university programs at the National Science Foundation. It was first authorized in 1988. It was essentially dormant from the early 1990s until the Administration revised it in the American Recovery Act. I simply don't believe it is the Federal Government's role or responsibility to construct or renovate university science labs and buildings. Funding bricks-and-mortar projects takes much-needed research dollars away from actually performing research. The NSF already funds major research facilities with multiple users as well as major research instrumentation. I believe these provide valuable assets for our Nation but a program such as ARI [Academic Research Infrastructure Program] that allows schools to apply for grants to improve their facilities is ripe for potential future earmarks. I believe, Mr. Chairman, that you share my belief that NSF remain an earmark-free entity. I move the passage of this amendment.

Chairman GORDON. The gentleman—thank you.

Mr. HALL. Mr. Chairman, while the amendment doesn't affect the current solicitation for projects under the American Recovery Act, it does repeal this program in fiscal year 2011. That is the only difference.

Chairman GORDON. Thank you, Mr. Hall. The Chair recognizes himself.

I am torn on this, Mr. Hall, in that conceptually I agree with you. This has been a program that has been authorized since 1993. It has not been funded for the reasons that you spoke eloquently about. However, I think it does make that sense that for those anomalies, and we saw that anomaly with this recent tremendous recession, that there might be occasions where it could be beneficial. So I think it is beneficial to keep it in the toolbox but that it is something that should not be used as earmarking and taking funds away from the National Science Foundation. And for that reason, I modestly and reluctantly oppose your amendment.

Mr. LIPINSKI. Mr. Chairman.

Chairman GORDON. Dr. Lipinski.

Mr. LIPINSKI. Thank you, Mr. Chairman.

I know that the gentleman from Texas has the best interests of taxpayers at heart, as he always makes sure that he does as the

Ranking Member here. I, a little bit more strongly, oppose this amendment. I think that the—if you go back in the history of this, you see—I know Mr. Hall is concerned about earmarking. One of the reasons this was put in was that we saw that there was earmarking that was going on by Congress and thought that—Congress believed that this was the way to make sure that you have independent—have the NSF deciding where the funding is going to go.

My concern is that we are—we have \$3.5 billion in needed renovations, according to the 2005 survey of science and engineering research facilities. We have only seen an increase in that need with the recession, and the concerns are twofold. One is that if we do not have these state-of-the-art lab spaces, networks, instruments, computing facilities, that we will not be spending the funding that we are giving in regards to grants for research. We will not be spending that as efficiently because we do not have the facilities that are needed to do the best research.

The other concern I have is, I have certainly heard conducting hearings, a hearing on this, and listening sessions I held with universities, other institutions, said that there is great concern that we are losing researchers to countries, especially such as China that are investing significantly in their facilities and that we are training—we are the best at training scientists and engineers here in this country, but more and more we are losing these researchers to other countries that are offering better facilities, and I think that is another concern that I have. We are not—we have not appropriated funding. Congress has not appropriated funding for this in recent years except for the Recovery Act. I think it is important that we keep this in there, especially as we await the next report on what kind of deferred maintenance is going on, especially, as I said, I think it will be even worse now with the recession especially hitting the state institutions and state universities.

So I appreciate the concern that Mr. Hall has but I definitely have to oppose this amendment. I yield back.

[The prepared statement of Mr. Lipinski follows:]

PREPARED STATEMENT OF REPRESENTATIVE DANIEL LIPINSKI

Thank you Chairman Gordon for all of your leadership and work on this bill. Like the original COMPETES Act, this reauthorization takes important steps toward laying the foundation for the future competitiveness of our country through vital and targeted investments in education, research, energy, and manufacturing.

My amendment would create jobs and support American manufacturers by improving procurement at our National Labs and accelerators. It requires the Director of the DOE Office of Science to develop a plan for increasing purchases from domestic sources, especially purchases of hardware and instrumentation that we do not currently manufacture.

The primary target of this amendment is not so-called “Commercial-Off-The-Shelf,” or COTS hardware, but rather custom manufactured components that are used to build accelerators and other large scientific instruments. By fostering closer collaboration between Office of Science facilities and the small manufacturers who could fabricate these specialized parts, this amendment will result in faster, more efficient procurements and products that better meet the precise scientific needs of our Labs.

This amendment supports high-skill, high-wage engineering, machining, assembly, and testing jobs at small companies throughout the country. These are manufacturing jobs that support innovation not only at our National Labs, but also in the petrochemical, semiconductor, and biotechnology sectors. We need these jobs and

the ability to manufacture cutting-edge equipment, and I urge my colleagues to support this amendment.

Remarks opposing the Hall amendment to strike the Academic Research Facilities Act. Note that remarks as delivered differ *significantly* from text below.

While I know that the gentleman from Texas has the best interests of taxpayers at heart, I oppose his amendment. I do not see the benefit in striking the Academic Research Facilities Modernization Act generally, and think that now is certainly the wrong time to do it.

The COMPETES Act aims to strengthen our national economic competitiveness by investing in basic research, STEM education and innovation. But STEM education and cutting-edge R&D needs state-of-the-art lab space, networks, instruments, and computing facilities, and in these areas we are falling behind our competitors. While countries like China are investing in all aspects of their R&D ecosystems, the recession has stopped US research universities—especially public ones—from upgrading or even maintaining their research infrastructure.

This means we are spending our Federal research dollars inefficiently, supporting scientists handicapped by outdated instruments and laboratories. It also means that we will find it harder and harder to attract top scientists and engineers and to remain the worldwide leader in basic research.

The 2005 Survey of Science and Engineering Research facilities found that academic institutions were deferring \$3.5 billion in needed renovations. As I have visited with academic leaders around the country, I've heard them all say the same thing—it's gotten worse since 2005. *Now* is not the time to remove this tool from the NSF's toolbox.

Adopting this amendment would not necessarily save any money either. The ARI program has not issued a grant since 1996. Yes, the NSF is expected to give out Recovery Act grants over the next two months, but that's just another reason not to adopt this amendment. It would be prudent to wait and see how well these grants work before repealing the language that made them possible.

Leaving the Academic Research Facilities Act on the books gives Congress and the NSF another tool for unexpected situations or emergencies. This language has done no harm for over a decade, and I see no reason to repeal it now, just before the new grants take effect and when we know the level of University funds for repair and renovation of scientific facilities is at an all time low.

I urge my colleagues to vote NO on the amendment.

Thank you.

Mr. HALL. Mr. Chairman.

Chairman GORDON. Mr. Hall is recognized.

Mr. HALL. My colleagues are concerned about this. I understand the problem. I would have no problem working with you, Mr. Chairman, to ensure that we are explicit about this. However, I feel pretty strongly that no future funding ought to go to this program. It could probably still be subject to earmarks if earmarks are still in vogue by the time somebody wants to avail them. But I encourage adoption of the amendment. I yield back my time.

Chairman GORDON. If there is no further discussion on the—

Mr. BARTLETT. Mr. Chairman.

Chairman GORDON. Oh, Dr. Bartlett.

Mr. BARTLETT. I agree that we may need to put more money into facilities because you can't have people working where they don't have facilities to work in but I think this is a wrong mission for the National Science Foundation. This is not what they do. They would have to hire a bunch of whole new people to do this, and if the Federal Government is going to support this, I just think it would be better supported somewhere else rather than the National Science Foundation because I don't think that they are traditionally tooled up to do this, and I am not sure they would do a very good job of it.

So I want to support the potential need for federal money to go here, but I am going to support Mr. Hall's motion because I don't

think that the National Science Foundation is the right place to do this. Thank you.

Mr. LIPINSKI. Mr. Chairman.

Chairman GORDON. Dr. Lipinski is recognized.

Mr. LIPINSKI. Thank you. I just want to quickly add, the reason why this was put in the NSF is to avoid the earmarking, so that it would be merit reviewed as everything is in the NSF. They do have the infrastructure in the NSF to be able to do these reviews, and I think that is the appropriate place to do it to make sure, to be best assured that the money is going to the correct places. I yield back.

Chairman GORDON. If there is—

Mr. BARTLETT. I am not sure how you peer review building a building. I don't know how you would do that, which is why I think the National Science Foundation is the wrong place for this. Thanks.

Chairman GORDON. If there is no further discussion, the vote occurs on the amendment. All in favor, say aye. Opposed, no. The no's have it and the amendment is not agreed to.

The next amendment on the roster is an amendment offered by the gentleman from Texas, Mr. Neugebauer. Are you ready to proceed with your amendment?

Mr. NEUGEBAUER. Actually I am, Mr. Chairman, and I ask unanimous consent that I am going to withdraw amendment number 008 and number 013 and ask to proceed with amendment number 026.

Chairman GORDON. Without objection, so ordered. Let us see. Now the clerk will report the amendment.

The CLERK. Amendment 026, amendment to the amendment in the nature of a substitute offered by Mr. Neugebauer.

Mr. NEUGEBAUER. Thank you, Mr. Chairman. I hope it didn't offend you that I withdrew those other—

Chairman GORDON. Mr. Neugebauer, let me—I ask unanimous consent to dispense with the reading. Without objection, so ordered, and I recognize the gentleman for five minutes to explain his amendment.

Mr. NEUGEBAUER. Thank you, Mr. Chairman. I hope it didn't offend you that I withdrew those other two.

You know, Mr. Chairman and I had a fairly robust debate about the match, and I have conceded that point, but what this amendment does is that it says that current law allows them to participate in in-kind. If we are going to move the match from 70 to 30, I am offering an amendment that seeks to make sure that the schools actually put up hard money. So my amendment does not restrict them from providing in-kind services, merely that they cannot be counted towards their 30 percent match.

As we often hear, the Federal Government continues to overpromise and too many underdeliver. This is an opportunity to set pragmatic goals and more realistic levels of funding. My amendment strives to maintain appropriate levels of responsible burden sharing, requiring participating schools to have skin in the game, which is a laudable goal. There is no one at this dais that doesn't see these towns and states and universities scaling back, yet time and time again up here in Washington we fail to do the same. I

think it is time, as we have heard many of my colleagues say, restore fiscal balance and we continue to provide appropriate resources that can provide the continued lead in these leading areas.

So basically, Mr. Chairman, this is pretty straightforward. This says if we are going to change the match from 70 to 30, that universities would have to put up matching funds and not in-kind. It doesn't keep them from doing the in-kind but does make sure that they are putting their money up with it. So with that, I would urge adoption.

Chairman GORDON. Thank you, Mr. Neugebauer. The chairman recognizes himself for five minutes.

As you said, we had a discussion on the other issues. This is a novel one, and I am sympathetic to your concern that it is not gained with a lot of in-kind. My concern, though, is whether NSF needs some flexibility there, and I have not had a chance to discuss it with them. Where I am today, just as a friend, I would have to oppose it because I don't know enough about it but I would still revisit it and see if there is a way to give some flexibility yet ratchet that down. We can either do one of two ways. You can withdraw and we will look at it some more. We will likely vote it down but that doesn't mean that we are through discussing it because I think you are on the right track. I am just not sure what the unintended consequences are because we haven't had a chance to look at it more.

Mr. NEUGEBAUER. Well, I think there is pretty—I think the standards are there, what is in-kind and isn't in-kind.

Chairman GORDON. Whether they need two or three percent, you know, whether there is something that—

Mr. NEUGEBAUER. But I think what happens is, as you know, and you used the correct term, people that get grants have learned to game the system in many cases, and if we are going to increase the federal participation to a very generous level, as you know, and I am conceding the point that I, you know, disagree with, but I think if we are going to concede that the Federal Government is going to put in 70 percent and those are going to be hardballers, I do not think it is unrealistic or unfair to ask those universities to at least come up with 30 percent of their hard money. Many times they are going to use in-kind to perpetrate the program and in many cases some of their hard dollars actually comes from third parties. My piece of legislation doesn't, you know, keep that hard money coming from third parties but what I do think they need to do is to, you know, have skin in the game and I think 30 percent of hard money is realistic. Again, it doesn't preclude them from using other things to, you know, foster the program. If they find that program beneficial, they can use those in-kind things. Because we had a little disagreement on the math but when you go to the 70 percent, you know, you are going to shrink the numbers of programs that are out there because you are going to put more dollars in where you were spreading those dollars out. So I would ask the Chairman to reconsider. If it is voted down, I would hope that he would be true to his commitment to, if we can't work this out today, to work on it moving forward.

Chairman GORDON. I thank my friend, and I reclaim my time.

First, we need to make clear whether you have got a 70 percent match or a 50 percent match or whatever it is, it is the same amount of federal dollars so that doesn't vary. What I would like to do is give—when I say the benefit of the doubt, I would like to go ahead and accept this amendment today but I don't want to mislead you. I want to learn more about it. We may have to deal with it again in the manager's amendment or some way if NSF convinces us that there is some legitimate reason to have some, you know, nominal amount there.

Mr. NEUGEBAUER. I concur with that and would look forward to their response, and after we have seen their response you and I having a dialog about that.

Chairman GORDON. If there further discussion on the amendment? If no, the vote occurs on the amendment. All in favor of the amendment, say aye. Opposed, no. The ayes have it and the amendment is agreed to.

The next amendment on the roster is an amendment offered by the gentleman from Michigan, Dr. Ehlers. Are you ready to proceed with your amendment?

Mr. EHLERS. Yes. I have an amendment at the desk.

Chairman GORDON. The clerk will report the amendment.

The CLERK. Amendment 039, amendment to the amendment in the nature of a substitute offered by Mr. Ehlers of Michigan.

Chairman GORDON. I ask unanimous consent to dispense with the reading. Without objection, so ordered.

I recognize the gentleman for five minutes to explain his amendment.

Mr. EHLERS. Well, this shouldn't take five minutes. This is very straightforward. It simply recognizes a change that has occurred in undergraduate education, particularly in the life sciences. New programs are being developed across the country, and in fact a few of my neighboring colleges have already put these programs into place dealing with sustainability. There is an increased need for that, whether one is an architect or a scientist or life scientist. More and more of these programs are needed because students are getting jobs in those areas and this is just an attempt to upgrade and keep up with the changing times to recognize that sustainability programs should be added to the list of approved activities that grants and transforming undergraduate education and STEM program. So it will simply add that one area of sustainability to the existing grant programs that will be allowed under this legislation. I urge adoption of the amendment.

Chairman GORDON. Thank you, Dr. Ehlers, for your good amendment. Is there further discussion on your amendment? If no, the vote occurs on the amendment. All in favor, say aye. Opposed, no. The ayes have it and the amendment is agreed to, and we are fourth of the way through.

The next amendment on the roster is an amendment offered by the gentleman from Ohio, Mr. Wilson. Are you ready to proceed with your amendment?

Mr. WILSON. Yes, sir, Mr. Chairman. I have an amendment at the desk.

Chairman GORDON. I ask unanimous consent to dispense with the reading. Without objection, so ordered.

I recognize the gentleman for five minutes to explain his amendment.

Mr. WILSON. Thank you, Mr. Chairman.

The amendment I am proposing today builds on the excellent work done by Congresswoman Fudge during a Subcommittee markup. Her addition of the “Grand Challenges in Education Research” section is crucial. I believe it will greatly improve research on pre-K through 12 STEM education.

My amendment is simple. I ask that the National Science Foundation and the Department of Education work together to identify the research challenges in STEM education. They also specifically evaluate the barriers being faced by students in rural schools.

I represent a very rural part of Ohio, and too many of our rural students are struggling to receive an adequate STEM education. Sadly, many of our rural schools lack the resources needed to provide the STEM education necessary for funding for students entering the 21st century workforce. Therefore, I ask my colleagues to support my amendment that would have the Department of Education and the National Science Foundation specifically consider students in rural schools as they work to resolve the current challenge facing pre-K through 12 STEM education. Thank you, Mr. Chairman.

[The prepared statement of Mr. Wilson follows:]

PREPARED STATEMENT OF REPRESENTATIVE CHARLES A. WILSON

The America COMPETES Reauthorization Act of 2010—Full Committee Markup April 28, 2010 Wilson Amendment Colleagues, the amendment I am proposing today builds on the excellent work done by Congresswoman Fudge during a subcommittee markup. Her addition of the “Grand Challenges in Education Research” section is crucial. I believe it will greatly improve research on preK–12 STEM education.

My amendment is simple. It asks that as the National Science Foundation and Department of Education work together to identify and research the challenges in STEM education, they also specifically evaluate the barriers being faced by students in rural schools.

I represent a very rural part of Ohio. Too many of our rural students are struggling to receive an adequate STEM education. Sadly, many of our rural schools lack the resources needed to provide the STEM education necessary for students entering the 21st Century workforce.

Therefore, I ask my colleagues to support my amendment that would have the Department of Education and National Science Foundation specifically consider students in rural schools as they work to resolve the current challenges facing preK–12 STEM education.

Mr. HALL. Would the gentleman yield?

Mr. WILSON. Certainly.

Mr. HALL. I think it is a good amendment. We support it.

Mr. WILSON. Thank you.

Is there further discussion? If there is no further discussion on the amendment, all in favor of the amendment say aye. Opposed, no. The ayes have it and the amendment is agreed to.

The next amendment on the roster is an amendment offered by the gentleman from Maryland, Dr. Bartlett. Are you ready to proceed with your amendment?

Mr. BARTLETT. Yes, sir. I have an amendment at the desk.

Chairman GORDON. The clerk will report the amendment.

The CLERK. Amendment number 011, amendment to the amendment in the nature of a substitute offered by Mr. Bartlett of Maryland.

Chairman GORDON. I ask unanimous consent to dispense with the reading. Without objection, so ordered.

I recognize the gentleman for five minutes to explain his amendment.

Mr. BARTLETT. Mr. Chairman, this is a very simple amendment which supports your commitment to exclude projects from this reauthorization that went unfunded in the original COMPETES bill. This program was not only unfunded up to now, but my understanding is that the National Science Foundation says they have no intent to fund it now, so my question is, why include it? To make the bill relevant, I just would ask that we delete this. If we think that they are in error for doing this, then we need to talk about that before the bill comes to the Floor.

Chairman GORDON. Thank you, Dr. Bartlett.

And Ms. Fudge is recognized.

Ms. FUDGE. Thank you, Mr. Chairman.

Mr. Chairman, I would like to voice my support for the Partnerships for Access to Laboratory Science pilot program. It is becoming more and more apparent how important these hands-on learning activities are for students. It is also no secret that high-need schools for the most part have insufficient tools to meet curricular demands.

In 2002, almost 60 percent of teachers in Washington, D.C., and in Chicago, Illinois, reported that the science labs in their schools were somewhat or very inadequate to meet curricular standards or that they had no science labs at all. Access to laboratory equipment is essential in recruiting and retaining students in STEM fields.

According to a report from the U.S. General Accounting Office in 2005, researchers found that approximately 40 percent of those college students who left the science fields reported some problem related to high school science preparation. Dr. Ehlers and I have introduced a resolution supporting the ideals of National Lab Day, an initiative that calls for businesses and professional volunteers to partner with schools to give students exposure to the STEM fields and hands-on experiences with STEM activities.

I know that my colleagues across the aisle believe in the importance of lab experiences, which is why I don't understand why they do not want to authorize the PALS [Partnerships for Access to Laboratory Science] program. Please oppose this amendment, and I thank you and I yield back, Mr. Chairman.

[The prepared statement of Ms. Fudge follows:]

PREPARED STATEMENT OF REPRESENTATIVE MARCIA L. FUDGE

Mr. Chairman, I would like to voice my support for the Partnerships for Access to Laboratory Science pilot program. It is becoming more and more apparent how important these hands-on learning activities are for students. It is also no secret that high-needs schools, for the most part, have insufficient tools to meet curricula demands. In 2002, almost 60% of teachers in Washington, DC and Chicago, IL, reported that the science labs in their school were somewhat or very inadequate to meet curricula standards, or that they had no science labs at all. Access to laboratory equipment is essential in recruiting and retaining students in STEM fields. According to a report from the U.S. General Accounting Office in 2005, researchers found that approximately 40 percent of those college students who left the science fields reported some problems related to high school science preparation.

Dr. Ehlers and I have introduced a resolution supporting the ideals (A National Lab Day, an initiative that calls for businesses and professional volunteers-to partner with schools to give students exposure to the STEM fields and hands-on experi-

ences with STEM activities. I know that my colleagues across the aisle believe in the importance of lab experiences, which is why I don't understand why they do not want to authorize the PALS program.

Please oppose this amendment. Thank you.

[The prepared statement of Mr. Costello follows:]

PREPARED STATEMENT OF REPRESENTATIVE JERRY F. COSTELLO

Good morning. Thank you, Mr. Chairman, for holding today's mark-up of H.R. 5116, the Reauthorization of the America COMPETES Act of 2010.

In the three years since the America COMPETES Act was signed into law, we have made great strides in innovation, education, and technology. I applaud the work of Chairman Gordon in drafting this reauthorization bill to invest in research, development, and innovation across the federal government and to maintain and encourage a highly-skilled, competitive workforce for generations to come.

As a member of the Congressional Manufacturing Caucus, I am especially pleased to see the targeted investments H.R. 5116 will make in the manufacturing sector to support innovation. The National Science Foundation (NSF) manufacturing research grant program created by this bill will develop new technologies and processes to make our manufacturing sector more efficient and productive in the future. Further, the bill provides new opportunities for small and medium sized manufacturers; the innovative services initiative at the Manufacturing Extension Partnership (MEP) Centers, which will reduce energy use and accelerate commercialization of new products, and the newly-created Office of Innovation and Entrepreneurship, which provides loan guarantees and regional hubs to ensure these smaller manufacturers can expand and improve their operations. These new programs will keep our manufacturers and our workforce competitive.

In addition, I recognize the important science, technology, engineering, and math (STEM) education programs included in H.R. 5116 to support undergraduate, graduate, and post-doctoral research and training, especially at the Department of Energy (DOE). This bill will ensure that DOE's STEM education programs mirror the important research being conducted by the agency on a wide variety of energy sciences.

In particular, I am pleased clarifying language in the manager's amendment will specifically include carbon capture and sequestration (CCS) science as an eligible STEM education program within DOE. CCS represents the future of coal-powered energy, the nation's most abundant and affordable energy source. The President's Fiscal Year 2011 budget invests over \$400 million in CCS research at DOE, and universities such as the Southern Illinois University-Carbondale engage in cutting-edge clean coal research. Including CCS in DOE's STEM education programming will ensure we continue to expand research, development, and deployment of this important technology and train a new generation of CCS scientists.

Finally, since coming to Congress, I have been a strong supporter of STEM education at every age from pre-school through adult education. I believe we must invest at every level to ensure we prepare the next generation of scientists and engineers and maintain the most innovative, competitive workforce in the world. As a member of the House Community Colleges Caucus, I am especially pleased to see that H.R. 5116 supports STEM education programs at community colleges and 2-year institutions. This legislation links community colleges with MEPs, other institutions of higher education, research institutions, and regional innovation hubs to ensure that students, workers, and researchers benefit from the unique perspective of community colleges.

However, investment in STEM education is especially important at the K-12 level, when students are first exposed to STEM curricula. The federal government should develop new ways to engage K-12 students in STEM and retain their interest through post-secondary education and in the workforce. Yet the K-12 STEM education initiatives authorized under COMPETES in 2007 have been removed from H.R. 5116. It is my hope that teacher retraining and K-12 STEM education provisions will be reauthorized, and I look forward to working with my colleagues to achieve this goal.

Thank you again, Mr. Chairman.

Chairman GORDON. Mr. Luján is recognized.

Mr. LUJÁN. Thank you very much, Mr. Chairman, and just to emphasize my support as well with the PALS program, Mr. Chairman. We also have the National Research Council, who looked at

this issue across the country back in 2005 as well, a study which looked at the role laboratory learning can have for the country's high school students and the current situation of laboratory learning, and we continue to see how there is problem after problem with the lack of access, Mr. Chairman. The NRC [National Research Council] report found that laboratory science programs in high school classrooms are in disarray and certain factors seriously hamper efforts to improve them. In particular, the National Academies' report that was highlighted earlier as well found that the vast majority of laboratory science programs in high school classrooms are also in disarray, so this is consistent information of two different groups that have looked at this, Mr. Chairman, and while this program hasn't received funding within the last three years, there is still a great need to further examine the role that laboratory experiences can play in improving STEM education at the high school level, and especially all the emphasis that we have in STEM [science, technology, engineering, and mathematics], Mr. Chairman, it seems to me that we should be looking at supporting programs and expanding them as opposed to pulling away at a time when students are at the most need around the country.

Thank you, Mr. Chairman. I yield back my time.

Chairman GORDON. Thank you, Mr. Luján.

Dr. Bartlett.

Mr. BARTLETT. Mr. Chairman, keeping this in the bill when the National Science Foundation says they are not going to fund it does not meet the objectives of these two speakers. If in fact we think that they are in error and they ought to fund it, then we need to amend the bill so that we require them to fund it. Just keeping it in there, you know, doesn't do anything if their intent is not to fund it. So I will withdraw my amendment and ask that we work together between now and when it comes to the Floor to determine whether or not this committee thinks that they are in error and that they should support this. We need to come to one of two conclusions: either they are wrong and we are going to require them to support it or they are right in not supporting and therefore are going to remove the language from the bill.

Chairman GORDON. As usual, Dr. Bartlett is very logical, and so this conversation will continue and the amendment is withdrawn. And we will then move to the next amendment on the roster, which is offered by the gentleman from Oregon, Mr. Wu. Are you ready to proceed with your amendment?

Mr. WU. I am, Mr. Chairman.

Chairman GORDON. The clerk will report the amendment.

The CLERK. Amendment 041, amendment to the amendment in the nature of a substitute offered by Mr. Wu of Oregon.

Chairman GORDON. I ask unanimous consent to dispense with the reading. Without objection, so ordered.

I recognize the gentleman for five minutes to explain his amendment.

Mr. WU. Thank you very much, Mr. Chairman.

My amendment improves American students' competitiveness in this very difficult job market through expanded internship opportunities for undergraduate students and potentially high school students in the private sector—for internships with private sector

STEM employers. Internships have a strong track record of preparing students for careers, and they are a particularly valuable tool for students in STEM fields.

According to the National Association of College and Employers, companies extended job offers to 70 percent of their interns in 2008. One reason why college graduates with internship experience are so much more competitive in the job market is that there is a significant skills gap between what is needed to complete an undergraduate degree in a STEM field and the skills needed for success in a STEM career. Even in the current economic climate, many high-tech companies report that they are unable to fill open positions because the college graduates applying for them lack the skills needed for success.

My amendment today will help bridge the knowledge gap that prevents some STEM graduates from getting jobs in the science and technology workforce by creating internship opportunities that can be integrated with students' STEM coursework. The amendment expands upon grant opportunities at the National Science Foundation for universities and stakeholder consortia to establish or expand partnerships with local or regional private sector organizations for the purpose of providing undergraduate students with integrated internship experiences.

My amendment also provides incentives to encourage universities and stakeholder consortia to coordinate with local and regional private sector entities in developing academic courses so that students will have the skills necessary for employment in companies in their community and in their region. It does so by helping universities and their partners identify areas where students need more instruction prior to graduation and providing specific coursework that prepares students for jobs in their respective fields immediately upon graduation.

In addition, my amendment requires NSF to report to Congress on its implementation of these grants, including their effect on workforce preparation and job placement for participating students.

Mr. Chairman, we focused on this amendment. I developed this amendment in part because of the job needs, the employment needs of Americans today in this very, very difficult environment, but also specifically because I have visited several employers in Oregon which are sponsoring internships which are doing a great job of training young people both high school students and college students for future employment in STEM fields, and these employers are seeking some additional assistance and encouragement in order to expand the programs they already have and to encourage fellow employers to develop such programs. And I believe that this is an important source of future STEM employees and part of the solution for the unemployment problems that we have, and I believe that we have a strong responsibility to address the Nation's rising—

Mr. ROHRABACHER. Would the gentleman—

Mr. WU. —need for STEM professionals—

Mr. ROHRABACHER. —yield for a question.

Mr. WU. —and I urge the Committee's support, and I would be happy to yield to the gentleman.

Mr. ROHRABACHER. How would this actually encourage more internships?

Mr. WU. The employers that I have spoken with say that they need some material support and also some support for program and curricula so that they can expand the program that they have already have, or the programs that they already have, and also encourage fellow employers to ramp up such programs with lower development costs, and charging the NSF or expanding on NSF activities where they are currently doing some of these activities would support, in essence, some of the overhead costs that these programs currently bear.

Mr. ROHRABACHER. Would this actually provide funds for companies that are then engaged, or companies who are actually government entities that are providing more of these intern opportunities?

Mr. WU. The funding is for the National Science Foundation and for the consortia. There is the potential for funding—for transferring some of the funding to the companies with internships. However, I believe that minority counsel raised an issue with direct funding of stipends, and that is to be resolved.

Mr. ROHRABACHER. But that is not in the current—your amendment that—

Mr. WU. I do not believe so.

Mr. ROHRABACHER. Thank you very much.

Chairman GORDON. Thank you, Mr. Wu, for your good jobs amendment and now if there is no further discussion—

Mr. BAIRD. Mr. Chairman.

Chairman GORDON. Oh, Dr. Baird.

Mr. BAIRD. I just want to very briefly but effusively praise my colleague. In my discipline in the social sciences, internships are an absolutely essential part of our training, and modestly, I just completed the 6th edition of my textbook on internships, but we tend to do that in the social sciences. We tend not to do it in some of the STEM fields, and I think he is right on the money about the educational value of this and I urge passage of this.

Chairman GORDON. If there is no further discussion—

Mr. BARTLETT. Mr. Chairman.

Chairman GORDON. —Mr. Bartlett has a second-degree amendment.

Mr. BARTLETT. Mr. Chairman, I have an amendment at the desk.

Chairman GORDON. The clerk will report the amendment.

The CLERK. Amendment 023, amendment offered by Bartlett of Maryland to the amendment offered by Mr. Wu of Oregon.

Chairman GORDON. I ask unanimous consent to dispense with the reading. Without objection, so ordered.

I recognize the gentleman for five minutes to explain his amendment.

Mr. BARTLETT. Mr. Chairman, I am a huge fan of internships. They are in effect willing slave labor. They work so hard and do much, and so I want to encourage that.

I have a second-degree amendment which I think that Mr. Wu has accepted. I am very pleased at that. But I will tell you that I am not happy where we are at the present moment so I hope that

we will work together between now and when the bill comes to the Floor.

You know, I am reluctant to exclude funding for internships at businesses. I am very concerned that a huge percentage of all the research support in this country comes from the Federal Government. The Federal Government can be very arbitrary and capricious, and my wish would be for us to take less money from the private sector so they had more money to invest in basic research, and my hope is that there will be some basic research going on in companies where—I would hope that there might be a company which is doing better basic research than anybody supported with government funds, so that is where we would want to send an intern. So I would like to look at language in the final bill that does not completely write off internships for businesses.

This amendment I think is a very simple amendment that addresses some of the problems that we have. By the way, if you are going to deny funding to any private sector partner, does that mean that the only universities that will get money are those run by government? I don't think that was our intent. So I would like to work together to refine the language of this bill before it comes to the Floor.

Mr. WU. Will the gentleman yield?

Mr. BARTLETT. Yes, sir.

Mr. WU. I welcome the gentleman's amendment. I think it moves us in the right direction.

Mr. BARTLETT. Thank you, sir.

Thank you, Mr. Chairman.

Chairman GORDON. If there is no further discussion on the amendment, Mr. Bartlett's amendment, the vote occurs on the amendment. All in favor, say aye. Opposed, no. The ayes have it.

Now the vote occurs on Mr. Wu's amendment. All in favor, say aye. Those opposed, no. The ayes have it and the amendment is agreed upon.

The next amendment on the roster is an amendment offered by the gentleman from New Mexico, Mr. Luján. Are you ready to proceed with your amendment?

Mr. LUJÁN. Thank you, Mr. Chairman. I have an amendment at the desk.

Chairman GORDON. The clerk will report the amendment.

The CLERK. Amendment 049, amendment to the amendment in the nature of a substitute offered by Mr. Luján of New Mexico.

Chairman GORDON. I ask unanimous consent to dispense with the reading. Without objection, so ordered.

I recognize the gentleman for five minutes to explain his amendment.

Mr. LUJÁN. Thank you, Mr. Chairman and Ranking Member Hall, and thank you for your hard work on this bill. I would also like to thank the Chairman for including language in this bill that requires the Director of the National Science Foundation to develop a plan for clarifying the objectives and rationale behind the proposal to consolidate NSF's minority-serving institution programs, including the Hispanic-serving institution undergraduate program required by section 7033 of the *America COMPETES Act of 2007*. While I have serious concerns about this proposal, I am encouraged

by NSF's willingness to address these concerns over the next several months.

My amendment today codifies the Tribal Colleges and University Program, otherwise known as TCUP, at the National Science Foundation. This program awards grants to tribal colleges and universities to enhance the quality of undergraduate science, technology, engineering and mathematics and to increase the retention and graduation rates of Native American students pursuing degrees in STEM fields. These grants will support activities to improve courses and curriculum as well as faculty development. New Mexico alone is home to over 22 different tribes, 17 of which are located in my district, including three tribal colleges and universities. These educational institutions are designed to support the unique learning needs of our Native American students who continue to be underrepresented in STEM fields.

With that, Mr. Chairman, I urge the adoption of this amendment and thank my colleagues for their time today. We must invest in comprehensive, collaborative approaches to strengthen STEM teaching and learning in ways that improve access to retention within, and graduation from STEM programs is imperative and that we prepare our students for the jobs of the future. Unfortunately, there has been a divide for too long that has kept minority students out of these fields.

With that, Mr. Chairman, I appreciate your time today and again urge adoption. Yield back my time.

Chairman GORDON. Thank you, Mr. Luján, for this good amendment. It is consistent with the testimony that this committee has received and recommendations that have been sent to this committee.

Is there further discussion? If no, the vote occurs on the amendment. All in favor, say aye. Opposed, say no. The ayes have it and the amendment is agreed to.

The next amendment on the roster is an amendment offered by the gentleman from Florida, Mr. Diaz-Balart. Are you ready to proceed with your amendment?

Mr. DIAZ-BALART. Mr. Chairman, this is the amendment that I had spoken about. We can withdraw now. I ask for unanimous consent to withdraw the amendment.

Chairman GORDON. Thank you very much.

Now the next amendment on the roster is offered by the gentleman from Texas, Mr. McCaul. Are you ready to proceed with your amendment?

Mr. MCCAUL. I am, Mr. Chairman. I have an amendment at the desk.

Chairman GORDON. The clerk will report the amendment.

The CLERK. Amendment 034, amendment to the amendment in the nature of a substitute offered by Mr. McCaul of Texas.

Chairman GORDON. I ask unanimous consent to dispense with the reading. Without objection, so ordered.

I recognize the gentleman for five minutes to explain his amendment.

Mr. MCCAUL. Thank you, Mr. Chairman.

As you know, this amendment passes a bill earlier unanimously by this committee and passed the House floor. The *Green Energy*

Education Act will help train the next generation of architects and engineers in our universities to build greater energy-efficient buildings, and I urge support for this once again, and I also want to thank the Chairman for the idea of bringing this up once again under the COMPETES Act as another vehicle to hopefully pass this important legislation, and with that, I yield back.

Chairman GORDON. Thank you, Mr. McCaul. As they say, try, try, try again. This is an excellent amendment, and I am glad that there was a vehicle for it. I feel confident that this will finally be implemented and it will be good public policy and something that will be a small part of your bigger legacy.

If there further discussion on the amendment? If no, the vote occurs on the amendment. All in favor, say aye. Opposed, no. The ayes have it and the amendment passes.

The next amendment on the roster is an amendment offered by the gentleman from Texas, Mr. Hall. Are you ready to proceed with your amendment?

Mr. HALL. I am. I have an amendment at the desk.

Chairman GORDON. The clerk will report the amendment.

The CLERK. Amendment 278, amendment to the amendment in the nature of a substitute to H.R. 5116 offered by Mr. Hall of Texas.

Chairman GORDON. I ask unanimous consent to dispense with the reading. Without objection, so ordered.

I recognize the gentleman for five minutes to explain his amendment.

Mr. HALL. Mr. Chairman, this amendment simply modifies the mission of the Engineering Laboratory at the National Institute of Standards and Technology. We had reached an agreement on mission language for this lab prior to the filing of the manager's amendment. I don't want to start the chain. Roscoe is not here but I don't want to start the chain again on the manager's amendment, but somehow it wasn't incorporated with all the moving parts of the markup process.

This amendment is the simplest way to handle this oversight, I think, and I understand it will probably be accepted, and as always, we are willing to work with you on any clarifying language necessary in the manager's amendment.

Chairman GORDON. Mr. Hall, thank you for this good amendment. Sorry that it was not incorporated but it just gives you an opportunity to once again talk about what good merits it has.

Is there any further discussion on the amendment? If no, then all those in favor of the amendment say aye. Opposed, no. The ayes have it and the amendment is agreed to.

The next amendment on the roster is an amendment offered by the gentleman from Georgia, Dr. Broun. Are you ready to proceed with your amendment?

Mr. BROUN. Yes, Mr. Chairman. I have an amendment at the desk.

Chairman GORDON. The clerk will report the amendment.

The CLERK. Amendment number 279, amendment to the amendment in the nature of a substitute to H.R. 5116 offered by Mr. Broun of Georgia.

Chairman GORDON. I ask unanimous consent to dispense with the reading. Without objection, so ordered.

I recognize the gentleman for five minutes to explain his amendment.

Mr. BROUN. Thank you, Mr. Chairman.

The amendment would help our Committee eliminate redundancy and help reduce the cost of new programs that the Title V, Innovation, creates by striking the entire title altogether from this COMPETES reauthorization. The federal loan guarantees Title V creates are similar to those that other agencies such as the Small Business Administration [SBA] and U.S. Department of Agriculture [USDA] offer to small businesses including manufacturing businesses. Creating a new program at the Department of Commerce to back the same kind of loans would simply shift the loan guarantee funding burdens away from SBA and USDA to the Department of Commerce.

Why would our Committee want to duplicate what other agencies are already administering? These loan guarantee programs are highly complex and require significant administrative effort to properly manage them. The effect would be to reduce resources available for the Department of Commerce to engage in its constitutional activities such as NIST developing the Nation's standards of weights and measures.

The Regional Innovation Clusters Program also presents problems which call for their elimination. The main goal of this program is not on research and development but to facilitate market development of products and services, which sounds to me like marketing and advertising. Certainly these are goals that our Committee should not support.

Also, as in the case with the loan guarantee program, the language is so broad that one could interpret that our Committee is authorizing funding for anything that the Department of Commerce wants. The definition of "regional innovation cluster" makes no mention of technology development. Rather, it is a group of entities within a "particular industry sector" that "have active channels for business transactions and communication" and "share specialized infrastructure, labor, markets and services." Under this definition, Commerce could support a cluster for anything from textile manufacturing to honeybee farming—you name it. Technically, based on this current definition, I don't see how any industry sector would be excluded from the program's eligibility.

Finally, codifying the Office of Innovation and Entrepreneurship in section 501 of Title V is simply not necessary. The office already exists. Additionally, the bill language directs the office to "advocate policies." It is directing the Department of Commerce to "advocate" an appropriate executive branch activity. Is it? It seems to be. At a time when we are experiencing over trillion dollar deficits, it just makes sense to hold off on starting new programs which are duplicative to existing programs and that will cost \$250 million over five years for the loan guarantee program and such mercurial, such sums, as it is stated in the bill, amount for the clusters program.

I urge the Committee to support this amendment that eliminates the Title V, Innovation, so that we can help our country get back

on a more solid financial ground. Our children and our grandchildren depend upon it.

Thank you, Mr. Chairman. I yield back.

Chairman GORDON. Thank you, Dr. Broun, and again, I respect your sincerity and your consistency here, although it is a very broad amendment, striking the entire Title V, which I think has a number of good programs. I want to answer one thing that you did bring up is, in the Department of Commerce, they have already established this Office of Innovation and Entrepreneurship. The reason that we are authorizing it is so we can have authority for oversight. We wouldn't have authority otherwise. So I think that way you can keep an eye on them. Is there further discussion—

Mr. BROUN. Will the Chairman yield?

Chairman GORDON. Yes.

Mr. BROUN. If this amendment does not succeed, which I expect it won't, just bearing the nature of what the amendment is all about, but could we—of course, I hope it does succeed because I think it makes sense. We have just got to stop the spending here in Congress, and this is creating new programs, new offices, new bureaucracy, new federal employees, and we have just got to stop the spending or halt the growth of government, and it is just critical.

Would you accept my amendment if we could work together just to have the oversight of that already existing agency?

Chairman GORDON. You know, I am afraid I couldn't, Dr. Broun, because this is knocking out the entire Title V, and I think there are a variety of good proposals there, so I regret to say that I could not do that.

Mr. BROUN. Would the Chairman yield?

Chairman GORDON. If he still has some time, yes.

Mr. BROUN. Thank you, Mr. Chairman. The point is, in Title V these are duplicative programs. We already have the facility to do these things without having Title V, and that is the only reason to take that out. It is a big slash, I agree, but we need to be slashing government instead of growing government, and that is my whole purpose of this. We have got to stop the growth of government. We have got to stop the spending here in Washington, D.C. That is the purpose so that is the reason I bring forth this amendment, and I think it just makes sense. Our American people are demanding less government, and I hope that Members of the Committee will support this amendment. Thank you, Mr. Chairman.

Chairman GORDON. Thank you, Dr. Broun. It is really more of a coordination rather than duplication that was the reason for that, but I think Mr. Luján wanted to be recognized.

Mr. LUJÁN. Thank you, Mr. Chairman, and while I appreciate the sentiments of making sure that we are being fiscally responsible by looking at programs, Mr. Chairman, I think that we also have to take into consideration the importance of how we can push technology out. As we look at evaluations that have come out of GAO [Government Accountability Office], out of Sandia National Laboratories, out of the Department of Energy and even other labs that have been interviewed, Mr. Chairman, we continue to hear that the lack of ability where we can encourage programs to bring people together either through innovation hubs or through clusters,

as we look at the innovation section of this legislation to accelerate commercialization, manufacturing, areas where these ideas will be modeled after Bell Labs, the Manhattan Project labs and bioenergy research centers, I truly hope that these are ideas that we can look and work together where I know that they have been supported by both sides of the aisle, and I know that Ranking Member Hall is fond of a former Member from New Mexico, Manuel Luján, that also served on this committee and served as its Ranking Member who adopted and really supported and encouraged what we should be doing to look to support this side of activity as well, Mr. Chairman.

So again, I just want to hope that we don't lose sight that we can help and accelerate these sides, and I yield back my time.

Chairman GORDON. Does anyone else wish to be recognized? Mr. Carnahan is recognized.

Mr. CARNAHAN. Thank you, Mr. Chairman. Real briefly, I had heard specifically from our Missouri Enterprise program that serves the St. Louis region and much of Missouri that asked me to speak up on this amendment because they believe that the innovation section truly enhances the competitive grant program that has been authorized. It adds another theme, reduction of energy usage and environmental waste to improve profitability and accelerate domestic commercialization of new product technologies to be considered by NIST and MEP [Manufacturing Extension Partnership] when offering these competitive grants, and then in addition the market demand analysis section will require NIST and MEP to verify that any product or service they require the centers to offer will be one that is relevant and needed by small and medium-sized manufacturing clients which are certainly key in our region and therefore I would ask our colleagues respectfully to oppose the amendment.

Chairman GORDON. Mr. Wu is recognized.

Mr. WU. Thank you very much.

I very much respect Mr. Broun's passion and consistency on this set of issues but with all due respect, I must with equal passion and fervor disagree and urge rejection of this amendment because it is precisely this battle for the future and this battle for economic growth and in essence creating seed corn for future economic growth that creation of this section and this innovation agenda and lodging it at NIST, that is what this is all about. Let there be no mistake: The role of innovation in our society and our economy is absolutely essential. The vast majority of economists agree that more than 50 percent of American economic growth since World War II is the result of innovation, not more labor, not more materials, but the way that labor and materials are blended together to produce products and services and jobs. Solow got a Nobel Prize for determining that from the 1890s to mid-century, 90 percent of American economic growth was because of innovation and innovative ideas. It is not just the creation of a lot of jobs from innovation but it is precisely because it also creates high-wage middle-class jobs, which we sorely need today, and centralizing some of these innovation ideas at NIST is entirely appropriate. NIST is a non-regulatory body. It is highly popular with the private sector. It has done a good job with the many other things that have been assigned to

it, as Mr. Broun cited, in its standards work, and it has thus far done a good piecemeal in innovation and this section permits NIST to rationalize that process and bring the innovation agenda into focus in one place.

We are here creating the seed corn for future economic growth. There is a lot of room to cut in the federal budget but I submit to you that this is precisely the wrong place to cut it. I yield back the balance of my time.

Chairman GORDON. Mr. Rohrabacher is recognized.

Mr. ROHRABACHER. Mr. Chairman, Mr. Broun is right and this is duplicative. We should not be spending money that is already being—that some other agencies and departments already have the responsibility. Duplication is a waste of money. I support Mr. Broun's amendment and would yield my time to him.

Mr. BROUN. I thank you, Mr. Rohrabacher, for yielding me some time.

I don't understand. I hear from our colleagues on the other side that we need innovation, and I agree. I am not surprised that Mr. Luján and Mr. Wu oppose the amendment but I think most Members of this committee understand that I believe in the Constitution as it was originally intended and think that we should only be doing the 18 things that Article I, section 8 gives us the authority to do and no more. That is what our Founding Fathers meant. NIST is one of those things that is truly constitutional. I am a strong supporter of NIST and I am a strong supporter of a very aggressive NIST as well as I am a strong supporter of research and development and scientific inquiry and all those things.

But I don't understand how eliminating Title V is going to decrease innovation, how it is going to stop any promotion or advertising, and if the Chairman or the Subcommittee Chairman, I would like to ask one or both of you to please explain to me how eliminating Title V would inhibit innovation, how it would inhibit the promotion or advertising. I just don't understand how that would happen. So I would yield to either or both for that answer.

Chairman GORDON. Would you also yield to Mr. Peters? I think he would like to—

Mr. BROUN. Well, anybody who can answer how eliminating Title V, which is totally duplicative to other functions of the Federal Government. We already have these things in place. Why add another one? I would like to hear somebody answer me, and I will be glad to yield to anybody who can answer me.

Chairman GORDON. Mr. Peters is recognized.

Mr. PETERS. Well, thank you, Mr. Chairman. It is not directly to the question Mr. Broun is asking but what happens with the elimination of Title V. There is a critical component of it that I am very concerned about, and that is the elimination of the federal loan guarantees for manufacturing. As a person who represents an awful lot of manufacturing companies, it is probably the number one problem right now that manufacturers are facing because of the credit crisis that we are in, that they are not able to get the lending that they need in order to expand their manufacturing to move forward. As their collateral has dropped, they are finding that the commercial banks are simply not lending to them. They

are in a position right now where they can create jobs right now, and yet they cannot get the liquidity necessary to go forward.

It was certainly one of the number one items brought forward to us by the National Association of Manufacturers. NAM testified to this component of it. In fact, it was Governor Engler, the former governor of my state, that was very strong in his testimony that federal loan guarantees are essential to manufacturing right now and essential to American competitiveness and see this as a major problem with this amendment.

Mr. BROUN. I need to reclaim my time.

Mr. ROHRABACHER. Actually, Mr. Chairman, I think I have the time.

Chairman GORDON. Mr. Rohrabacher.

Mr. ROHRABACHER. If it is duplicative, it is duplicative. If there are other loan guarantee areas in the Federal Government, various departments and agencies, that is a major question that needs to be addressed, not just the validity of helping our manufacturers through loan guarantees, and I would then again yield back the one minute that I have left to Mr. Broun.

Mr. BROUN. Well, thank you, Mr. Rohrabacher.

I agree that manufacturing has some problems but we already have, as Mr. Rohrabacher said, as I said in my statement, we already have these programs. They are duplicative. Your manufacturing base can already get loans through SBA and through other entities. We have got to get the pressure off the small community banks so that they can lend money to small business and to manufacturing entities and the Federal Government is busily closing small banks and is not able to loan money to your manufacturing entities as well as other small businesses. These programs are duplicative. They are totally unneeded and that is the reason that I brought forth this amendment, and I think a vote for this is just a vote for growing the size of government and spending more money that we don't have, and so I hope that you all will reconsider. Let us stop these duplicative programs. Let us stop this language that is just so vague that anything could fit, and I encourage adoption of my amendment. I yield back. Thank you.

Chairman GORDON. The Chairman yields to himself.

Dr. Broun raises legitimate questions but I think they are off point in this. Yes, Mr. Rohrabacher, there are additional types of loan guarantee programs and bonding programs elsewhere but they are for different purposes, and this one is specific, and so I want to read to you on page 70 under the coordination and non-duplication section. It says, "Coordination and non-duplication. To the maximum extent practicable, the Secretary shall ensure that the activities carried out under this section are coordinated with and do not duplicate the efforts of other loan guarantee programs within the Federal Government." So yes, SBA has some loan guarantee programs but they wouldn't be for these types of manufacturers. So, again, I sincerely hope that your concerns have been addressed by virtue of this, and I yield to you.

Mr. BROUN. Thank you, Chairman. I appreciate that. But what is to prevent them from duplicating it? Because I see very little coordination within the Federal Government from one agency to another on anything. So—

Chairman GORDON. If I could regain—

Mr. BROUN. Yes, sir.

Chairman GORDON. That is the mandate. They are mandating not to duplicate. So it is our Committee's responsibility in oversight to make sure that occurs.

Mr. BROUN. Well, I appreciate the Chairman.

Chairman GORDON. And I yield back.

Mr. BROUN. Thank you. I appreciate it.

I hope we will do that, but frankly, I have very little confidence in this Federal Government. I have very little confidence in one agency working with another to try to prevent duplication of any services because we have never seen that happen, to my knowledge, and it is—because each department, each agency wants to grow itself as much as possible so I hope that this committee in the Chairman's absence in the future—and I also likewise have enjoyed serving with the Chairman and I am going to miss you personally as a friend, but I hope whoever is running this committee, hopefully it is going to be Mr. Hall in the next Congress, but hopefully we will keep their feet to the fire and not have duplication. I thank you, Chairman, for yielding.

Mr. BAIRD. Mr. Chairman, would you please take away the gentleman's pizza for that remark?

Chairman GORDON. Let me just say that Mr. Hall is very flexible so he may be Chairman of this committee in the future. You never know.

Dr. Broun, I am going to make you a present of this section here, so you will have it. Part of this committee's responsibility next year should be oversight, and you can show where to go.

So if there is no further discussion, the vote is on the amendment. All in favor, say aye. Opposed, no. The no's have it. The amendment is not agreed to. Yes, Dr. Broun?

Mr. BROUN. I request a recorded vote, please, sir.

Chairman GORDON. A recorded vote is requested, and the clerk will call the roll.

The CLERK. Chairman Gordon?

Chairman GORDON. No.

The CLERK. Chairman Gordon votes no. Mr. Costello?

[No response.]

The CLERK. Ms. Johnson?

Ms. JOHNSON. No.

The CLERK. Ms. Johnson votes no. Ms. Woolsey?

[No response.]

The CLERK. Mr. Wu?

Mr. WU. No.

The CLERK. Mr. Wu votes no. Mr. Baird?

Mr. BAIRD. No.

The CLERK. Mr. Baird votes no. Mr. Miller?

Mr. MILLER. No.

The CLERK. Mr. Miller votes no. Mr. Lipinski?

Mr. LIPINSKI. No.

The CLERK. Mr. Lipinski votes no. Ms. Giffords?

[No response.]

The CLERK. Ms. Edwards?

Ms. EDWARDS. No.

The CLERK. Ms. Edwards votes no. Ms. Fudge?
Ms. FUDGE. No.
The CLERK. Ms. Fudge votes no. Mr. Luján?
Mr. LUJÁN. No.
The CLERK. Mr. Luján votes no. Mr. Tonko?
Mr. TONKO. No.
The CLERK. Mr. Tonko votes no. Mr. Garamendi?
Mr. GARAMENDI. No.
The CLERK. Mr. Garamendi votes no. Mr. Rothman?
[No response.]
The CLERK. Mr. Matheson?
Mr. MATHESON. No.
The CLERK. Mr. Matheson votes no. Mr. Chandler?
Mr. CHANDLER. No.
The CLERK. Mr. Chandler votes no. Mr. Davis?
Mr. DAVIS. No.
The CLERK. Mr. Davis votes no. Mr. Carnahan?
Mr. CARNAHAN. No.
The CLERK. Mr. Carnahan votes no. Mr. Hill?
Mr. HILL. No.
The CLERK. Mr. Hill votes no. Mr. Mitchell?
Mr. MITCHELL. No.
The CLERK. Mr. Mitchell votes no. Mr. Wilson?
Mr. WILSON. No.
The CLERK. Mr. Wilson votes no. Mrs. Dahlkemper?
Mrs. DAHLKEMPER. No.
The CLERK. Mrs. Dahlkemper votes no. Mr. Grayson?
Mr. GRAYSON. No.
The CLERK. Mr. Grayson votes no. Ms. Kosmas?
Ms. KOSMAS. No.
The CLERK. Ms. Kosmas votes no. Mr. Peters?
Mr. PETERS. No.
The CLERK. Mr. Peters votes no. Mr. Hall?
Mr. HALL. Aye.
The CLERK. Mr. Hall votes aye. Mr. Sensenbrenner?
[No response.]
The CLERK. Mr. Lamar Smith?
[No response.]
The CLERK. Mr. Rohrabacher?
Mr. ROHRABACHER. Yes.
The CLERK. Mr. Rohrabacher votes aye. Mr. Bartlett?
[No response.]
The CLERK. Mr. Ehlers?
[No response.]
The CLERK. Mr. Lucas?
[No response.]
The CLERK. Mrs. Biggert?
Mrs. BIGGERT. No.
The CLERK. Mrs. Biggert votes no. Mr. Akin?
Mr. AKIN. Aye.
The CLERK. Mr. Akin votes aye. Mr. Neugebauer?
[No response.]
The CLERK. Mr. Inglis?
Mr. INGLIS. Aye.

The CLERK. Mr. Inglis votes aye. Mr. McCaul?

[No response.]

The CLERK. Mr. Diaz-Balart?

Mr. DIAZ-BALART. Aye.

The CLERK. Mr. Diaz-Balart votes aye. Mr. Bilbray?

Mr. BILBRAY. Aye.

The CLERK. Mr. Bilbray votes aye. Mr. Adrian Smith?

Mr. SMITH OF NEBRASKA. Aye.

The CLERK. Mr. Adrian Smith votes aye. Mr. Broun?

Mr. BROUN. Aye.

The CLERK. Mr. Broun votes aye. Mr. Olson?

[No response.]

Mr. ROTHMAN. Mr. Chairman, I would like to be recorded as no, please.

Chairman GORDON. Thank you, Mr. Rothman.

The CLERK. Mr. Rothman votes no.

Ms. GIFFORDS. Mr. Chairman, I vote no.

The CLERK. Ms. Giffords is not recorded.

Ms. GIFFORDS. I vote no.

The CLERK. Ms. Giffords votes no.

Chairman GORDON. Anyone else that hasn't been recorded? If not, the clerk will report.

The CLERK. Mr. Chairman, eight Members vote aye and 25 Members vote no.

COMMITTEE ON SCIENCE AND TECHNOLOGY - 111th

DATE 4-28-10 AMENDMENT NO. 21 ROLL CALL NO. 3_
 Bill: H. R. 5116 - America COMPETES
 Reauthorization Act of 2010
 SPONSOR of AMEND - Mr. Broun 279

PASSED VOICE VOTE
 DEFEATED ✓ WITHDRAWN

Quorum - 15 to vote - 22 to report

MEMBER	AYE	NO	PRESENT	NOT VOTING
1 Mr. GORDON, Chair		✓		
2 Mr. COSTELLO - IL				
3 Ms. JOHNSON - TX		✓		
4 Ms. WOOLSEY - CA				
5 Mr. WU - OR		✓		
6 Mr. BAIRD - WA		✓		
7 Mr. MILLER - NC		✓		
8 Mr. LIPINSKI - IL		✓		
9 Ms. GIFFORDS - AZ		✓		
10 Ms. EDWARDS - MD		✓		
11 Ms. FUDGE - OH		✓		
12 Mr. LUJÁN - NM		✓		
13 Mr. TONKO - NY		✓		
14 Mr. GARAMENDI, CA		✓		
15 Mr. ROTHMAN - NJ		✓		
16 Mr. MATHESON - UT		✓		
17 Mr. DAVIS - TN		✓		
18 Mr. CHANDLER - KY		✓		
19 Mr. CARNAHAN - MD		✓		
20 Mr. HILL - IN		✓		
21 Mr. MITCHELL - AZ		✓		
22 Mr. WILSON - OH		✓		
23 Mrs. DAHLKEMPER- PA		✓		
24 Mr. GRAYSON - FL		✓		
25 Ms. KOSMAS - FL		✓		
26 Mr. PETERS - MI		✓		
27 Vacancy				
1 Mr. HALL- TX	✓			
2 Mr. SENSENBRENNER-WI				
3 Mr. LAMAR SMITH- TX				
4 Mr. ROHRABACHER- CA	✓			
5 Mr. BARTLETT- MD				
6 Mr. EHLERS- MI				
7 Mr. LUCAS- OK				
8 Mrs. BIGGERT- IL		✓		
9 Mr. AKIN- MO	✓			
10 Mr. NEUGEBAUER- TX				
11 Mr. INGLIS- SC	✓			
12 Mr. McCAUL- TX				
13 Mr. DIAZ-BALART- FL	✓			
14 Mr. BILBRAY- CA	✓			
15 Mr. ADRIAN SMITH- NE	✓			
16 Mr. BROUN - GA	✓			
17 Mr. OLSON- TX				
TOTALS	8	25		

Chairman GORDON. The amendment is not passed.

Before we move on to the next amendment, we are almost half-way through, and the Chairman has been asked for mercy, and so in respect to human beings here, we are going to take about a 20-minute break, which puts us back at 1:00, and everyone is invited to the Chairman's lounge for pizza and cold drinks.

Mr. BROUN. Mr. Chairman.

Chairman GORDON. Dr. Broun.

Mr. BROUN. Dr. Baird withdrew my pizza permit. I ask unanimous consent that it be reinstated.

Chairman GORDON. With unanimous consent, Dr. Broun is allocated one piece.

[Recess.]

Chairman GORDON. We will return to order, and the next amendment on the roster is an amendment offered by the gentleman from Michigan, Dr. Ehlers. Are you ready to proceed with your amendment?

Mr. EHLERS. I am ready. The amendment is at the desk.

Chairman GORDON. The clerk will report the amendment.

The CLERK. Amendment 284, amendment to the amendment in the nature of a substitute to H.R. 5116 offered by Mr. Ehlers of Michigan.

Chairman GORDON. I ask unanimous consent to dispense with the reading.

Without objection, so ordered.

I recognize the gentleman for five minutes to explain his amendment.

Mr. EHLERS. Thank you, Mr. Chairman. This is somewhat along the lines of the previous amendment offered by Dr. Broun but is targeted in a specific way, and it will simply require that the Loan Guarantee Program include among its eligibility criteria written evidence from potential purchasers that a market exists for the product for which the loan is requested.

Now, that may sound a little cumbersome, but when you analyze it, it is not cumbersome at all because the information I am suggesting that they have to provide is simply the—to show that there is a potential market demand for the proposed innovation.

The amount of information required is minimal, and in fact, anyone wishing to go into manufacturing and—or developing the innovation that they are seeking money for has to provide exactly the same information to a bank that would provide a portion of the funding, too.

So it would simply say that the Federal Government would be furnished with the same information that the bank would, and therefore, we don't impose any bad requirements or troublesome requirements but at the same time we get substantial evidence that they have done their homework before requesting the money and that there—this is likely to result in a market for the project or the program or manufacturing equipment that they are seeking to fund.

So I urge adoption of this amendment.

Chairman GORDON. Thank you, Dr. Ehlers. It is an excellent amendment and I think brings clarity to a good program.

Does anyone else wish to be recognized?

Mr. HALL. Mr. Chairman.

Chairman GORDON. Mr. Hall is recognized.

Mr. HALL. This is a good government amendment that simply insures that applicants for manufacturing loan guarantees demonstrate that there is a market for the products they are wanting to manufacture, and this will help protect taxpayer dollars from subsidizing products that don't have a reasonable chance to succeed in the marketplace.

I understand this language is modeled on similar provisions in other Loan Guarantee Programs. I urge the Members to support it.

Chairman GORDON. Is there further discussion?

If there is no further discussion, then the vote occurs on the amendment. All in favor, say aye. Opposed, no. The ayes have it. The amendment is agreed to.

The next amendment on the roster in an amendment offered by the gentleman from Maryland, Dr. Bartlett. Are you ready to proceed with your amendment?

Mr. BARTLETT. I am, sir. I have an amendment at the desk.

Chairman GORDON. The clerk will report the amendment.

The CLERK. Amendment 287, amendment to the amendment in the nature of a substitute to H.R. 5116 offered by Mr. Bartlett of Maryland.

Chairman GORDON. I ask unanimous consent to dispense with the reading.

Without objection, so ordered.

I recognize the gentleman for five minutes to explain his amendment.

Mr. BARTLETT. Thank you, Mr. Chairman. The program has a loan portion without any process on how to administer the loans, and this amendment simply incorporates the Office of Management and Budget Circular number A, 129, for administration of our loans.

Thank you, and I yield back.

Chairman GORDON. Thank you, Dr. Bartlett, and once again, another good clarifying amendment.

Mr. Hall is recognized.

Mr. HALL. Mr. Chairman, this is, as you say, another good government amendment. It simply requires the Department of Commerce to manage the Loan Guarantee Program consistent with the Office of Management and Budget's long-standing guidelines on programs like this.

This will minimize the program risk and help protect taxpayer dollars. As a part of an OMB directive, this should be expected of the agency, but Dr. Bartlett's amendment would solidify this by making it explicit in the law.

It is a good amendment, so I hope we support it.

Chairman GORDON. If there is no further discussion, then the vote is on the amendment. All in favor of the amendment, say aye. Opposed, no. The ayes have it. The amendment is agreed to.

The next amendment on the roster is an amendment offered by the gentleman from California, Mr. Bilbray.

Mr. BILBRAY. Yes, Mr. Chairman. I have an amendment at the desk.

Chairman GORDON. The clerk will report the amendment.

The CLERK. Amendment 290, amendment to the amendment in the nature of a substitute to H.R. 5116 offered by Mr. Bilbray of California.

Chairman GORDON. I ask unanimous consent to dispense with the reading.

Without objection, so ordered.

I recognize the gentleman for five minutes.

Mr. BILBRAY. Thank you, Mr. Chairman. Mr. Chairman, this is just a Sense of Congress that we keep the evolution that actually was started during the Clinton Administration, was carried on by the Bush Administration, and has now been aggressively implemented by the Obama Administration, and that is to make sure that wherever the taxpayers' funds and guarantees go, so goes, too, the assurance that only those legally present in the country will be hired under this program or under these auspices, and this really just is a Sense of Congress.

As I am proud to say, you were an original cosponsor of Mr. Shuler's bill that would have made this application universal and eliminated the need for these kind of amendments, but it is the Sense of Congress that as we implement these programs that have job opportunities in there, we make sure that we keep our commitment to the American people that their tax dollars are not being used to violate the federal law and e-verifies very simple. It is so simple that every Member of Congress uses it, so I guess that is prima facie evidence that anybody can use it.

And I just ask that we approve this as a Sense of Congress. The Administration, I am sure, will understand our intentions here and follow suit as they have just recently with requiring all contractors in the federal system to use e-verify.

And with that I yield back, Mr. Chairman.

Chairman GORDON. Thank you, Mr. Bilbray. As I had mentioned earlier, there were some potential concern about the small and medium-sized individuals. Mr. Smith, who has a lot of background in this, doesn't seem to think that will be a problem, but I don't oppose this amendment, and we will be discussing with you if there does seem to be an implementation problem with smaller people.

Does anyone else wish to be—Dr. Broun is recognized.

Mr. BROUN. Thank you, Mr. Chairman. I rise to speak for this amendment. I think it is common sense as Mr. Bilbray said. It is currently federal law that no one, including the Federal Government, should hire an illegal alien, should rent to or harbor an illegal alien in any manner.

Currently the only way we have of trying as an employer, even in the Federal Government, is to verify legal status of an individual is to utilize e-verify. I have a bill that I introduced in the last Congress called *Improve E-Verify*, that I think will strengthen that program, and so I am a strong proponent of e-verify.

I am very concerned as I just move around the capitol in the office buildings here, I speak to a number of folks who don't understand when I say in English, even with my Southern accent, I know that a lot of people from other parts of the country can't understand what I say either, but they answer in Spanish and say "no comprende," and I am very concerned that the Federal Government is hiring illegal aliens, and this is just a common sense

amendment that puts into—or codifies that these programs must utilize e-verify.

So I am a very strong supporter of this amendment. I hope the whole Committee will support it, and I yield back.

Chairman GORDON. If there—oh. Mr. Luján is recognized.

Mr. LUJÁN. Mr. Chairman, I just hope that as we look to make sure we are embracing diversity that speaking multiple languages is something that we embrace, Mr. Chairman, and something that I hope is encouraged. It is encouraged in my home state, my great state, and I think that as we engage in a global business, that is something that should be embraced and not discouraged, Mr. Chairman.

Mr. BROUN. Would the gentleman yield?

Mr. LUJÁN. I yield back my time.

Chairman GORDON. Mr. Luján, my daughter—we are talking about what language my daughter is going to take next fall, so you are absolutely correct. We will be a better country as we can reach out rather than just being reached to.

Mr. ROHRABACHER. Mr. Chairman, would you yield?

Chairman GORDON. Mr. Rohrabacher is recognized.

Mr. ROHRABACHER. Thank you. Just to clarify some matters. Very few people are concerned about illegal immigration or English as the official language. I don't know anybody who opposes the idea of having people be able to speak more than one language. That is obviously something that would be a great benefit and a great asset. The only objection that I have heard through the Democratic process and of our country is people raising the issue of whether or not we should do official business in another language, which would then discourage certain people from having—to taking the effort to learn English as a language, because that is their second language.

Every country that I know of that has had more than one official language has incredible problems because of it. You have separation of people rather than unity of people. So while I certainly agree with my colleague, Mr. Luján, that we should never discourage someone, and by the way, I speak enough Spanish to get by on, and I lived with a Mexican family in Mexico when I was younger, and I think it is a wonderful thing that the son of that household spoke English as well as Spanish and that I know a little Spanish to be able to function that way, too.

But in our country, just as Mexico needs Spanish as their language, we need English as our language to keep us together.

Mr. LUJÁN. Would the gentleman yield?

Mr. ROHRABACHER. One last point, and that is we now have seen a great deal of consternation over what has been going on in Arizona, and let us just hope that we can get control of his massive flow of illegals into our country and we—that we take the steps that are necessary to discourage that flow into our country by what Mr. Bilbray's amendment is all about. At least we are trying to make sure that the Federal Government—I don't think any company should be providing jobs that will encourage people to come across the border illegally. Otherwise we are going to be forced to take even more—I would say powerful steps that may be a little less palatable, in order to get control of a situation that is now just

totally out of control in various neighborhoods in my state where people are being raped and murdered by people that shouldn't be here because they are here illegally. We have got, of course, healthcare and education that is just going down because of this, and the quality for ordinary Americans of their healthcare and their education is being diminished.

We can't let that happen, and that is why Mr. Bilbray and I and others have been so diligent on the issue, and I would yield to my friend, Mr. Broun.

Mr. BROUN. Thank you, Mr. Rohrabacher, for yielding. I am really sorry that Mr. Luján would not yield me time, and particularly the tone of voice that he refused the time to me.

I was just going to answer your comment by telling you that my wife is tri-lingual. She speaks Spanish as well as Portuguese very fluently. She grew up in Indiana. She is a Native-born American. Her parents are both American citizens. She learned to speak Portuguese in Brazil when she lived there. She learned to speak Spanish in Honduras. Her education was in language education. Her first job was teaching English as a second language. We have a 19-year-old son, and I and my wife have encouraged him to learn Spanish because I understand the importance of American citizens, particularly the youth of this country, to be able to speak Spanish fluently.

I myself am bilingual. I speak South Georgian English, and I speak South Georgian redneck, but—and I wish I could speak Spanish. I did take Spanish in high school and in college.

I believe in a bilingual education. I believe that my kids and your—all of our kids should be able to speak Spanish.

I am concerned about the official language of our country. I introduced in Resources Bill if the site that we are going to vote on tomorrow was put into place, that English would be the official language of Puerto Rico if it is ever accepted as a state. It was rejected on a partisan line, and I am very discouraged with that. I introduced an amendment to the bill for tomorrow that would do the same thing. My guess is that my amendment is not going to be accepted.

So I am sorry you took that tone of voice and that kind of an attitude, because I do believe in Spanish education. I do believe in Spanish and bilingual ability, and you and I agree on that. I just wanted to make that comment, and so I yield back, and I thank Mr. Rohrabacher for yielding.

Mr. BAIRD. Mr. Chairman.

Chairman GORDON. Dr. Baird is recognized.

Mr. BAIRD. If I may, I will yield to Mr. Luján in just one moment. For my friend, Mr. Rohrabacher, be careful the next time you see the Swiss ambassador because he may have a difference of opinion about how dysfunctional his country is with multiple official languages.

Secondly, Mr. Broun, I actually support your amendment, and I am an advocate of English, promoting English within our country, but the concern I had with respect was there seemed to be an assumption that if someone answers you in Spanish, that is prima facie evidence that they are here illegally, and that was a concern

I had, and I would yield to Mr. Luján if he wants to speak about this.

Mr. LUJÁN. And Mr. Chairman, I appreciate the time. I in no regard meant to offend any of my colleagues here, but my concerns did reflect those shared by Chairman Baird, Mr. Chairman, and sometimes I think, especially as a new Member, I may take things a little personal where there is concerns, but by no means did I mean to cause any offense. I do apologize if that was caused.

I just certainly hope as we go forward because of some of the issues that have been raised around the country, that this is something that we are just—we just pay attention to a little bit.

Thank you.

Mr. BILBRAY. Would the gentleman yield?

Mr. BAIRD. Mr. Broun asked me to yield, and I am happy to.

Mr. BROUN. Thanks, Dr. Baird. I appreciate you yielding to me another moment or two, and I didn't want to—if my comment—I apologize also if my comment about people answering me in Spanish is any indication of their legal status here, because I have no questions about that.

My hope is that every one of them and my assumption is actually that every person who this Federal Government hires is here legally. I hope that that is true. I assume that that is true, just like I assume a lot of things that will be in question from our Administration and its statuses in this—about legal status of some members of our Administration being in this country. I don't question those things, but the point is we need to insure and my whole comment was geared towards we need to insure that the people that the Federal Government hires are here legally. That is what the law, federal law states, and that was my own comment.

So if I misstated or people misconstrued my statement, I apologize, and I hope that you will forgive me for doing so.

And then on a personal note I want to thank you for the garlic and the pepper that you gave me for lunch. It gave me—at least that bit of lunch. I actually did sneak a little bit of pizza, and I appreciate it, Dr. Baird.

Thank you so much. I yield back.

Mr. BAIRD. De acverdo de compañero. Rconozco Señor Bilbray.

Mr. BILBRAY. Mr. Chairman, look. We are not talking language here. In fact, I have seen studies that the second largest group of illegals in this country are Canadians. Okay. We are talking about the fact that there has been a policy in this country since the '90s that we do not subsidize illegal immigration. Since '96, it has been illegal to hire illegals, and we have an obligation to the American people to make sure their tax money is not subsidizing the violation of our laws.

All this does is continue a process that has been bipartisan. Mr. Shuler has been a great leader on that. Many of the Members here are original cosponsors, and this is the only way we can really look our constituents in the face and say, your tax—we have done everything we can to make sure your tax dollars are not subsidizing an illegal activity when it comes to the immigration status of employees.

This is a very simple system. Everybody is using it, and again, if Congress can use it, it just shows you how simple it is, and it

is one of those items that is a minimal kind of thing that we should do every time we talk about a grant, every time we talk about a contract we should do that, and I am very happy to see that the new Administration has been very aggressive at applying this to all contractors. I just think we should keep up the good work. A Sense of Congress as the Administration should apply the same concept to these grants.

And I yield back.

Mr. BAIRD. To close out, before my time expires, there is just one other side to this that I think we need to also mention. The contrary is also true. We have suffered in lost competitiveness in many ways because world-class scientists, Nobel Prize winners, et cetera, from around the world have become increasingly disinclined to visit our country, and I have spoken literally to Nobel Prize winners who at our arrival points in JFK or elsewhere have been harassed by border people, and these folks have been invited by prestigious universities and conferences to come and share their wisdom and knowledge with us, and they have been treated—because they were from another country, they were somehow subhuman.

Now, we need to also recognize that. I don't disagree with the amendment. I support it, but we need to equally make sure we are more welcoming to folks who are coming here legally who have something to share with us, and I hope we will also look at that.

Chairman GORDON. Is there any—

Mr. HALL. Mr. Chairman.

Chairman GORDON. Yes, sir. Mr. Hall.

Mr. HALL. Mr. Chairman, I yield my time to Mr. Bilbray.

Mr. BILBRAY. Just one point to close on, Mr. Chairman. One of the big successes of this program, it applies to everyone across the board. It does not pick some are checked, and some are not. All applicants, all employees, and it is equal protection and equal enforcement no matter who it is, where they come from, how they speak, or how they may look. Everybody is treated equally on this program, and that is the secret of its success.

And I yield back.

Chairman GORDON. Mr. Grayson is recognized.

Mr. GRAYSON. Mr. Chairman, I am concerned that this amendment is outside or at least partially outside of our jurisdiction. It seems to me that this is a matter that is more properly before other committees of the House and that raising this matter is out of order, and I ask for a ruling on that.

Chairman GORDON. I would ask our counsel for advice.

Well, the ruling, Mr. Grayson, is that the bill is relevant, the amendment is relevant to the underlying text.

Mr. GRAYSON. Well, I would like to explore that for a moment if I may. Since there are other committees like the Homeland Security Committee, the Education and Labor Committee that might properly claim jurisdiction over this amendment, doesn't this potentially compromise the integrity of the bill itself by requiring the bill itself to be referred to those committees before Floor action?

Chairman GORDON. Mr. Grayson, I think the important thing here is that it is a Sense of Congress and not a mandate and that it is an area within only the jurisdiction of our Committee.

It would only apply to Title V there.

Mr. GRAYSON. All right. I am concerned about this, and I may raise this issue again, and I think that if this becomes a pattern on the part of the minority, then they may see me among other things asking for amendments like this to have a ruling and then appealing the ruling of the Chair and having a vote specifically on whether these amendments are germane, because frankly, I think they are not. I think they are political grandstanding.

Chairman GORDON. Thank you, Mr. Grayson.

Mr. ROHRABACHER. Mr. Chairman, I would like the gentleman's words to be taken down. That last comment was over the line.

Mr. GRAYSON. Well, I would remind the gentleman—

Chairman GORDON. Let us see, Mr. Grayson. Your time has expired. I would hope that Mr. Rohrabacher doesn't ask for time, but if he does, he will get it.

Mr. ROHRABACHER. I will not ask for time.

Chairman GORDON. Thank you, Mr. Rohrabacher. I think that we are about concluding this discussion. I think it demonstrates this is a sensitive issue that needs to be really a small part of a larger issue that we need to have a national conversation and a Congressional conversation respectful of all, but today we are dealing in a much more narrow sense. It is simply a Sense of Congress, and if I hear no further discussion, then the vote occurs on the amendment.

All in favor of the amendment, say aye. Opposed, no. The ayes have it. The amendment is agreed to.

The next amendment on the roster is an amendment offered by the gentleman from Illinois, Dr. Lipinski. Are you ready to proceed with your amendment?

Mr. LIPINSKI. I have an amendment at the desk.

Chairman GORDON. The clerk will report the amendment.

The CLERK. Amendment 062, amendment to the amendment in the nature of a substitute to H.R. 5116 offered by Mr. Lipinski of Illinois.

Chairman GORDON. I ask unanimous consent to dispense with the reading.

Without objection, so ordered.

I recognize the gentleman for five minutes to explain the amendment.

Mr. LIPINSKI. Thank you very much, Mr. Chairman. Thank you for the pizza. Hopefully I make things run a little more smoothly this afternoon.

My amendment would create jobs and support American manufacturers by improving procurement at our national labs and accelerators. Requires the Director of the DOE Office of Science to develop a plan for increasing purchases for domestic sources, especially purchases of hardware and instrumentation that we do not currently manufacture, and that is to develop a plan to do this.

The primary target of this amendment is not so-called commercial off-the-shelf, or COTS, hardware, but rather custom manufactured components that are used to built accelerators and other large scientific instruments. By fostering closer collaboration between Office of Science facilities and the small manufacturers who could fabricate these specialized parts, this amendment will result

in faster, more efficient procurement and products that better meet the precise scientific needs of our labs.

This amendment supports high-skill engineering, machining, assembly, and testing jobs at small companies throughout the country. These are manufacturing jobs that support innovation, not only at our national labs, but also in the chemical, semiconductor, and biotechnology sectors.

We need these jobs and the ability to manufacture cutting-edge equipment. I urge my colleagues to support this amendment. I think this can be very helpful in making sure that we have American manufacturers who remain on the cutting edge. It doesn't put in any requirements except to develop a plan to increase these purchases from domestic sources, so I believe we shouldn't run into any problems there. Hopefully we can agree on this, and I urge my colleagues to support this amendment.

And I yield back.

Chairman GORDON. Mr. Hall is recognized.

Mr. HALL. Mr. Chairman, I understand that the gentleman would like to increase the amount of equipment used in DOE research projects that is produced here in the United States, however, I would like to ask Dr. Lipinski what he really means by the term, "domestically-produced hardware," in his amendment. Is it—is hardware limited to electronics? Is it broader, and if so, what all does it encompass? Equipment, computers, electronics. What—how narrow or how wide is your expectation of the word, in using the word, "hardware?"

Mr. LIPINSKI. Well, we are really talking about custom-manufactured equipment that is used at the national labs. That is what we are looking at, that is what it calls for the plan to encompass. So that is what we are looking at.

I yield back.

Mr. HALL. I think you have satisfied my question. Thank you.

Chairman GORDON. Further discussion on this good amendment?

If not, the vote occurs on the amendment. All in favor, say aye. Opposed, no. The ayes have it. The amendment is agreed to.

The next amendment on the roster is an amendment offered by the gentlelady from Illinois, Mrs. Biggert. Are you ready to proceed with your amendment?

Mrs. BIGGERT. I have an amendment at the desk.

Chairman GORDON. The clerk will report the amendment.

The CLERK. Amendment 101, amendment to the amendment in the nature of a substitute offered by Mrs. Biggert of Illinois.

Chairman GORDON. I ask unanimous consent to dispense with the reading.

Without objection, so ordered.

I recognize the gentlelady for five minutes to explain her amendment.

Mrs. BIGGERT. Thank you, Mr. Chairman. As a follow up to our Energy Subcommittee discussion on earmarks in the Office of Science, I offer an amendment that would call attention to projects often paid for in the science account that may not support its mission, and with the language the Secretary would detail potential unmet needs and objectives that otherwise would have been met by

the Office of Science if Congressionally-directed projects did not carve out a significant share of its funding.

And the example that I mentioned in the subcommittee and one that some of you may recall is the Office of Science being earmarked for MRI machines in the last few years, and they cost about \$1 million a piece, and our—we are earmarking for various hospitals. Now, MRIs at one time were—would have been research and development, but I think that this is something that takes away money for much-needed research, and I think we need to stop the practice and keep every research dollar where it belongs in basic research.

So—and I am also confident that I think with this—with the amendment it would detour those from using science to pay for their pet projects when the project does not meet science—does not merit science research funding.

And with that I would urge passage of the amendment and yield back.

Chairman GORDON. If there is no further discussion, let me just quickly say that, again, I think one of the benefits of having vigorous subcommittee meetings is to find out these sorts of things. I am glad you discovered it. This would be a good addition to our bill.

And if there is no further discussion, then the vote occurs on the amendment. All in favor, say aye. Opposed, no. The ayes have it. The amendment is agreed to.

The next amendment on the roster is an amendment offered by the gentleman from South Carolina, Mr. Inglis. Is he here? Then we will give him just a moment if he is—he is pretty prompt.

Okay. Here he goes.

Mr. INGLIS. Mr. Chairman, I have an amendment at the desk.

Chairman GORDON. Okay. The clerk will report the amendment.

The CLERK. Amendment 025, amendment to the amendment in the nature of a substitute offered by Mr. Inglis of South Carolina.

Chairman GORDON. I ask unanimous consent to dispense with the reading.

Without objection, so ordered.

I recognize the gentleman for five minutes to explain his amendment.

Mr. INGLIS. Thank you, Mr. Chairman. This is a very simple amendment we discussed in Subcommittee that simply adds the words, “including hydrogen,” after liquid transportation fuels, and so the Office of Science’s Biological and Environmental Research Program is reauthorizing COMPETES. The language bears several differences from existing statute, one of them being that the mention of hydrogen has been removed.

This amendment restores an emphasis on hydrogen so this Administration is reminded of Congress’s commitment to hydrogen future.

We had some discussion at the Subcommittee that the idea is simply to make sure that the deletion of the language doesn’t give rise to the implication that it is intentional to take hydrogen out of this opportunity afforded by this section.

So it is simply adding the words, “including hydrogen,” after liquid transportation fuels.

And I yield back, Mr. Chairman.

Chairman GORDON. Is there further discussion on this, again, good amendment?

If not, then the vote is called on the amendment. All in favor, say aye. Opposed, no. The ayes have it. The amendment is agreed to.

The next amendment on the roster is an amendment offered by the gentleman from Nebraska, Mr. Smith. Are you ready to proceed with your amendment?

Mr. SMITH OF NEBRASKA. I am, Mr. Chairman. I have an amendment at the desk.

Chairman GORDON. The clerk will report the amendment.

The CLERK. Amendment 005, amendment to the amendment in the nature of a substitute offered by Mr. Smith of Nebraska.

Chairman GORDON. I ask unanimous consent to dispense with the reading.

Without objection, so ordered.

I recognize the gentleman for five minutes to explain his amendment.

Mr. SMITH OF NEBRASKA. Thank you, Mr. Chairman. This amendment reinserts in the bill language, included in the committee print but omitted from the ANS [amendment in the nature of a substitute], requiring the Director of the Office of Science to report to Congress periodically on the Bio-energy Research Center authorized in the bill.

The amendment requires the Director to prepare and transmit to Congress a research plan describing how activities authorized under the program will be undertaken within one year of enactment. The Director will also be required to update the research plan and report back to Congress every three years following the initial report.

This amendment replaces a previous reporting requirement which will be inadvertently deleted by repelling Section 977 of the Energy Policy Act of 2005, in this reauthorization. Because my amendment permits the Director to base his initial research plan on these previously-published plans, the burden of this requirement on the Office of Science should be minimal.

I thank the Chairman for his consideration, and I yield back.

Chairman GORDON. Thank you, Mr. Smith. Is there further discussion on the amendment?

If not, then the vote is on the amendment. All in favor, say aye. Opposed, no. The ayes have it. The amendment is agreed to.

The next amendment on the roster is an amendment offered by the gentleman from Texas, Mr. Olson. Are you ready to proceed with your amendment?

Mr. OLSON. Mr. Chairman, I have an amendment at the desk and ask for its immediate consideration.

Chairman GORDON. The clerk will report the amendment.

The CLERK. Amendment 003, amendment to the amendment in the nature of a substitute offered by Mr. Olson of Texas.

Chairman GORDON. I ask unanimous consent to dispense with the reading.

Without objection, so ordered.

I recognize the gentleman for five minutes to explain his amendment.

Mr. OLSON. Mr. Chairman, thank you for the opportunity to offer this amendment.

This amendment strikes activities regarding climate and environmental science activities from the underlying legislation. As is, this provision undermines the goal and purpose of this legislation, which has been sold as promoting competition and creating jobs, including climate research. This bill does neither.

In fact, by supporting efforts to collect information, the Administration has stated they will use to provide the background to create more regulation on businesses, this is the antithesis of a job creator.

In the district I represent, which has one of the largest petrochemical facilities in the entire world, the companies I have met with vindicated they will lose thousands of jobs. Again, this is not a job creator. This is not meant to trigger debate on the virtue of this research but to raise the point that this bill is not the vehicle in which it should be included, and as such I urge the adoption of the amendment and yield back the balance of my time.

Thank you, Mr. Chairman.

Chairman GORDON. Thank you, Mr. Olson.

Mr. Hall is recognized.

Mr. HALL. I thank you, Mr. Chairman. This amendment strikes the climate and environmental activities from the bill. However, it in no way prohibits the Department to continue to perform this research, and I agree with Mr. Olson that this section does not create jobs.

It could, however, be used as one of the bases upon which a regulatory regime could be built, and such regulations would place onerous burdens on already-struggling businesses, thereby jeopardizing the very jobs this bill is intended to protect and to promote.

Now, whether or not these activities should be authorized is a discussion for, I think, another time. This legislation is not the appropriate instrument for putting the Congressional stamp of approval on these activities. The section should be stripped out of the bill.

I urge all my colleagues to vote for the amendment.

Chairman GORDON. Dr. Baird is recognized.

Mr. BAIRD. Mr. Chairman, I oppose this and oppose it for a couple of reasons.

First of all, if the argument in support of the amendment is that a certain activity performed by an agency is inconsistent with the acronymic title of a bill, then we are going to have to be mighty careful or mighty broad with our acronyms.

And more importantly and more substantively, there is a long history of fundamental research being conducted within this particular agency that is of significant benefit to climate research, whether or not one endorses the belief, and I don't think it is a belief. It should be a judgment, not a belief, but whether or not one endorses the judgment about anthropogenic climate change.

And let me give you some examples. In the early days of the Atomic Testing Program, a couple things became important. Tracking atmospheric distribution of the clouds that emerged from nuclear testing became central to understanding not only domestic testing but a potential ramification should these weapons be used

in war. So a fair sophistication was developed in tracking plumes of radioactive material, and that turns out to be pretty helpful in climate.

And to say, well, we are going to say you can't use that research knowledge or technology or methodology just seems to be counter-productive.

So, too, this entity was involved with decontamination of soils. Now, that is an environmental function, and in my district we have got the Hanford Nuclear Reservation right up the road, or up the river rather, and it is awfully important to us that we can learn more about decontamination, and my fear is that this amendment is going to really unwisely constrain key activities that are beneficial.

And then finally, there is the implicit assumption that anything dealing with climate costs jobs. I think the evidence is actually to the contrary, but I would save that for another debate, but there are fundamental issues here of science that is applicable across a number of disciplines related to the environment and climate that I would hate to constrain and therefore, would encourage defeat of this amendment.

Chairman GORDON. Thank you, Dr. Baird. Let me just point out. I mean, you know, there are a variety of, I guess, opinions in terms of the validity of climate change. This is really not a discussion of climate change today.

The Department of Energy was authorized to research climate research since the *Global Change Research Act of 1990*. So this is not something that was sort of sneaked in to give them a way to do something. This is authority they have had for many years.

And does anyone else wish—Mr. Rohrabacher.

Mr. ROHRABACHER. I don't fully understand why if we are already conducting climate research in various departments and agencies, why that has to do—has to be in this bill. Is that not—does that not obscure the purpose of this bill and for those of us who have a disagreement, an honest disagreement as to the nature of manmade climate change, we see much of the legislation, and, again, an honest disagreement, as to whether or not pursuing that creates jobs or hinders jobs.

So including this in the bill, which is extraneous, because this type of research is going on elsewhere, does nothing but put the onus on those of us who do believe that manmade climate change is not what the folks on the other side of the aisle believe manmade climate change is, that puts us in a position of we are actually putting something into this bill that will work against the creation of jobs by our frame of reference.

Why put this in the bill at all if you have got this type of research going on and permitted and financed in various pieces of legislation, various departments and agencies around the government?

Mr. Olson, I would yield the balance of my time to Mr. Olson.

Mr. OLSON. Thank you to my friend, Mr. Rohrabacher, from California, and with respect to my colleague from Washington, I would just like to invite you to come down with respect to the job loss, sir. Come on down with me to the—to Texas to the Port of Houston and the petro-chemicals along that area. I will guarantee you they

will talk to you about how climate change and the legislation that is pending before this Congress will cost them jobs, will increase their cost to doing business. Probably some of them are going to go overseas.

And so the statement that it doesn't affect jobs is just, at least in my world, that is not very accurate, and, again, I don't believe that we should be doing this. We have got legislation and agencies throughout the Federal Government. My district also includes the Johnson Space Center, and we have got, as this committee knows, with Committee jurisdiction, there is tremendous changes and issues going on there. One of the changes is we are generating money by canceling the Constellation to change NASA [National Aeronautics and Space Administration] to get them more involved in climate control, climate monitoring, global monitoring.

And, again, I don't believe that is NASA's—NASA's fundamental mission is human spaceflight, and, again, I take a little umbrage to the fact that it does involve jobs. I mean, it really does, and I would love to have you come down and tour the Port of Houston facility.

Yield back.

Chairman GORDON. Thank you. Let me just again point out, Mr. Rohrabacher asked a good question. Why is this in this bill? Well, the reason it is in this bill is that we are authorizing the Office of Science within the Department of Energy, and again, since at least 1990, this has been part of their responsibility.

So this is nothing new, and this is where it is supposed to be. It would be odd if it wasn't there.

And, you know, this is not a debate about climate change, and I even hate to get into that, but let me just point out that Vice President Cheney once said that if there was a one percent chance there was a terrorist attack, then we need to take strong action. You know, there may not be a consensus here, but I think at least one percent of this committee would think that climate change is real, and it wouldn't be inappropriate, if necessary, you know, to have some research.

Mr. ROHRABACHER. Would the gentleman yield?

Chairman GORDON. Certainly.

Mr. ROHRABACHER. Well, obviously that is true of all kinds of spending that is in various departments, all kinds of research projects that are in various departments and agencies. Why highlight one? Why highlight this particular one when obviously there is some fundamental, I would say honest, but fundamental disagreement on the validity of this whole theory. We are highlighting it here as compared to all those other programs that, like you say, are also within those departments and agencies.

Chairman GORDON. Well, with all due respect, you are the ones that are highlighting it. We are—this is a part of an already existing function in the Office of Science within the Department of Energy, and so this is not something that is trying to be done that is special there.

Mr. ROHRABACHER. All right. Thank you, Mr. Chairman.

Chairman GORDON. If no one else seeks—

Mr. ROHRABACHER. Could I yield—I would ask that Mr. Olson—okay.

Chairman GORDON. Okay. If no one else seeks recognition, then the votes occur on the amendment. All in favor of the amendment, say aye. Opposed, no. The no's have it. The amendment is not agreed to.

The next amendment on the roster is an amendment offered by the gentleman from California, Mr. Bilbray. Are you ready to proceed with your amendment?

Okay. Excuse me. We will let Mr. Bilbray have a second shot at a later date, and let us see. You are the cosponsor? If you don't mind, we will wait for Mr. Bilbray to come back, but now, he is going to have to wait his turn when he comes back. Okay.

The next amendment on the roster is an amendment offered by the gentleman from Texas, Mr. Neugebauer. Are you ready to proceed with your amendment?

Mr. NEUGEBAUER. I have an amendment at the desk, Mr. Chairman.

Chairman GORDON. The clerk will report the amendment.

The CLERK. Amendment number 068, amendment to the amendment in the nature of a substitute offered by Mr. Neugebauer of Texas.

Chairman GORDON. I ask unanimous consent to dispense with the reading.

Without objection, so ordered.

I recognize the gentleman for five minutes to explain his amendment.

Mr. NEUGEBAUER. Well, thank you, Mr. Chairman. I think maybe this is a little bit of a continuation but a little bit different twist on the previous discussion, and that is that it says that the top priority of the ARPA-E Program is to reduce our dependency on foreign oil.

You know, throughout the—this bill before us, the reduction of greenhouse gas emission is emphasized as a policy objective, which I see regrettably at the expense of exclusion of energy independence. While the two can overlap, there are two important differences that we cannot ignore here.

The most glaring is that technologies that sometimes enhance the development and production of conventional energy resources but these resources, you know, can sometimes increase the greenhouse gasses, by they are equally important. In fact, to many of us that we find that if we are truly going to be energy independent, that we will have to continue to develop some of those resources.

But in doing so, you know, I believe that even though some of these may increase the greenhouse emissions, we can make sure that we do everything possible at the same time to reduce the impact or reduce the increase in greenhouse gases, but I think that any kind of research dollars or funding that we are doing as a Nation right now, I can't think of a higher priority from a national security standpoint or an economic security standpoint or creating jobs, retaining jobs, but more importantly, making sure America does not lose its competitive edge. And we are on the edge here in many cases, particularly as our dependence on foreign energy, of really compromising our competitiveness in the reach of the world.

In fact, when you look at the countries that we are competing for, they are all out circumnavigating the earth, making deals for en-

ergy resources in the future. So my concern is is this particular piece of legislation tilts us in the direction of reduction in greenhouse gases when I believe that a better, more sensible direction and directive ought to be that we work on energy independence as the primary goal and certainly as we are doing that, looking for ways to also reduce greenhouse gases. But I believe that this particular piece of legislation tilts us in the direction of just reduction of greenhouse gases is the primary objective, and I believe—I would hope that everyone on this committee believes that America’s dependency on foreign energy is a real threat to our country and that as a country one of our goals ought to be to move in the direction of energy independence.

And so with that, Mr. Chairman, I would encourage folks to vote in favor of this amendment for the future of our country.

Chairman GORDON. I appreciate my friend’s comments, and I share your interest in trying to reduce our dependency on oil, but I don’t want to change from being dependent on foreign oil to be dependent on foreign technology. So there is a balance. If we want to become energy independent, I think that we need to be looking for all sources, and already, a main purpose of ARPA–E as stated is to reduce energy imports.

So for that reason I would oppose this amendment.

Anyone else wish to be recognized?

If not, the vote occurs on the amendment. All in favor, say aye. All opposed, no. The no’s have it. The amendment is not agreed to.

The next amendment on the roster is an amendment offered by the gentleman from Nebraska, Mr. Smith. Are you ready to proceed with your amendment?

Mr. SMITH OF NEBRASKA. Yes, Mr. Chairman. I have an amendment at the desk.

Chairman GORDON. The clerk will report the amendment.

The CLERK. Amendment 015, amendment to the amendment in the nature of a substitute offered by Mr. Smith of Nebraska.

Chairman GORDON. I ask unanimous consent to dispense with the reading.

Without objection, so ordered.

The gentleman is recognized for five minutes to explain his amendment.

Mr. SMITH OF NEBRASKA. Thank you, Mr. Chairman. This amendment is intended to address an apparent inconsistency between the ARPA–E Governing Statute and the execution of the program.

When the National Academy of Sciences recommended creating ARPA–E in 2005, it was very clear the program should be built upon certain foundational principles, specifically it should fund, “out-of-the-box transformational energy research in those areas where industry by itself chooses not to undertake.” The statute establishing ARPA–E directs the program to pursue long-term development of energy technologies by accelerating technology advances in areas that industry by itself is not likely to undertake.

In other words, ARPA–E is supposed to fund top-level, out-of-the-box ideas, not seeing investment by private industry. This language is very important because it provides direction and sets boundaries to ensure the work sponsored by ARPA–E does not duplicate exist-

ing private investment reflecting the appropriate role of government.

Unfortunately, in the first round of ARPA awards in August of '09, several of the projects funded appear to duplicate existing private-sector investment with federal funding. Clearly, if these projects are able to attract significant amounts of private investment, they are by definition outside the scope of ARPA-E.

Further, involvement in technology areas where the private sector is already active risks putting the government in a position of picking winners and losers, potentially crowding out future investment by private capital. This amendment aims to address this problem by enhancing the principles set forth in the existing statute stating the program should avoid funding ideas that are already being pursued by private industry. It does so in three ways.

First, it requires in applying for ARPA-E funding, applicants disclose the extent of current and prior efforts in the technology area for which funding is being requested.

Second, it explicitly tasks the Director of ARPA-E with ensuring and making awards program managers adhere to the language and existing law, stating that the program should not fund technology areas already being pursued by industry.

And third, requires the ARPA-E annual report to include a summary of the instances of and reasons for ARPA-E funding projects in areas already undertaken by industry.

It is my hope these simple steps reinforce the original mandate of ARPA-E, providing funding for top-level research outside the scope of the private sector rather than duplicating existing private efforts.

I thank the Chairman and yield back the balance of my time.

Chairman GORDON. Thank you, Mr. Smith. As usual you have a sensible improvement to—

Mr. BAIRD. Mr. Chairman.

Chairman GORDON. Dr. Baird.

Mr. BAIRD. I was inclined to accept this because I think I understand what you are saying, Mr. Smith, but there is a premise that you said that I don't support. If I heard it wrong, correct me, but it sounded like you were saying if there is any significant private investment in an area, then ARPA-E is not appropriate to that area.

One of the strengths of ARPA-E, in fact, is that it is stimulating and leveraging private sector capital, and the way it works is, and I don't know if you have talked to some of the entrepreneurs who are in this field, but I have talked to many, many, many, and what ARPA-E can do is help leverage some of the private sector capital, particularly on rather speculative explorations, which are kind of precisely what we want to have happen, and it would go like this.

The potential cost of developing a breakthrough technology given the risks and expenditures and the reach that it may take to get there is sometimes prohibitive in a quick return, capital investment market.

But ARPA-E comes along and says, we think there is potential here. You have got some great scientists, you have got a great idea, we are going to kick in some of the money to help make that happen, and if we deny that money, I think we are actually being very,

very counterproductive. And my fear, Mr. Smith, is however well intended this may be, I think you are going to have huge unintended consequences, and I can't support it for that reason.

I would urge you to run this by some of the—you obviously don't want to be saying, you know, pick your big energy company, they are spending a lot of money, we are just going to give them a little more money, but neither do you want to say that we are going to freeze out Venture Cap, for example, or even the big guys if they are working on some—I would be happy to yield some time to hear your thoughts on that.

Mr. SMITH OF NEBRASKA. Sure.

Chairman GORDON. And if I could, it is not a mandate. He is not requiring that if you have funds from elsewhere that you cannot get it. It is just it has to be disclosed, and that the, you know, the Director then will have to make some determination, and then I would say to Mr. Smith, this is not a situation where one company has been making investment, and then they say, okay, give me some more.

By and large, what is happening is they may be going in a particular direction, and there will be a consortium that will come in, each bringing in different types of good ideas, as Mr. Baird says, then to scale it on out to something that can be beneficial.

Mr. SMITH OF NEBRASKA. Right, but to be—to add emphasis, I guess.

Chairman GORDON. Okay. Mr. Smith is recognized.

Mr. SMITH OF NEBRASKA. Thank you. It does not preclude it, but it simply discloses and monitors it so that we can make sure that there is not a duplication or an unnecessary use of taxpayer dollars when private venture capital or other sources are more appropriate.

Mr. BAIRD. I share that and I don't know if I—somehow the time got lost from me there. I think I had some left, so let me reclaim what I had left.

I just want to be real careful that we don't take entrepreneurs who should be working in energy exploration and development and turn them into people who have to research how much capital is gone, because one could say—let us suppose I am working on an innovative technology to separate hydrogen and oxygen from water and then use it in a fuel cell for example.

In the course of what should be trying to make the pitch for the energy potential of my application, I don't want to make those people then turn into researchers, into prior investments, et cetera, et cetera. I want their focus to be on energy, not spending a lot of time saying, well, you know, BP did this, and Shell did this, and Solar World did this. I don't know how to avoid that, but you see what I am trying to get at? Similarly, I don't want ARPA-E, which is meant by its nature to be a nimble, quick operation, to say, well, we are going to have to go backwards and ask how much did BMW spend on hydrogen?

What is your response, if I may, to that?

Mr. SMITH OF NEBRASKA. Well, I mean, there is no specific prohibition. I mean, there is still the flexibility there that, as you have pointed out, is one of the benefits of ARPA-E and should continue to experience that. I mean, that is what we need. It is just that I

don't want these taxpayer dollars supplanting other private dollars that are more appropriately spent.

Mr. BAIRD. I share that concern. And maybe this is yet to be resolved, and we don't have to solve it here, but it would be one thing if I am working for a major company, and I know exactly what my particular company has spent on the investment up to now, and I just say the company I work for has already invested X amount of dollars. And then the Secretary can say, okay, I get it. We still think it is worthwhile.

Is the gentleman suggesting, though, that that disclosure should be total private sector investment on the issue or just the particular entity for which you work?

Mr. SMITH OF NEBRASKA. The particular entity or applicant, not other private—

Mr. BAIRD. That is a helpful clarification. I think. I appreciate that and yield back.

Chairman GORDON. Dr. Baird, I would say that Mr. Smith's amendment is made in good faith and not intended to undermine anything that we would want, but I would also say that I would hope that we would accept it and continue to discuss it. More knowledge can come about between now and later, and I don't know that it needs to be, but we ought to continue to discuss it.

Mr. Rohrabacher is recognized.

Mr. ROHRABACHER. Mr. Chairman, and, again, I respectfully disagree with my good friend, Mr. Baird, that that is not—the purpose of you described it is not the purpose of ARPA-E. It is not to bolster private efforts. It is basically, and if I might read from the authorization of ARPA-E, it is, “accelerating transformational technological advances in areas that industry by itself is not likely to undertake because of technical and financial uncertainty.”

And the fact is we are supposed to be taking—this—ARPA-E is supposed to go—and Mr. Smith has heard this over and over again, to finance those projects that private industry won't finance because it is too risky, but we have accepted the fact that some of the experts at ARPA-E will determine, maybe these will have a potentially high payoff for the country, but they are too risky for private industry to finance.

That is basically what we are talking about here, but we are evolving into a subsidizing of efforts that aren't—don't quite meet that threshold.

Let me give you an example.

Mr. BAIRD. Would the gentleman yield in a moment?

Mr. ROHRABACHER. Yes, I will, in a moment. We have—I have three examples here of ARPA-E funding. It is phonetic devices received \$1 million in capital, venture capital, before ARPA-E gave them an award. Flow—design industry received a major investment of \$8 billion before ARPA-E gave them their grant.

Sun Catalytics I guess it is, received \$1 million in funding, venture funding, from the private sector prior to ARPA-E giving them their grant. It is—we have been sold on the idea that ARPA-E is necessary for companies that are involved in projects that cannot attract private-sector investment.

So what we should be doing here is exactly what Mr. Smith is trying to achieve, and that is making sure that all of this is trans-

parent so we can decide as in our oversight capacity, as to whether or not ARPA or any other organization is meeting the goals and the criteria that we have set out legislatively.

And I would be happy to yield to my friend, Mr. Baird.

Mr. BAIRD. My friend, I am afraid you put words into my mouth and then refuted the words that I didn't say but you said on my behalf, and so I want to reclaim my own words.

Mr. ROHRABACHER. All right.

Mr. BAIRD. I think what you said is pretty much what I said. I don't think I said the purpose of ARPA-E is to bolster private enterprise. I think what I said was there are certain high-risk activities that ARPA-E can contribute to that the private sector may decide financially that is not, on and of itself, a high enough probability of return, but it may have huge upside potential. We see the same in medications, et cetera.

The other thing I want to just underscore, if I may, we run a—the nature of this industry is such that venture cap plays a critical role, and these entrepreneurs by necessity are going to pursue venture cap money and ARPA-E money simultaneously. We really are going to mess up the whole enterprise if we say, you can apply to ARPA-E, but the minute you get some venture cap, you are toast. Because you are going to actually implode the whole thing because ideally if you have got a good idea, you ought to be pursuing it in every way you can, and if we suddenly tell people, you know, if you get a dollar of venture cap, you are going to lose your ARPA-E or vice versa, I think we are creating a really bad model there.

Mr. ROHRABACHER. Reclaiming my time to just say, we may not have a disagreement, but we both agree on transparency, and that is what this—

Mr. BAIRD. One-hundred percent with the transparency argument.

Chairman GORDON. Governor Garamendi. Okay. It looks like after we ran around the bush, we are all back together. So once again, thank you, Mr. Smith, for this amendment, and we will, again, we will continue to look at it and see if it needs any clarification, but it looks to me like you are going the right direction.

So if there is no further discussion, the vote occurs on the amendment. All in favor, say aye. Opposed, no. The ayes have it. The amendment is agreed to.

The next amendment on the roster is an amendment offered by the gentleman from Texas, Mr. Olson. Are you ready to proceed with your amendment?

Mr. OLSON. I have an amendment at the desk, Mr. Chairman, and ask for its immediate consideration.

Chairman GORDON. The clerk will report the amendment.

The CLERK. Amendment 006, amendment to the amendment in the nature of a substitute offered by Mr. Olson of Texas.

Chairman GORDON. I ask unanimous consent to dispense with the reading.

Without objection, so ordered.

I recognize the gentleman for five minutes to explain his amendment.

Mr. OLSON. Mr. Chairman, thank you for the opportunity to offer this amendment.

This amendment seeks to do two things. First, in the ARPA-E title in regards to awards that the Director may initiate, it changes the word, "shall," to "may." As it stands the Director would have to make a variety of different awards, grants, contracts, cash prizes, and other transactions regardless of whether they are fitting topics or worthy applications.

To me this is not a wise use of taxpayer funds and undermines the competitive nature of this endeavor in particular and this legislation in general. I think changing it to "may" will give the Director the flexibility to fund projects as he or she sees fit.

And secondly, the original COMPETES language that was adopted three years ago stipulated that ARPA-E would hire no less than 70 employees and no more than 120, and this was done intentionally to keep ARPA-E nimble and agile. The bill language before us today would eliminate that limitation, thereby allowing the staff of ARPA-E to be unlimited in number.

Although subsequently amended, there was an attempt to allow ARPA-E to have its own legal counsel, procurement staff, and program directors instead of what existed in the Department of Energy. The manager's amendment has kept the language on staffing in place but removed the specific references to particular staff.

However, there is nothing to prevent report language from directing the Department of Energy that the intent of this language is for them to have separate staff in these positions. The intent of these changes is troubling, because although I was not here for the creation of ARPA-E, I understand it was not meant to be its own quasi department. Actions like unlimited hiring and having offices apart and aside from the Department of Energy certainly make it appear as if it is.

Thank you, Mr. Chairman. I urge adoption of the amendment and yield back the balance of my time.

Chairman GORDON. Thank you, Mr. Olson, for this clarification. Is there any further discussion?

Dr. Baird.

Mr. BAIRD. Mr. Chairman, a friendly suggestion on this. I have done some checking, and it is my understanding that if the gentleman's language were to pass, he would effectively be requiring a doubling of the current staff of ARPA-E, thereby growing government.

And the reason for that is the numbers specifically set both a floor and a ceiling, and ARPA-E does not yet achieve the floor, and so if you are insisting that the floor be achieved, you would actually be insisting that we hire new employees to meet the floor, at least that is my read of it, and I am not sure that is his intent.

That would be the first point I would make. The second point is if you want to be quick and nimble and responsive, which ARPA-E has already distinguished itself as, you may have to actually have some of your own staff. We are not necessarily mandating that you do, but if, you know, as a business model if you want to create a branch of your business that is most effective, you are going to want to have some in-house resources and for us to here arbitrarily constrain ARPA-E, I appreciate the ceiling number, but I don't think we should get into saying, well, you can hire this kind of person and that kind of person but not this other kind of person.

But, anyway, maybe staff can correct me, but my understanding is ARPA-E current staff is about 16. They are planning to go up to about 35, and they may start reaching the higher numbers later on, but would counsel tell us if this amendment as you read it require ARPA-E to go out and hire a bunch of people to comply with the amendment? Or is there a need to change it?

Mr. COUNSEL. The amendment would reinsert language that was struck in the amendment in the nature of a substitute from the original ARPA-E statute that required 70 to 120 employees for ARPA-E.

Mr. BAIRD. So if they have 35 now and he is now reinstating language that requires them to have 70, are we not effectively requiring them to have 70 potentially or run afoul of this legislation?

Mr. COUNSEL. Yes. The original language that was struck in the ANS said the Director shall appoint not less than 70 and not more than 120 personnel under this section. The current staffing of full-time employees at ARPA-E is 16, I believe, and the budget for next year calls for up to 35.

Mr. BAIRD. I thank Counsel. In the interest of not growing government, I would have to oppose this.

Mr. OLSON. Mr. Chairman.

Chairman GORDON. I will take my time, to clarify, Mr. Olson, this was not an effort to try to take the ceiling off and have a great bureaucracy. It was really an effort to not have a floor. We didn't want to force them to have to have 70, and so I think we are all trying to accomplish, you know, the same thing.

Mr. ROHRABACHER. However, the ceiling has been eliminated as well as the floor.

Chairman GORDON. So, again, and they are at 16, not wanting to go, you know, more than 35. So what I would suggest is that we can either have a vote or you might withdraw this. We will work a little later. Again, we were trying to get to the same place in that, I mean, you were trying to stop at the top, we were trying to force you for making them have more.

Now, when they need them, they ought to have them, but that is not anytime soon.

Mr. ROHRABACHER. Mr. Chairman, would you be going on record as then agreeing to reinstating the ceiling as this goes to the Floor?

Chairman GORDON. You know, I would—I think that we would, but I would rather discuss it, and we can deal with it later.

Mr. ROHRABACHER. I would recommend to Mr. Olson to accept the Chairman's very generous offer.

Mr. OLSON. I appreciate the Chairman's offer, Mr. Chairman, and I would be willing—much happily talk with you about keeping the ceiling and just eliminating the floor. If that is a concern, it sounds like there are 16 people there, we can all agree to it, but thank you very much for—

Chairman GORDON. Yeah, and so we will work together to come up with something that is a compatible, but, again, the purpose of that was not at any time soon to force them to have to hire people.

Mr. OLSON. I appreciate that, sir. Thank you.

Chairman GORDON. Okay. Governor Garamendi.

Mr. GARAMENDI. The amendment also deals with who can be hired. Is that correct? By suggesting that certain people could not

be hired, for example, lawyers and the like. Is that part of the amendment?

Mr. OLSON. That is not part of the amendment, sir. What the amendment does is it prevents them from hiring specific positions within ARPA, positions that are in the Department of Energy. And right now my concern is getting, you know, growing government here, getting duplicative personnel within the Department and at ARPA, when, again, there is not an authorization or—

Mr. GARAMENDI. Thank you for the response. If an organization is going to run, and I did run an organization in government like the Department of Interior's Deputy Secretary, in various sections to have a staff that is directly responsible to the Administrator or the Director in this case, it is very important in terms of efficiency and effectiveness, and we ought to be able to—we ought to allow the Director of this ARPA-E to hire those people that are necessary to carry out the task. That may be a lawyer, it may be a financial wizard of one sort or another or a scientist of any type.

By not allowing them to hire those kinds of people that may be in a completely different section and not readily available to ARPA-E, you may severely limit the effectiveness and the efficiency of ARPA-E.

So I would suggest that that particular requirement that apparently is in your amendment not be there and that we allow the Director to hire those people necessary to carry out their task.

Does that mean that the overall Department will increase? Not necessarily. There are hiring restrictions within the Department, authorizations for certain numbers of personnel within the Department, and it may be that that lawyer comes from the General Counsel's office and works directly in ARPA-E with funding for that lawyer coming from ARPA-E.

So I think that as we study this, Mr. Chairman, we ought not restrict the ability of the Director of ARPA-E to bring onboard using ARPA-E's budget those people that are necessary for the efficient and effective management.

Chairman GORDON. I think the gentleman has agreed to withdraw his amendment. I think that, again, the thrust here is that with some there is some concern about ARPA-E and some concern or mistrust from our standpoint that are comfortable with ARPA-E is we wanted to really show an abundance of confidence there.

So why don't we continue to work a little bit on this, and then we will try to come up with something that is good public policy and that we all feel comfortable with.

Is that acceptable, Mr. Olson?

Mr. OLSON. That is acceptable, Mr. Chairman, and just one clarification I would like to make. I mean, my amendment—it is not my intention to restrict the personnel that the ARPA Director could hire. My purpose is to not go out and start hiring specific new positions and creating new positions within ARPA. If the Director believes he needs an attorney, then he or she can hire an attorney, but I don't want to create this bureaucracy and start putting out titles, which as we all know have an impact in the Federal Government.

I mean, once you get—as you get the hierarchy up there, become SCS and those type positions, then things, all sorts of things would

come into play. I want him to have his freedom. I appreciate the Chairman's comments and look forward to working to make the clarifications that we have talked about here.

Thank you.

Chairman GORDON. Thank you. We are getting ready to start several votes here. I have to meet somebody outside. Mr. Baird is going to help us get through two or three more amendments, and then with no objection we will convene again 15 minutes after the last vote.

Chairman BAIRD. So Mr. Olson has withdrawn his amendment, and I thank you and hope to personally be a part of that discussion as well because I think your amendment is well intentioned, and we can hopefully work with you on that.

The next amendment on the roster was the 37th amendment, but that has been withdrawn, so next—we will postpone consideration of Mr. Bartlett's amendment, the 38th amendment, on the list. We now move to—Mrs. Biggert has an amendment.

Chairman BAIRD. The clerk will report the amendment.

The CLERK. Amendment number 018, amendment to the amendment in the nature of a substitute offered by Mrs. Biggert of Illinois.

Chairman BAIRD. I ask unanimous consent to dispense with the reading.

Without objection, so ordered.

I Recognize the gentlelady for five minutes to explain the amendment.

Mrs. BIGGERT. Thank you, Mr. Chairman. My amendment strikes a construction exception for the Energy Innovation Hubs. The mission of the Energy Innovation Hubs is that of timely and goal-oriented research that could turn on a dime, and we need these, and I support what the Secretary proposes to do with each hub.

Unfortunately, the exception language here appears unlimited. I don't know if you know what a test bed is or not, and I would ask you when I finish here, but in the absence of appropriations to support all the hubs, I believe we should be judicious in our attempts to facilitate their deployment. And anyone working with the Department could justify a renovation or construction need if it is, "necessary for the research to be conducted."

So such exceptions could cause the hubs to become little national labs, totally undermining their mission and creating another drain on the funding, and so that is why I believe it is important at this juncture to include a basic prohibition on construction language.

And I would like to add that I work with my colleague and caucus Co-Chairman Mr. Carnahan, to support a building technologies hub, and I can understand the need for possible renovations or small demo projects to conduct building technologies research. However, in the absence of further appropriations, we—I think we would be foolish to create such a broad exception for all of these hubs.

I don't know if the language is quite where I would like to see it, but I think that, you know, this—there is no definition of test beds in this legislation, and with that I would urge—in other words, there is the energy frontier research centers and the tech-

nology hubs that I think are—there is some duplication with the labs, and so I think that this construction would be a bad idea.

And I would yield.

Chairman BAIRD. You want to yield or you want to yield back then?

Mrs. BIGGERT. Yes.

Chairman BAIRD. Okay. Thank you. Mr. Carnahan is recognized.

Mr. CARNAHAN. Thank you, Mr. Chairman, and I want to compliment my colleague, Mrs. Biggert, for her work co-chairing the High-Performance Buildings Caucus with me and working on many of these issues together. I really appreciate her leadership, but I do reluctantly and respectfully oppose your amendment, and I just want to give a couple of reasons why.

I think we sort of have the same goal with a different way to come about it, and that is this exception, which I think is important. First of all, we don't want these hubs to become national labs. That is why there is a specific deadline. They are authorized for only up to five years in a competitive process and for them to be—and they would have to compete after that to continue. We want to get this technology out quickly with resources and with urgency and to get results.

The other thing I think in terms of the exception for construction with advanced building efficiency, test beds, or to renovate existing buildings, there are specific limitations that could only be for the purposes of research and only if the Oversight Board determines that the test bed or renovations are limited in scope and scale necessary for the research to be conducted.

So I think there are specific limitations in this to be sure that these don't become national labs, and I guess the other examples I would say are say you are at a buildings hub and you want to construct a test bed or smaller-scaled building to test a design, without that section you would be limited from doing it.

The other example I would say if we did include renovations to existing buildings for the purposes of research but there is an Oversight Board that will have to approve such requests, so I think, again, there are limitations included in the bill that address your concerns.

Mrs. BIGGERT. Will the gentleman yield?

Mr. CARNAHAN. I would be happy to.

Mrs. BIGGERT. I think the issue that really troubles me is the test bed. I think that there could be any—asking for construction and just saying they are a test bed. I don't know what a test bed is, and there is nothing in this bill that defines that. So—

Mr. CARNAHAN. If the lady would yield, the *Energy Policy Act of 2005*, has a specific definition when they established the Advanced Building Efficiency Test Bed Section. I would be happy to provide that.

Mrs. BIGGERT. Yeah.

Mr. CARNAHAN. I think there is a definition.

Mrs. BIGGERT. Would the gentleman yield?

Mr. CARNAHAN. Yes.

Mrs. BIGGERT. I do have what the Act of 2005, says, but still the problem is that that was—we asked the Department of Energy to give us a definition and to give us what that was, and we have

never heard back from them, and I was upset with that because to try to look at this language. But what we did find is that in—there was an Advanced Building Efficiency Test Bed Initiative dated October 6 through May of '08, and in that it turned out that it really was an earmark. And so I have seen nothing—it looks like. I have seen nothing other than that earmark as being what is called a test bed, and I don't know whether people are just—could use that based on that or—other than any definition that is in the 2005, language, and I would really like to work with you, you know, to see if we could work out some limitation on that. I think that that opens the door to so many projects being called a test bed and asking for the funding, which in construction can eat up the whole, you know, the whole amount of money in a very short time.

Mr. CARNAHAN. Yeah. Reclaiming my time, I would be happy to work with the gentlelady in terms of that language just to be sure that we are limiting it as I think intended and that the funding is focused on research.

I yield back.

Chairman BAIRD. Mrs. Biggert, I share your concern, and I think my read of the Committee here is that I think everybody is on the same page here. I don't think anybody wants money that should be going to hubs to become just some excuse to build a new building to be named after the former dean or something. And we have seen that. That happens and—

Mrs. BIGGERT. Uh-huh.

Chairman BAIRD. —then when earmarks get in there, then it gets named after us, and that is even more fun. But there is general support of the principle here. I wonder if you might be kind enough to withdraw that on the commitment that we will work to try to clarify some of the issues you mentioned because I think there is strong agreement with the principle.

Mrs. BIGGERT. I would be happy to do that and withdraw the amendment.

Chairman BAIRD. I respect and thank that, and Mr. Carnahan and the Committee will work.

We are now down to five—

Mr. BROUN. Mr. Chairman.

Chairman BAIRD. Yes.

Mr. BROUN. How about Members of Congress? Can we name bills after Members of Congress?

Chairman BAIRD. Well, that is the exception. We will perfectly allow that. I hope that comes in the discussion.

We are down to five minutes, my colleagues. Consistent with Chairman Gordon's suggestion, we will recess until to five minutes after completion of the final vote of this series, and Ms. Johnson, my apologies, but we are not going to be able to do justice to your amendment in time. I don't—

Ms. JOHNSON. You know, you all need to stop meeting so much, because there are other committees that meet, too.

Chairman BAIRD. The Committee stands in recess.[Whereupon, at 2:32 p.m. the Committee recessed, to reconvene at 4:00 p.m., the same day.]

Chairman GORDON. Welcome back, everyone. Thank you for your patience.

The next amendment on the roster is the amendment offered by the gentlelady from Texas, Ms. Johnson. Are you ready to proceed with your amendment?

Ms. JOHNSON. Yes, Mr. Chairman. I have an amendment at the desk.

Chairman GORDON. The clerk will report the amendment.

The CLERK. Amendment number 113, amendment to the amendment in the nature of a substitute offered by Ms. Eddie Bernice Johnson of Texas.

Chairman GORDON. I ask unanimous consent to dispense with the reading.

Without objection, so ordered.

I recognize the gentlelady for five minutes to explain the amendment.

Ms. JOHNSON. Thank you, Mr. Chairman and Ranking Member, and I would like to thank the persons who have worked to pull this language together. That includes Congressman Bobby Rush, Congressman G. K. Butterfield, Congressman Inglis, Congressman Luján, and Congressman Gordon. The committee who worked together in a bipartisan fashion to perhaps strengthen, in their opinion, this language. I appreciate the time that many have spent here. When the Chair came to the Congressional Black Caucus I had to leave and go to the doctor about this voice that you hear, so I didn't get a chance to hear all the discussion.

But energy innovation hubs have the potential for transformative research that will yield breakthroughs in technology that can help meet our energy and climate challenges. This research will ultimately yield new technologies which will create new jobs for American families.

To ensure diversity within the hubs, my amendment calls for priority consideration with HBCUs [Historically Black Colleges and Universities], 1890 Land Grant Institutions, Hispanic Serving Institutions, PBIs [Public Benevolent Institutions], and Tribal Colleges. Together these are hundreds of universities which represent our Nation, and let me say, too, that this amendment in no way will affect, determine, or change the location of these hubs.

These universities maintain unique relationships with communities of color, and we should implement their ability to educate these communities on the opportunities in green industry and the techniques needed to succeed to a larger energy strategy. And I know that everybody gets tired of me bringing this kind of thing up, but I want to say that we can't simply walk away and not let a population this large not have an opportunity to be on course for the future.

The development of green energy Centers of Excellence at minority-serving institutions to research and develop new green technologies, as well as train implementers in the deployment of green innovation is more towards parity in a growing clean energy economy. Historically, most HBCUs and other minority-serving institutions do not have the same endowments, funding, grant-writing capabilities, and luxuries other universities have.

Despite these challenges, however, statistics show that HBCUs have managed to graduate students in stem fields at a higher rate than most traditional universities. The bill up for consideration

today focuses on particular weaknesses in our national scientific enterprise. I, and many of my colleagues from the Congressional Black Caucus, Congressional Hispanic Caucus, and the Diversity and Innovation Caucus and others, believe this amendment will strengthen the intent of the legislation.

We have seen the statistics showing minorities are falling behind the rest of the pack in the sciences for many reasons. I ask my colleagues on this committee to support this amendment that would increase the diversity in our growing clean energy economy. I in no way am asking that there be any special preparations. Everyone should be able to compete at that level but should be given an opportunity, and this is really for our Nation because we are far behind.

This is America COMPETES, and it must include all Americans, and I appreciate any support that I can get.

Thank you, Mr. Chairman. I yield back.

[The prepared statement of Ms. Johnson follows:]

PREPARED STATEMENT OF REPRESENTATIVE EDDIE BERNICE JOHNSON

Mr. Chairman, I have an amendment at the desk.

Thank you Mr. Chairman and Ranking Member.

I would like to thank my good friends and colleagues Representative Bobby Rush and Representative G.K. Butterfield for their hard work on this language, which was included in the House passed version of the American Clean Energy and Security Act of 2009.

I would like to thank Congressman Inglis, Congressman Luján and other Members on this committee who have worked together in a bi-partisan fashion to strengthen this language.

Energy innovation HUBS have the potential for transformative research that will yield breakthroughs in technology that can help us meet our energy and climate challenges. This research will ultimately yield new technologies, which will create new jobs for American families.

To ensure diversity within HUBS, my amendment calls for priority consideration with HBCU's, 1890 Land Grant Institutions, HSI's, PBI's and Tribal Colleges. Together, these are hundreds of Universities which represent every corner of our Nation.

These universities maintain unique relationships with communities of color.

We should implement their ability to educate these communities on the opportunities in green industries and the techniques needed to succeed in to a larger energy strategy.

The development of Green Energy Centers of Excellence at Minority Serving Institutions to research and develop new green technologies as well as train implementers in the deployment of green innovation is a move towards parity in a growing clean energy economy.

Historically, most HBCU's and other minority serving institutions do not have the same endowments, funding, grant-writing capabilities, and luxuries other universities have. Despite these challenges, statistics show HBCU's have managed to graduate students in STEM fields at a higher rate than most traditional universities.

The bill up for consideration today focuses on particular weaknesses in our national scientific enterprise. I and many of my Colleagues from the Congressional Black Caucus, the Congressional Hispanic Caucus, the Diversity and Innovation Caucus and many others believe this amendment will strengthen the intent of this legislation.

We have seen the statistics showing minorities are falling behind the rest of the pack in the sciences for many reasons.

I ask my colleagues on this committee to support this amendment to increase the diversity in our growing clean energy economy.

Energy innovation hubs have the potential for transformative research that will yield breakthroughs in technology that can help us meet our energy and climate challenges. This research will ultimately yield new technologies, which will create new jobs for American families.

This is America COMPETES, and it must include all Americans. Thank you, Mr. Chairman. I yield back the remainder of my time.

Chairman GORDON. Thank you, Ms. Johnson. You have been a champion here, and you are correct. This is an amendment for all Americans. We are all going to be better off.

Anyone else wish to comment? If not then, there is no further discussion.

Oh, Mr. Hall is recognized.

Mr. HALL. Mr. Chairman, at committee this amendment, the amendment in the bill referred to consideration as special consideration, and it is used that way in two other parts of the bill, and it says priority consideration. I am not sure what the difference is in it, but it seems like they ought to either all be priority, they ought to all be special, and it ought to have it said what priority means.

Chairman GORDON. If the gentleman would yield, I think the basis of this is that we are bringing bills or this bill is a culmination of coming from three different subcommittees, but I will yield to the counsel to address those definitions.

Ms. COUNSEL. We are aware of the term, "special consideration," appearing in the U.S. Code something like 130 times. The term, "priority consideration," appears in the U.S. Code something like 60 times. We are unaware of any place in the U.S. Code where either term is defined, so that is where we are at.

Mr. HALL. What—would an amendment be in—it seems to me in this particular bill it is mentioned "special" two other times and then another area it mentioned "priority." It looks like they ought to be the same, and they really ought to be defined.

Ms. COUNSEL. I can't speak to the use of the term in this amendment versus other amendments, but in both cases I think there is an implication that there would be some level of additional consideration. What that might mean in terms of priority versus special it probably would be at the discretion of the Secretary.

Chairman GORDON. If the gentleman would yield, I think, you know, you raise a good concern about consistency. Why don't we try to work on it between now and going to the Floor and see if those folks that had a particular interest—most of this is the language that came out of their amendments, and we will see if we can't come up with some common term.

Mr. BROUN. Mr. Chairman.

Chairman GORDON. Oh. Dr. Broun.

Mr. BROUN. Thank you, Mr. Chairman. I would like to further ask the Counsel, if I may, could this be interpreted as particular discrimination for these minorities in selecting the—in selection of anything else? Is this specific preference given to these individuals where preference is given?

Chairman GORDON. This is more of a legislative question than a counsel question, and I think really you have a situation where there are mandates and then there is something less than that. This is certainly not a mandate, a requirement, a quota, or anything of that nature, so it would be less than.

Mr. BROUN. Thank you, Mr. Chairman. In fact, I was—that was what I was getting at is this—

Chairman GORDON. Yeah.

Mr. BROUN. —a mandate that we—

Chairman GORDON. No.

Mr. BROUN. —give preference to these groups of people, because I don't believe in discrimination for or against anybody. I think we ought to have equal opportunity for everyone, and we ought to be all treated equal under the law, and that is—I appreciate the Chairman and I appreciate Counsel's—and I hope we can define this, Mr. Chairman, as we go forward.

Thank you, sir.

Chairman GORDON. Ms. Johnson is recognized.

Ms. JOHNSON. Thank you for that question. In my mind in clarification it is to sensitize but offer no special preparation. They have to be the same as everyone else but to remember to be inclusive. That is all that—

Mr. BROUN. Would the gentlelady yield?

Ms. JOHNSON. Yes.

Mr. BROUN. Thank you, and I agree with you wholeheartedly. We ought to all have the same opportunities, no matter what our color of the skin is, no matter what gender we are, no matter whatever kind of inherent quality we are given by our creator. I agree. We all ought to have equal opportunity, and I agree with the gentlelady. Thank you.

Mrs. BIGGERT. Will the gentlelady yield?

Ms. JOHNSON. Yes.

Mrs. BIGGERT. Thank you. My question is just—we talked a lot about special consideration. Would priority be higher than that or lower?

Ms. JOHNSON. You know, I wasn't there when they were talking about this in the Committee. To be honest with you, I don't think it makes much difference. It probably made two or three Members of the Congressional Black Caucus feel better, but it is—I don't think it makes—

Mrs. BIGGERT. Okay.

Ms. JOHNSON. —that much difference.

Chairman GORDON. If the gentlelady would yield. That is our impression in that as the gentlelady, Ms. Johnson, said, it is the level of sensitivity, but it is not a mandate, and my feeling is that it really isn't a distinction.

Mrs. BIGGERT. Okay. Thank you.

Chairman GORDON. So if there is no further discussion, the vote occurs on Ms. Johnson's amendment. All in favor, say aye. Opposed, no. The ayes have it. The amendment is agreed to.

The next amendment on the roster is an amendment offered by the gentleman from Texas, Mr. Hall. Are you ready to proceed with your amendment?

Mr. HALL. I think I am. I have an amendment at the desk.

Chairman GORDON. The clerk will report the amendment.

The CLERK. Amendment 022, time stamped April 26, 2010, 11:59 a.m., amendment to the amendment in the nature of a substitute to H.R. 5116 offered by Mr. Hall of Texas.

Chairman GORDON. I ask unanimous consent to dispense with the reading.

Without objection, so ordered.

I recognize the gentleman for five minutes to explain his amendment.

Mr. HALL. Thank you, Mr. Chairman. This amendment would add R&D on conventional energy sources to the list of eligible activities that energy innovation hubs can pursue. And when it comes to energy policy, “energy independence,” is a lofty but common goal that both parties generally agree should be a top priority.

In order to reduce imports of foreign energy and achieve true energy independence, we need to do two things; one, reduce demand by advancing energy efficiency and alternative sources, and two, increase supply and production of our domestic energy resources.

Unfortunately and increasingly, we seem to be forgetting the supply side of this equation. The Energy Innovation Hubs Program authorizes and Title XI of this bill does not authorize R&D on, “advanced energy technology,” but then limits the definition of these technologies to those that advance energy efficiency and certain alternative energy sources.

If we truly are serious about energy independence, it doesn’t make sense to exclude R&D on fossil fuels that could increase domestic energy supplies and production and reduce foreign imports.

A little bit of federal investment in this area could go a long way. We have seen the first hand ever—over the last decade we have seen this with the explosion of domestic energy production enabled by advances in ultra-deep drilling technology. We passed—this committee passed some 3-1/2 years ago, and it has been working up to now. We should not exclude this type of energy from research from the program, and so any amendment, especially this amendment, simply builds on the—all of the above approach to energy independence by adding technologies with the potential to enhance domestic energy supply and production, including those relating to coal, oil, and natural gas to the list of eligible activities under this program.

And I yield back my time.

Chairman GORDON. Governor Garamendi.

Mr. GARAMENDI. Thank you very much, Mr. Chairman. If I might, my recollection is that there is an extraordinarily large amount of money that is going into the coal and oil research already from a different organization, different part of the Department of Energy. To you, Mr. Chairman, or perhaps Mr. Hall, is that the case, and if so, how much and instead of taking this limited source of money and using it for what is already being done in other parts of the Department of Energy?

Mr. HALL. Would the gentleman yield?

Mr. GARAMENDI. Yes.

Mr. HALL. It is my understanding and maybe I am wrong, that they are cutting fossil fuels that I am referring to here and a lot of it from R&D. Isn’t that your understanding?

Chairman GORDON. My understanding is there is a lot of money for carbon capture and sequestration in the coal area, but in terms of natural gas, we are seeing a lot of new reserves that have come about, we are finding out that there is a lot of natural gas that could be under the tundra, under the ocean. There are concerns about some of the processes of getting natural gas out. So I think that as a transition fuel that I don’t think there is that kind of research going in natural gas.

In CCS [Carbon Capture and Sequestration] there is a lot of money, and once again, this is not a mandate. This in essence allows the Secretary if there is a good idea that comes down the pike in these fields, to be able to accept them.

Mr. HALL. Would the Chairman yield?

Chairman GORDON. It is Governor Garamendi's—

Mr. HALL. Governor, would you yield?

Mr. GARAMENDI. Yes.

Mr. HALL. We just add these to where they won't cut it out, where they won't—leave it where it is considered this, too, is added to the list that they could consider.

Mr. GARAMENDI. Well, I will just close on this and just state my concern here is that the oil and coal industry have been very successful in capturing national subsidies, tax subsidies and other kinds of subsidies to advance their interests. My personal interest is to advance the other technologies. The point about natural gas was well made by the Chairman. My concern would be that the oil and coal industry might use this language to grab this piece of money, which I believe, at least for me, is intended for other technologies, other kinds of fuel sources.

So I will let it go at that.

Chairman GORDON. Well, I would just say if the governor would yield, it really won't be up to the companies. It will be up to the Secretary, and the Secretary might want to spend some money on how you might make this cleaner type of exploration.

Mr. GARAMENDI. Mr. Chairman, thank you.

Chairman GORDON. So if there is no further discussion, the vote occurs on the amendment. All in favor of the amendment, say aye. Those opposed, no. The ayes have it. The amendment is agreed to.

The next amendment on the roster is an amendment offered by the gentleman from Michigan, Mr. Peters. Are you ready to proceed with your amendment?

Mr. PETERS. I am, Mr. Chairman. I have an amendment at the desk.

Chairman GORDON. The clerk will report the amendment.

The CLERK. Amendment 033, amendment to the amendment in the nature of a substitute offered by Mr. Peters of Michigan.

Chairman GORDON. I ask unanimous consent to dispense with the reading.

Without objection, so ordered.

I recognize the gentleman for five minutes to explain the amendment.

Mr. PETERS. Well, thank you, Mr. Chairman. The legislation we are considering today will create new energy innovation hubs that will spur advancements in the growth in the field of advanced energy technologies. These hubs will encourage and support new partnerships in regions that conduct multi-disciplinary research and work collaboratively towards the commercialization of new energy technologies, and I applaud the Committee for including this important new initiative in the COMPETES Act.

As we work to find solutions that will put our Nation on a course towards energy independence, it is important that we acknowledge the role our transportation sector is going to play in this, and that is why I am offering an amendment that will include technologies

that relate to advanced vehicle and vehicle components to the definition of advanced energy technologies supported under this section.

This simple amendment assures that we support the development of new vehicle technologies that result in energy savings within these newly-created energy hubs, and this will include innovations in drive train technologies, hydrogen, fuel cells, or improvements to internal combustion engines.

I would also like to take this opportunity to thank Representative Inglis for his work on this issue and for his work helping on this amendment, and I also would like to thank him for his support in working to develop new advanced technologies.

I think we all agree that having a vibrant transportation sector is vital to our national economy and would urge all my colleagues to adopt this amendment.

Thank you, Mr. Chairman. I yield back.

Chairman GORDON. Is there further discussion on the amendment?

Mr. INGLIS. Mr. Chairman.

Chairman GORDON. Mr. Inglis.

Mr. INGLIS. Thank you, Mr. Chairman, and thank you, Mr. Peters, for your shared interest in improving vehicle technologies. This is a good amendment and one that will make it clear that we want to improve the vehicle technologies so that we can some day be free of Middle Eastern oil.

And so it is also a tremendous opportunity for our economy. Not only is it a National security risk, but there is an opportunity for job creation, especially in places like the fourth district of South Carolina, where the International Center for Automotive Research is stretching the boundaries of advanced technology research through a unique partnership between industry, academia, and the government. And so the energy innovation hubs present a similar opportunity to leverage this kind of—these kind of efforts to solve the key problems in transportation, including vehicles and vehicle components, alternative fuels, and related technologies that truly can transform the industry and reignite U.S. leadership in this field.

So I think this is a very strong amendment, and I encourage my colleagues to support it, and I yield back the balance of my time.

Chairman GORDON. Dr. Baird is recognized.

Mr. BAIRD. Yes. I just want to do two things; commend my colleagues for what I think is a very constructive amendment and also compliment my friend and Ranking Member who earlier I mentioned that Dr. Lipinski finished second. I believe Mr. Inglis finished fourth in today's race. So, Mr. Chairman, we have got good people. Of course, we always follow in your footsteps when you are in a race, but in your absence, we are doing well on this committee on a bipartisan basis.

Chairman GORDON. Is there further discussion?

Mr. BROUN. Mr. Gordon. Mr. Chairman.

Chairman GORDON. Dr. Broun.

Mr. BROUN. Thank you, Mr. Chairman. I want to congratulate Mr. Peters for this amendment. We have in my district at Brownsville Georgia and Road Atlanta we have got a company that is

doing advanced vehicle technology. They are utilizing racecars in trying to develop these technologies. It is absolutely critical that we go forward with this type of thing, and I want to add my very enthusiastic support for this amendment, and I congratulate for you bringing it.

And so, Mr. Chairman, I agree and like it. I yield back.

Chairman GORDON. We are glad to have you with us.

Is there further discussion on the amendment? If not, the vote occurs on the amendment. All in favor, say aye. Those opposed, no. The ayes have it, and the amendment is agreed to.

The next amendment on the roster is an amendment offered by the gentlelady from Illinois, Mrs. Biggert. Are you ready to proceed with your amendment?

Mrs. BIGGERT. Yes. I have an amendment at the desk.

Chairman GORDON. The clerk will report the amendment.

The CLERK. Amendment 100, amendment to the amendment in the nature of a substitute offered by Mrs. Biggert of Illinois.

Chairman GORDON. I ask unanimous consent to dispense with the reading.

Without objection, so ordered.

I recognize the gentlelady for five minutes to explain the amendment.

Mrs. BIGGERT. Thank you, Mr. Chairman. My amendment is straightforward. It simply clarifies that federally-funded research and development centers are eligible to compete for the energy innovation hubs.

I believe it is important that our labs are eligible to compete for the hubs, and more importantly, I believe it is essential to the hubs to utilize existing resources within the DOE complex, the modeling and simulation hub or the battery hub, for example, as well as there is work on the automotive that Mr. Peters' amendment, which could qualify using the labs and could—and I think that this would—very quickly we would be able to address these issues and when we would have the lab participation and existing facilities that won't have to be built or moved to another location to do this.

So I would thank your consideration and yield back.

Chairman GORDON. Thank you, Mrs. Biggert, you are correct that the labs are an outstanding resource for our country, and they certainly need to be utilized.

If there is no further discussion, then the vote occurs on the gentlelady's amendment. All in favor, say aye. Opposed, no. The ayes have it. The amendment is agreed to.

The next amendment on the roster is offered by the gentleman from New Mexico, Mr. Luján. Are you ready to proceed with your amendment?

Mr. LUJÁN. Yes, Mr. Chairman. I have an amendment at the desk.

Chairman GORDON. The clerk will report the amendment.

The CLERK. Amendment 048, amendment to the amendment in the nature of a substitute offered by Mr. Luján of New Mexico.

Chairman GORDON. I ask unanimous consent to dispense with the reading.

Without objection, so ordered.

I recognize the gentleman for five minutes to explain his amendment.

Mr. LUJÁN. Thank you, Mr. Chairman. I am pleased to introduce this amendment that I believe will support and spur innovation, support small business, and create jobs. Enhanced innovation and improved competitiveness will require non-federal entities, U.S. industry, and small businesses to work in partnership with federal R&D entities such as the DOE national labs.

Cooperative arrangements between public and private entities are an important mechanism for innovation and competitiveness. Every year across the many DOE national laboratories, there are many potential cooperative work agreements that go unrealized because the non-federal partner, often a small business, does not have the means for both the federal portion and their own portion of the work.

CRADAs [Cooperative Research and Development Agreements] are cooperative work agreements between a national lab and a non-federal entity. They are a mechanism by which basic science capabilities or technology that has been developed at a national laboratory can be matured in cooperation with a non-federal entity. Often these are initiated by a small business that sees a capability at a national lab that the small business believes can be turned into a marketable technology.

By statute, a CRADA must be consistent with the laboratory's mission. Both parties may contribute personnel, services, and property to the CRADA project, and the partner can provide funding for the laboratory's research.

However, the DOE laboratory cannot provide funding to the partner. To encourage DOE's laboratories to enter into technology partnerships, Congress began providing support specifically designated for federal portions of CRADAs in fiscal year 1991. However, in fiscal year 1996, Congress began to phase out these dedicated funds, relying instead on program managers at the laboratories to use their regular research funds for CRADAs. As a result, the number of CRADAs dropped dramatically as the dedicated federal funding declined.

Using data from the 2006 Technology Report from DOE, the number of CRADAs dropped from nearly 1,600 in 1996, when dedicated federal funding was at its peak, to about 600 in 2001, when dedicated federal funding was eliminated. This is a drop of nearly two thirds, demonstrating that other funding mechanisms, which have other priorities and demands, do not adequately support the full potential of CRADA work with the industry.

Currently there are no funds dedicated to pay for the national lab's portion of CRADAs, and an April 2010, a report from the Energy Technology Innovation Policy Research Group at Harvard stated that CRADAs and cooperative agreements involve closer coordination between parties than grants that work for other agreements. This is important for energy innovation because as they stated, public, private partnerships increased the funding available to projects, add expertise and other resources, and help bring technology into use.

This means that in most cases the small businesses will need to pay 100 percent of the cost, both their own as well as the cost to

the national lab. The national lab cost represents a large financial barrier, especially given the risk of not knowing whether the matured capability will be successfully marketable.

Many potential CRADAs never materialize because the financial risk is too great, and in 2002, a GAO report stated that managers at DOE laboratories most frequently cited the lack of dedicated funding for technology partnerships, including funding targeted to small businesses as the most important barrier to their technology transfer activities.

Moreover, they reported that managers at eight of 12 DOE laboratories we surveyed cited a lack of dedicated DOE funding for CRADAs as an important barrier that has constrained technology partnerships at their laboratories.

In developing this amendment we worked with committee staff and send draft language to DOE for technical comments. A number of their suggestions were included in this amendment. The language ensures that small businesses will be given special consideration in deciding which CRADAs will receive funds. We also authorized such sums as the Administration deems necessary rather than authorizing a specific sum.

This language does not prejudice the analysis of the new DOE Technology Transfer Coordinator, who is currently undertaking this endeavor to understand the resources necessary to optimize technology transfer and cooperative research efforts.

To summarize, this amendment will enhance the cooperative agreements between DOE national labs and small businesses, and in doing so will spur innovation, support small businesses, and create jobs.

I urge my colleagues to support this important amendment, and I thank you for your consideration. I yield back my time.

Chairman GORDON. Mrs. Biggert, I think you have a secondary amendment.

Mrs. BIGGERT. Yes.

Chairman GORDON. Well, before you do that I think Mr. Garamendi wanted to speak to it.

Mr. GARAMENDI. Thank you very much, Mr. Chairman. Mr. Luján, this is an extremely important aspect of what needs to be done. Our national labs are an extraordinary resource, and incredible technology potential exists at those labs. This is a tool that could be used by the Lab Directors and the Secretary in moving that technology, that innovation out of the labs.

I am working on an additional program with Mr. Luján that would allow the national labs to set up, adjacent to the laboratories, space that could be used in cooperative arrangements. Not funded directly by the labs but in these kinds of partnerships, some of which could be these CRADA Programs. That is an issue for another day that will be taken up in a separate piece of legislation.

But those facilities adjacent to the labs would provide the location for perhaps some programs that would be created under this amendment.

I support the amendment. I yield back my time.

Chairman GORDON. If there is no further discussion on the amendment, then I yield to Mrs. Biggert for a secondary amendment, and the clerk will report the amendment.

The CLERK. Amendment 103, amendment offered by Mrs. Biggert of Illinois to the amendment offered by Mr. Luján of New Mexico.

Chairman GORDON. I ask unanimous consent to dispense with the reading.

Without objection, so ordered.

I recognize the gentlelady for five minutes to explain her amendment.

Mrs. BIGGERT. Thank you, Mr. Chairman. I support the Luján amendment. I think that it will enhance the cooperative agreements between DOE national labs and small businesses and in doing so will help spur innovation, support small businesses, and create jobs.

But my amendment would prohibit the funding from the Office of Science from being used to pay for the federal share of cooperative research development agreements, and I certainly appreciate the concept behind Mr. Luján's amendment. Funding for these agreements certainly has diminished substantially in recent years, deterring labs from utilizing relationships with industry. I would like to see this change like Mr. Luján, but I think that it could use a little bit more work.

Specifically, I would like to see more emphasis on the research projects spread across all programs within DOE and perhaps we should include some oversight. I don't think that there is much in there, and then—and direction through the Tech Transfer Coordinator at DOE and not have the funding just come out of science but really through the programs and projects that are established within the Department of Energy.

And I hope that the gentleman would work with me to improve this provision of the bill and would yield back.

Chairman GORDON. And Mr. Luján, what is your opinion?

Mr. LUJÁN. Mr. Chairman, thank you very much, and I appreciate as well Mrs. Biggert's support for our national laboratories and the need for innovation, and I appreciate very much this amendment which I am not opposed to. I would be willing to work with Mrs. Biggert.

When we look at the section of the United States Code where cooperative research and development agreements were outlined and created, there is some enumerated authority that I think we could look to, Mr. Chairman, if there is further clarification that is needed. I think that it works well the way that it is, and I also want to make sure that as we look to the funding that goes to the Office of Science, that we are able to target that, to do exactly that work.

But on the other side we should work in a way where we can help accelerate the movement of the commercialization of this technology and the transfer of it so we can help get that out there and make sure that we look to strengthen these partnerships, which were strong in the 1990. They did well. There was a lot of positive work, but we need to make sure that they are strengthened yet again.

So thank you very much, Mr. Chairman.

Chairman GORDON. So as I understand it you are supporting this amendment, and if there needs to be some massaging, that you will work together as you go forward.

So if there is no further discussion, the vote is on the Biggert secondary amendment. Those in favor, say aye. Opposed, no. The amendment passes.

Now the vote is on Mr. Luján's amendment. All in favor say, aye. Opposed, no. The ayes have it, and the amendment is agreed to.

The next amendment on the roster is an amendment offered by the gentleman from Maryland, Dr. Bartlett. Are you ready to proceed with your amendment?

Mr. BARTLETT. I am, Mr. Chairman. I have an amendment at the desk.

Chairman GORDON. I have—the clerk will report the amendment.

The CLERK. Amendment 022, amendment to the amendment in the nature of a substitute offered by Mr. Bartlett of Maryland.

Chairman GORDON. I ask unanimous consent to dispense with the reading.

And without objection, so ordered.

I recognize the gentleman for five minutes to explain his amendment.

Mr. BARTLETT. This amendment, sir, is really a sense of the Congress. It very simply reaffirms that the purpose of COMPETES is the intent by the Congress to implement the top ten actions in priority order of the National Academy of Science's 2005 Report, *Rising Above the Gathering Storm*. This amendment states that these top ten actions remain critical to maintaining long-term U.S. economic competitiveness and accordingly shall receive funding priority.

As a reminder, the *Gathering Storm* Report was very specific in its recommendations, focusing primarily in two areas of research and stem education.

Recommendation A, increase America's talent pool by vastly improving K through 12 science and mathematics education, and B, recommendation B, sustain and strengthen the Nation's traditional commitment to long-term basic research that has the potential to be transformational, to maintain the flow of new ideas that fuel the economy, provide security, and enhance the quality of life.

Most of the funding increases that we called for in the original COMPETES Act have not yet materialized. The sense of the Congress amendment supports efforts to redouble efforts to see COMPETES' original prioritized recommendations realized.

And I thank you and yield back.

Chairman GORDON. Thank you, Mr. Bartlett, for a good amendment.

If there is no further discussion, those in favor of the amendment, say aye. Opposed, no. The ayes have it. The amendment is passed.

The next amendment on the roster is the amendment offered by the gentleman from Georgia, Dr. Broun. Are you ready to proceed with your amendment?

Mr. BROUN. Yes, Mr. Chairman. I have an amendment at the desk.

Chairman GORDON. The clerk will report the amendment.

The CLERK. Amendment 023, amendment to the amendment in the nature of a substitute offered by Mr. Broun of Georgia.

Chairman GORDON. I ask unanimous consent to dispense with the reading.

Without objection, so ordered.

I recognize the gentleman for five minutes to explain his amendment.

Mr. BROUN. Thank you, Mr. Chairman. The amendment would maintain consistency throughout many federal programs by prohibiting any funds authorized by this COMPETES authorization to be used by—to be used for any lobbying activities to influence in any manner a member of Congress, a jurisdiction, or an official of any government.

We do not want any recipient of appropriated funds by this reauthorization to use these funds in any way that is not consistent with the stated intent of any specified program. Failure to adopt this explicit lobbying prohibition could open up a Pandora's box of improper influence towards government officials with the very funds the government has appropriated to them.

This amendment is simply a good government effort, and I urge the Committee to support this amendment.

Thank you, Mr. Chairman. I yield back.

Chairman GORDON. Thank you, Dr. Broun. I certainly agree with the intent of your motion and will support it.

I want to put one caveat. Again, there may need to be some tweaking later on. I want to be sure that if Mrs. Biggert were to go by the Argonne National Lab and ask for some advice or ask about this or that, that there wouldn't be a problem about them, you know, responding to her.

But certainly the spirit of where you are going is where we all want to be.

Mr. GARAMENDI. Mr. Chairman.

Mr. BROUN. Certainly, Mr. Chairman—

Chairman GORDON. Governor, you are recognized for five minutes.

Mr. GARAMENDI. Following on what you just opened up the conversation, Mr. Chairman, some of this money is going to be used in a variety of ways, from grants to loans to loan guarantees to research going on at universities and hubs. I mean, it covers pretty much an encyclopedia of projects and research.

It appears as though this language would prevent communication to us about what they are doing. If that is the case, this shouldn't be done. We should not pass this amendment. We need to know what they are up to. They need to be able to communicate to us what they are doing. We just went through the automobile issue here a moment ago. What are those research facilities doing? If they send us an annual report, that is an expenditure of money that could be deemed to be influencing us about the merits of that particular project.

Now, with regard to federal employees and federal agencies, there are many laws already in place that prohibit the federal agencies from using their money to lobby us. I remember one of my colleagues getting in deep trouble in the '90s about that. So I am concerned about this, and the way it is written lobbying and influencing and informing and blah, blah, blah, I don't think we want to do this.

I yield back.

Chairman GORDON. I think that this is a somewhat standard concept in a variety of parts of legislation, but then, again, I think we just need to make sure that this is consistent with what is going on elsewhere and doesn't run into those problems that you mentioned in terms of, again, the advice that we might want to get.

Dr. Baird, you are recognized.

Mr. BAIRD. Mr. Chairman, thank you. Two things. One, I very much associate myself with the remarks of Mr. Garamendi. You know, if you, as many of my colleagues do as well, follow the business literature, in business there is great concern about top-down management, about a structure that says the guys on the bottom, so to speak, can see something happening, but they can't talk to the top.

Well, it is one thing to lobby in the sense of self-interest, like I want you to give more money to me because I want more money for me.

But it is quite another thing to lobby in the interest of the people that are public employees and others that serve just as we serve. If you see a better way to do something, I think you ought to be able to tell Members of Congress that without running afoul and possibly facing criminal prosecution.

So on the premise I have a real problem with overly restrictive restriction on this. I mean, it creates—I think it really creates a bind on behalf of well-intentioned public employees who say, I actually think we can do this better, but have no way of legally of telling a Member of Congress that without running risk of this.

Now, the second point I would make is, as Mr. Garamendi correctly pointed out, there are existing laws 18 USC, Section 1913, actually encompasses, verbatim as far as I can tell, the language of Mr. Broun's amendment up to a point. And then Mr. Broun's amendment leaves out certain language, and I am going to—I will read the language that it leaves out, and the language it leaves out is substantive.

So if you stop in Mr. Broun's amendment, the actual, original statute reads, "but this shall not prevent officers or employees of the United States or its departments or agencies from communicating to any such Member or official, at his request, or to Congress or such official, through the proper official channels, requests for any legislation, law, ratification, policy, or appropriations which they deem necessary for the efficient conduct of the public business, or for making any communication whose prohibition by this section might, in the opinion of the Attorney General, violate the Constitution or interfere with the conduct of foreign policy, counter-intelligence, intelligence, national security activities, et cetera."

Now, the question for me is, if we have that law on the books, why is that not included? And maybe it is just an oversight, but that protection of well-intended public officials speaking out in the best interest of the public ought to be in there. That is the existing generic law, and I am puzzled as to why it is not—and Mr. Broun, I would be happy to yield for—to Mr. Broun for an explanation if you can offer one.

Chairman GORDON. Maybe I could suggest, if you don't mind, Mr. Broun, why don't we defer this and let us try—as I say, I think no

one will disagree with your intention, but I think if there is some established language that you might be better off using that well-established language. So if you don't mind, this can be discussed a little bit longer, and we will try to deal with it when we go to the Floor.

Mr. BROUN. Well, Mr. Chairman—

Chairman GORDON. But, I mean, if you have a different opinion, that is perfectly fine.

Mr. BROUN. Will you yield?

Chairman GORDON. Certainly.

Mr. BROUN. Okay. Thank you, Mr. Chairman. I appreciate you yielding.

The intent is—let me explain the intent in Section 24, Subsection B, duties of the Office of Innovation and Entrepreneurship. I am reading from the bill. “Shall be responsible for,”—paragraph one. It says, “developing and advocating policies.”

In the amendment there is a very clear definition put in place in this amendment, and I will be glad to read it. You can look at it right there in the—in Subsection—in Section B, Subsection B of Section 701, prohibiting lobbying, and the amendment very clearly defines what we are trying to do, and it is—I would love to work with the Chairman, I would love to work with anyone else on the other side, because I think that your concerns about communication and things like that and suggestions of better ways to do things, certainly I am in favor of those.

But I just—I think we have a clear-cut definition of lobbying, and Mr. Chairman, if you all would accept the amendment, let us pass it, then I would be glad to work with the other side to do what we can—

Mr. WU. Would the gentleman yield?

Mr. BROUN. Certainly, Dr. Wu.

Mr. WU. Mr. Broun, if I may, just cutting to the chase of the statutory language which Mr. Baird cited, the most important exemption there is that the prior statutory language of that other provision allows us as Members of Congress to ask a question of Executive Branch officials and permits them to answer the question as asked. And that exemption is missing in your proposed amendment, and I think that that is a very, very important exemption.

When we ask questions, folks in the agencies, to the extent that they are permitted by their higher ups, if you will, within the Executive Branch, ought to be able to answer those questions without fear of a statutory provision. I think that is very, very important.

I would be happy to yield back.

Mr. BROUN. Well, thank you, sir. I appreciate it, Mr. Wu, and I agree. We—I want to ask questions, and we have to hold them accountable, and they should answer the question, and I would be glad to add clarifying language as we proceed forward. Hopefully we will accept this amendment and get the clarifying language in the final report.

Mr. BAIRD. Mr. Chairman, I would not be inclined to accept the language as is. I might be willing to accept it if we offered the remainder of the statute, US—18 USC Section 1913, as a secondary amendment. Under that case I would, but I think there are huge

unintended consequences to the amendment as written, and I couldn't support it without a secondary amendment.

Chairman GORDON. Mr. Grayson hasn't had a chance to speak.

Mr. GRAYSON. Thank you, Mr. Chairman. The first amendment gives every American the right to petition the government to address his grievances, and I am concerned that this amendment to this bill as written denies Americans that right.

I want to point out that in the language circulated by Dr. Baird, the specific recognition of the fact that we can't restrict speech. That would violate the Constitution. We can't restrict speech in a manner that would violate the Constitution. I see nothing in the Broun amendment that respects that very fundamental principle, and I am concerned that the Broun amendment as written is unconstitutional.

I yield the remainder of my time.

Mr. DIAZ-BALART. Mr. Chairman.

Chairman GORDON. Mr. Diaz-Balart.

Mr. DIAZ-BALART. Thank you, Mr. Chairman. Actually, if I can address my question to Mr. Broun.

Mr. Broun, I just want to make sure that I have been hearing the same thing that everybody else has. You said that you are willing to make sure that your amendment is corrected through the process to make sure that all those issues are resolved with. Is that correct?

Mr. BROUN. That is correct. Yes.

Mr. DIAZ-BALART. All right. Mr. Chairman, with that, I mean, we do this all the time in this process, and you have been great at that, Mr. Chairman, where you will—we will have a discussion, and you will say, we will work with you, and we will accept the language, and move forward. I think we have a colleague here who says—and we all—we have heard today that everybody agrees with this concept, and he is willing to work with everybody to make sure that all of those issues are resolved, so I don't know what the big issue—if the sponsor of the amendment says he wants to resolve these issues, the Chairman of the Committee, who controls the Committee, can sit down with him and work out those issues, I am not quite sure what the big problem is here.

I yield back.

Chairman GORDON. Well, I think there are a couple of ways—another way to approach this is, again, that in essence this could be made in abeyance and let both sides work together and then come forward with something. I think that is going to make folks over here more comfortable.

Mr. BROUN. Mr. Chairman.

Chairman GORDON. Yes, Dr. Broun.

Mr. BROUN. I would be happy to accept a secondary amendment from Dr. Baird if he wants to present one or I would rather do that and actually get some lobbying prohibition put in place, but I would be glad to work with the Chairman as well as others on the other side to try to straighten this out. I just want to—would like to go forward with some lobbying prohibition. I certainly don't want to stop any dialogue between members of this committee or anybody with any part of the Administration.

So I would be very happy to work this out. I would like to see the amendment accepted and then let us work out the language in the final product if possible.

And I yield back.

Chairman GORDON. Okay. All right. The problem we are going to have to get the secondary amendment, we are going to have to get it printed up, walked through, and it is just going to take us awhile. So I think we are going to have to, with unanimous consent, move your amendment to the back of the amendments, see if they can come up with their printing, and if they can do it, we will go forward. If they can't, then we will just—either you can have a vote on yours or we will hold it and wait and try to work it out later.

Mr. BROUN. Mr. Chairman, if I have your assurance, because I have the utmost respect and confidence in your word, if you will assure me that we can work out this language and get it in the final product, I will withdraw and defer to you. If I can have that assurance from you, sir.

Ms. EDWARDS. Mr. Chairman.

Mr. BAIRD. I think Ms. Edwards wants to be recognized.

Chairman GORDON. Ms. Edwards is recognized.

Ms. EDWARDS. Thank you, Mr. Chairman, because I actually really do have some concern. We have talked a lot in this committee about consistency, and I worry when you take part of a provision like this, well-intentioned, I think, Mr. Broun, when you don't take all of it where there are already criminal sanctions available, and then single this out for a specific lobbying prohibition.

Does that mean that every time we want to prohibit lobbying with appropriated funds, rather than going back to the code where there is an overall prohibition, that we would have to create that? Because I actually think that that in itself creates a legal problem. So in one part of the code and one section you would have a prohibition, but then in another, not, and the fact is that there isn't underlying prohibition on using appropriated funds to lobby.

And there is—you know, before coming into Congress I spent a fair amount of time, about 10 years, working on lobbying prohibitions. And the idea behind putting lobbying prohibitions across the board when using appropriated funds is specifically so that we don't have to come in every single committee, in every single piece of legislation and worry about whether we have interfered with that prohibition.

And so I don't—actually, one, I think we could use some advice from counsel because I am actually not certain that this provision frankly is even necessary given the state of the law as it is, and I would like some clarification to that before I would go forward.

And I yield just briefly to Mr. Rohrabacher.

Mr. ROHRABACHER. So your position is that this is already illegal across the board to use government grants to lobby us. So that is your position, which seems to be in contrast to your colleague's position that such a restriction is unconstitutional in some way.

I guess that type of inconsistency on that side of the aisle is what maybe—

Ms. EDWARDS. Well, if the gentleman would—

Mr. ROHRABACHER. —Dr. Broun was trying to clarify.

Ms. EDWARDS. I would like to reclaim my time. There is no inconsistency at all because the lobbying prohibition that exists has an exclusion for the Constitutional issues that have been raised, and so there is no inconsistency. Where the inconsistency would be is if the—if we in this committee pass a lobbying prohibition and we don't do it anyplace else, and then it raises into question whether that underlying provision prevails or whether this one would, even when it has the same or similar language.

And so I would beg for this committee to exercise a little judgment of consistency and conformity and understanding, and speaking as somebody who has raised a lot of federal money and worked with it and had to sign off on those prohibitions, I know that people some are clear, and when they are not clear, they face criminal prosecution as is contained in the code already.

And so I believe that those lobbying restrictions with the appropriate constitutional exceptions are already in law, and I don't see any reason for this committee to replicate that.

Mr. BROUN. Would the lady yield?

Ms. EDWARDS. I will yield, Mr. Broun.

Mr. BROUN. Thank you, Ms. Edwards. We are putting in place in this bill the Office of Innovation and Entrepreneurship. We are charging it directly with the responsibility of advocating policies.

It is against the law to lobby, but we are charging this office to lobby if we don't clarify that, and that is the reason that we have the necessity of this. This is to maintain consistency. I want to work this out so that we do maintain consistency, but we are charging in this bill for this Office of Innovation and Entrepreneurship to advocate policies, and I am just very, very concerned about that because what—

Ms. EDWARDS. Well, let me reclaim my time, because a plain English definition of advocacy is not, in fact, the same thing as lobbying, and the law that is in place would apply to the use of any appropriated funds for lobbying as already defined with criminal sanctions that are available.

And so I just—one, I don't see the necessity to it, and I think if you were—if we were doing anything, we would simply refer back to the underlying law that already has criminal sanctions and includes the Constitutional exceptions.

And with that—

Mr. BROUN. Would the gentlelady yield?

Ms. EDWARDS. —I yield my time.

Mr. BROUN. Would the gentlelady yield back?

Chairman GORDON. I suspect that Mr. Inglis would like to yield you some time, Dr. Broun.

Mr. INGLIS. Yes, Mr. Chairman. I was thinking of doing that. I would be happy to yield to the gentleman from Georgia.

Mr. BROUN. I thank the Chairman, thank my colleague from South Carolina.

I would like to ask Mr. Edwards to define advocacy so that we can have it plain and clear. I just want to be sure that we don't have this federal entity charged with lobbying with—and I want some consistency throughout the government, and what we seem to be doing and my concern is that we are charging this federal agen-

cy, the Office of Innovation and Entrepreneurship, to do what is blatantly untenable under federal law.

So the whole intent of this and what I have offered to do is to try to clarify the language with my colleagues on the other side and am eager to do so. I am very well aware of the first amendment and what it says, and I am very well aware that we need to have the ability to ask people in the Administration questions about what they are doing, and we need to hold them accountable.

And I am eager to try to work this out so that the way the bill is written right now today, it appears to me just through the plain, commonsense language, and I am a commonsense language person, the bill charges the Office of Innovation and Entrepreneurship in advocating policies, which is lobbying.

Now, if there is a difference between lobbying and advocating policies, I would like to know it, but—and I would like to just work this out so that—and I am eager to do so. Very eager to do so so that we can all be satisfied, and if we could do that, I would like to proceed forward.

Mr. Chairman, I yield back.

Mr. GRAYSON. May I inquire at this point? I know the gentleman yielded back, but perhaps he would like to un-yield his yielding so that I could ask him a brief question.

Mr. BROUN. I have already yielded back.

Chairman GORDON. Well, let me make this suggestion. I think we are all seeing the same—I hate to use the word “wreck”, but the same incident, but we are seeing it a little bit differently. I think a lot of this is definitions, and so this really is somewhat first experience in terms of going through this for many of us right here. I just don’t see how we can come to a conclusion today.

Again, I would hope that the two of you—that all of us will work together for common language. I cannot guarantee you, you know, I can only guarantee you there will be an effort to work together. That is, you know, so that is where we are, and I think we either need to vote or, you know, move on, because I think we have got to sit down and really talk about this and look at more what the precedents are.

Mr. GRAYSON. Will the Chairman yield for a brief comment?

Chairman GORDON. Yes, certainly, Mr. Grayson.

Mr. GRAYSON. Thank you. I just want to suggest that we might be able to resolve this by substituting a different amendment that says where the bill refers to advocacy simply adding the words “but not lobbying”. If we add an amendment that says advocacy and then added the words “but not lobbying”, I think that would address the concerns stressed by certain people on this side of the aisle.

Chairman GORDON. Governor.

Mr. GARAMENDI. Mr. Chairman, I think a question to counsel might help us here. Are there in the federal codes laws that define and restrict lobbying activity with the use of federal money?

COUNSEL. We are not aware of all possible references but we do know that 18 U.S.C. Section 1913 includes a blanket prohibition on the use of any money appropriated by any enactment of Congress to be used directly or indirectly for these sorts of things we are talking about.

Mr. GARAMENDI. So at least in one code section this issue is already handled. Unless we provide explicit authorization, otherwise that code section would apply, is that the case?

COUNSEL. It applies to any enactment of Congress.

Mr. GARAMENDI. I think this may have already been covered. Perhaps a way of dealing with this without having to really get into what is I believe to be a Judiciary Committee matter, is that it might be useful simply to reference existing codes, and that is a question to counsel. Could this be dealt with that way, or it may not even be necessary to do anything?

COUNSEL. It could be.

Chairman GORDON. I guess the question, it can be done that way. Whether it can be done—whether we have to get a new amendment or just what the process is, but Dr. Ehlers is recognized.

Mr. EHLERS. Thank you, Mr. Chairman. Let me just observe. You have been the Chairman for some time, and I have always admired the way you have resolved these difficulties simply by asking the parties to get together before the next meeting or before it appears on the Floor or whatever and resolve the problem, and it has worked very well every time. You are very fair in bringing people together and dealing with the issues of bringing out the facts. I think what we are trying to do or have been trying to do here for the last 45 minutes is write new law with 30 people with different memories and different opinions. So my suggestion is that you just do it the way you have normally done it which has worked very well and just ask that we defer this and you appoint a group of people to resolve it and bring it back to us whether it is in this committee or whether it is through a Floor amendment, the Rules Committee or whatever.

But you have done that so well in the past. I think we wasted a lot of time here and something that you normally resolve very quickly and I urge you to do that.

Mr. BROUN. Would the gentleman yield?

Mr. EHLERS. Yes, I will be happy to yield.

Mr. BROUN. I thank the gentleman's comment. The Chairman and I have been trying to do this for 10 minutes now, and I have utmost respect for the Chairman. We have done this very amicably in the past, and I assume that we can do so. And if we could just reference Title 18 to make sure that we do this, I am fine with that. And I suggest that I withdraw the amendment, that we work this out. And I have already gotten the Chairman's assurances that we will try to work this out. And I repeat, try to work this out.

And I believe in my heart that we can with my concerns and the concerns on your side so thus I withdraw the amendment. We will move forward.

Chairman GORDON. Thank you, Dr. Broun. And let us don't mess it up. Let us take it and go.

Mr. LUJÁN. Mr. Chairman, if I just may, I think it is important. Just leaning back to what Ms. Edwards said, I think that as we work this out that it is important that if we are going to refer to this particular U.S. code that we refer to every U.S. code that deals with discrimination, employee rights, and safe working environ-

ments because if we are going to do this, I just hope that is taken into consideration, Mr. Chairman.

Chairman GORDON. I think as we go from here to the Floor, we will try to take everything into consideration and have a fair resolution. The amendment is withdrawn. The next amendment on the roster is an amendment offered by the gentleman from Texas, Mr. Hall. Are you ready to proceed with your amendment?

Mr. HALL. I am. I have an amendment at the desk.

Chairman GORDON. The clerk will report the amendment.

The CLERK. Amendment 022, time stamped April 26, 2010, 5:26 p.m. Amendment to the amendment in the nature of a substitute offered by Mr. Hall of Texas.

Chairman GORDON. I ask unanimous to dispense with the reading. Without objection, so ordered. I recognize the gentleman for five minutes to explain the amendment.

Mr. HALL. Mr. Chairman, the bill before us today in one way or the other creates, expands or modifies a variety of grant programs of NSF, DOE and NIH for the institutions of higher education. My amendment accomplishes simply one thing, just one thing. It adds a section at the end of the bill which for all activities and programs supported by this Act and amendment made by this Act gives institutions of higher education that serve students with disabilities like Gallaudet here in Washington or those serving disabled veterans like Mount Wachusett Community College in Massachusetts the same special consideration given to other institutions that serve populations under represented in STEM so that they too can benefit from those programs and contribute their competitiveness.

This language is very similar to a provision already in NSF title of the bill. The only difference is that I am applying it to all of the titles of the bill and also adding those schools that serve disabled veterans for adding those schools that serve disabled veterans to the list. I know all of us appreciate the tremendous sacrifices our veterans make for the nation. I hope my colleagues will join me in support of this amendment.

Chairman GORDON. Thank you, Mr. Hall. The Chairman recognizes himself. We certainly share the spirit of this and the recommendation that was made by the Committee that recommends outreach for minorities, women, and disability, made the specific recommendation of those charter schools. The concern that I have here is that by—this is such an expansion that it covers everywhere where it makes nobody special in this regard. If they are serving disabled veterans, that could very well mean that if they are in compliance with ADA [Americans With Disabilities Act] and you have a veteran there, which virtually every university will have, then you are opening it up to say every university is treated this way, which really reduces the benefits to Gallaudet and to those other schools. So I think your intention is good, but I am afraid that the expense is too large.

Mr. HALL. I am not sure that expense can be too large for disabled veterans. There are 3.1 million vets receiving disability compensation. Only around 280,000 of them are rated as 100 percent disabled. I am willing to relegate it some way where it doesn't open—

Chairman GORDON. Well, I think, Mr. Hall, the distinction, this is not for the disabled veteran. It is for the institution, and so that is—I think you have another amendment that provides priority for veterans in terms of scholarships.

Mr. HALL. Right.

Chairman GORDON. And we would certainly agree with that. This is not aimed at giving the disabled veteran a benefit. It is the institution that the disabled veteran might attend and that is going to be in all institutions.

Mr. HALL. They may be paid for it, but the disabled veteran would be the recipient of the treatment. It would open—if that opens the flood gates maybe we ought to open the flood gates.

Mr. ROHRBACHER. Mr. Chairman, the reading, apparently it says institutions of higher education chartered to serve large number of students with disabilities, and there is a quantification there that does differentiate one institution from another. Maybe it needs to be more defined but that is some language.

Chairman GORDON. I think those are two different sections there, and again it is how you might interpret it, but again it goes to the institution, not the student or the veteran.

Mr. HALL. That is exactly true but the veteran receives the educational treatment that gives him a better opportunity to have a normal life.

Chairman GORDON. Well, not necessarily because it is whatever that institution may be getting the veteran might not be interested in.

Mr. HALL. Well, you know, a little Boy Scout helped a woman across the street and she didn't want to go might be the situation anywhere, but I think by and large the situation would be that the veteran would be benefitted from it. He would benefit from it by upping his skills at the educational market and have a better opportunity to come back and return to society however disabled they were. If you are disabled, you are disabled.

Chairman GORDON. That is why we would be supporting the next amendment that talks about the veteran specifically. As a practical matter, this is going to make every institution available so it is really no benefit to anyone.

Mr. BAIRD. Mr. Chairman.

Chairman GORDON. Yes, Dr. Baird.

Mr. BAIRD. Would this language—let me give an example and see if this suggestion will help and it may be already in there and I may be just reading it wrong. So not far from here we have got Gallaudet and there are institutions for the blind and there are others. Some subset of our veterans and institutions have particularly helped people with paralysis and lost limbs, et cetera. A subset of our veterans may attend an institution like Gallaudet. Maybe they lost their hearing. If we were to say veterans within institutions along the lines of what Mr. Rohrabacher was saying, that are specifically chartered to serve a large number of people with disabilities, so then—the veterans who fit that category benefit from being in such institutions. I think the Chairman's point is, insofar as every college and university in America ought to be serving veterans with disabilities, by opening it up to every college and insti-

tution, we are not targeting anybody. I think that is your point, Mr. Chairman.

So Mr. Hall's point, those veterans with disabilities who are attending institutions chartered specifically to serve large numbers of people with disabilities would benefit from this. So could we add or modify the language in that fashion?

Mr. HALL. We could take some modified language and I would recommend some modified language to you and will continue to work with you on it. We could say—well, of course, we refer to populations underrepresented in STEM so that they too can benefit. Disabled veterans are certainly an underrepresented population, and I think they certainly come under this, and if there is some way to relegate it population wise to each institution, I wouldn't be adverse to that. And we could put this where it says and those with programs serving disabled veterans or those who have large numbers of veterans shall receive special consideration.

Chairman GORDON. The problem is the amendment is sort of unspecific, and to serve the disabled if all—every school is going to abide by the ADA, and if they abide by the ADA, then by definition, they are serving the veterans so they are serving everybody.

Mr. HALL. Well, we are talking about yellow ribbon schools determined by the Department of Veterans Affairs potentially. But I think there is a way to do this and perhaps we tried to work something out here and have been unable to. I am not anxious to make anybody vote against veterans or disabled veterans. None of us want to do that, but we don't want to flood the market unnecessarily but it is hard for me to feel that if a veteran, a disabled veteran, can benefit themselves some education they receive though the school receives the money that that makes a lot of sense to me. I don't—maybe I am not opposed to flooding the market with those if there is that many out there that seek that type education. I don't think there would be.

Chairman GORDON. Again, it is not the individual. It is going to be the school and every school is going to be eligible so—

Mr. HALL. But they have to have a warm body.

Chairman GORDON. Well, there may be a school that doesn't have a veteran somewhere or a disabled veteran, but there won't be many.

Mr. BAIRD. Mr. Chairman, if I may.

Chairman GORDON. Yes, Dr. Baird.

Mr. BAIRD. I share, and I think we all share Mr. Hall's desire to try to help out disabled veterans. And, Mr. Hall, if there is a way, and I think that is what you are grasping at in saying if there is a way to target the help for the veterans rather than speak to the institution where the veteran happens to go to school because so many veterans are going to so many schools that the school benefits but the veteran themselves may not. And analogous—and it is not a perfect analogy—but analogous Ms. Bernice Johnson, she was able to target institutions because there are specific institutions chartered with specific missions.

It is harder to do it in the case of veterans but maybe there is a way we can revisit the intent of this, draft some different amendment so that, for example—let me give you an example. Let us suppose a chemistry department wants to participate in an effort in

a hub, let us say, and that chemistry department makes a particular element of its application that we are working with veterans. Then they are there but not just because a veteran happens to attend the school, and I don't know how to do that. I am sure we cannot do that in the time here, but that seems to be what we are shooting for here. And I don't know how to get there but that seems to be what we are trying to get at.

Mr. HALL. If we can't do that in the time here, and we have tried and apparently been unable to work out language that is agreeable to both sides, we can either vote an up or down vote on the bill the way it is or we can have some type of—the Chairman is fair. I don't say anybody here is unfair. No one wants to be unfair with the disabled veterans nor the schools that educate them nor the schools that benefit some by upgrading a potential disabled veteran's chances in the workaday world. Maybe we can work something out that protects it from—we have situations here, all samples of schools, with disabled veterans programs. The University of Idaho has Operation Education they call it, Arkansas State University, the Pride Center for America's Wounded Veterans, the University of Kansas, the Wounded Warrior Education Initiative Program. They have got programs for veterans all over. Michigan State has the MSU Disabled Veterans Assistance Program—

Mr. BAIRD. Mr. Hall.

Mr. HALL. Yes, sir.

Mr. BAIRD. What if we take that principle that you are working on here and said something like, wordsmithing here a little bit, but “priority shall be given to institutions who have demonstrated programs dedicated to increasing the involvement of disabled veterans in the STEM fields.” So the mere attendance at your institution doesn't qualify, but if your institution has gone out of its way and created a program to help disabled veterans participate in STEM education, then you get some priority. Maybe your language does that already, but I think that is what you are driving at.

Chairman GORDON. Ms. Edwards is recognized.

Ms. EDWARDS. Thank you. Thank you, Mr. Hall, and I have to tell you as the daughter of a disabled veteran, I always want to try to figure out with you what we can do for our disabled veterans. And I want to get to what the underlying I think issue is with the institutions that are chartered. And we have a number of disabled veterans, particularly coming back now from Iraq and Afghanistan, who have specific kinds of disabilities. They may have lost sight. They may have lost hearing. They may have TBI, traumatic brain injuries, that result in attention deficit problems.

And the institutions that are chartered are actually serving those particular populations, and so I think if we could work on some language that encouraged those institutions that we want to receive sort of priority or receive research funding to also include the service that they are giving to our veterans for those particular disabilities, then that would be really good because what is happening is that when veterans return with very specialized disabilities sometimes the majority institutions aren't really at a capacity where they can serve them.

And these institutions that are chartered to serve those specific disability communities would be in a much better position to do

that. And with the research partnerships then, you know, even some majority institutions where a person with a traumatic brain injury that may have attention deficit is just one in a number of the population. So I would like to see if we can work on some language that actually enabled the chartered institutions that are serving those disability communities to be able to qualify based on also their service to our disabled veterans community. And if you would agree, I would love to be able to work with you on the language that would get to those chartered institutions.

Mr. HALL. Thank you for your efforts and for your suggestion. I suggest that we voice vote this with the understanding that we work on this to find language that is agreeable to the Chairman and agreeable to those who advise the Chairman. I don't know how much time we would have to do that and when this will come to the Floor, but if we could work on this till that time, I would be willing to do that. Once again, I don't believe there is anybody on here that wants to vote against a disabled veteran under any circumstance no matter what the consequences are. I don't want to put you in that position. I don't want to be put in that position but there must be some way we could work this out that wouldn't flood the gates of any university, but I don't know why a university wouldn't want these. They are paid well—

Ms. EDWARDS. Mr. Hall, if you would yield for just one moment. If you look in Section 244 of the section "Institutions Serving Persons with Disabilities," after it says "the institutions of higher learning chartered to serve large numbers with disabilities" you could add in there "including disabled veterans, including Gallaudet University, Landmark College, and the National Institute for the Deaf" so that you actually get the veterans populations in those chartered institutions.

Mr. HALL. The only problem with that is there are disabled vets who aren't blind or deaf. What do you do with them?

Ms. EDWARDS. Well, the chartered institutions serve the blind, they serve the deaf. If you go to Landmark College because I had to do some studying up on Landmark College and the population that it serves is a wide range of disability communities across quite a swath of disability communities and not just targeted to the deaf or the blind.

Chairman GORDON. Mr. Rohrabacher, do you want to be recognized?

Mr. ROHRABACHER. Mr. Chairman, let us just note that what this is all about. Mr. Hall, who is one of our more distinguished veterans in this body, a veteran from World War II, has over the years championed the cause of veterans, especially disabled veterans. And now he is trying to add that category onto a list in this legislation that includes a list that says predominantly black institutions, tribal college and universities, Native Americans serving non-tribal institutions, Asian American, Native and American Pacific Islanders, Alaska Native serving institutions, Native Hawaiian serving institutions, Hispanic serving institutions. Now you tell me that all these other colleges don't serve Native Americans, they don't serve Hispanics, they don't serve blacks, but that is why they have to be designated here, but disabled American veterans don't deserve any of that consideration as all those other groups. Now this is—

Mr. BAIRD. Would the gentleman yield?

Mr. ROHRABACHER. Well, let me finish my point first. Look, obviously we want all Americans to benefit from any legislation that we pass. We have already gone through so we have come to the point where we are naming these groups, naming institutions that are designed specifically for those groups although we realize all colleges and universities have to serve all Americans, otherwise it is discrimination and it is against the law. But that didn't deter us from putting these names on the list, and I would suggest that our Ranking Member is doing a wonderful job for a group of people here and that we should not—he should not be getting this type of resistance.

Mr. BAIRD. Would the gentleman yield?

Mr. ROHRABACHER. I certainly would, yes.

Mr. BAIRD. I thank the gentleman. I want to be really clear. I spent a great deal of my time helping disabled veterans. I have a doctorate in psychology. I work with brain-injured veterans. I am passionate about this. I spent a lot of my life on it. Ms. Edwards talked about her own father. We are trying to help here. Let me explain, if I may. It is your time but our concern is, precisely, Mr. Hall wants to help disabled veterans. We all agree with that and he has acknowledged that. Our concern is the way the bill is written it is so broad that the veterans themselves may not benefit. We are trying to say, let us write it in such a way so that the veterans benefit and not just any institution that happens to have a veteran at it.

Mr. ROHRABACHER. Okay, but reclaiming my time. For example, they defined Hispanic Serving Institution. If only 25 percent of the student body is Hispanic, it becomes a Hispanic serving institution. You know, if we are talking about thresholds here, let us talk about thresholds, but the fact is this is a principle that we are trying to get at, and I don't think it is going to cause the dislocation that this resistance to Mr. Hall's amendment seems to be bringing forth. We are only talking about special consideration here. That is all we are talking about. And I think these disabled veterans, maybe all veterans, but especially those people who are disabled deserve special consideration.

Mr. BAIRD. Would the gentleman—nobody on our side has said a word about worrying about whether funding is going to be dislocated from somewhere else. We are actually quite the contrary. We are not resisting this because—we are not resisting it. Let me start there. There is no resistance from our side, zero, to the intent of this amendment, zero that I am hearing. What we are trying to say is let us write it in such a way that it actually helps the targeted population. And I hope my friend is not trying to set up a—I don't think he is because you are a good friend, I don't think you are trying to imply that, oh, gee, those Democrats were eager to help all sorts of minorities but when it came to veterans they dug in their heels. Quite the contrary. What we are trying to do is say if you want to help veterans let us write language that definitely helps the veterans, not the broad institution that a veteran may happen to attend but the veteran gets none of the benefit.

Mr. ROHRABACHER. Reclaiming my time just so you know. I do not automatically think that every time we come up with some-

thing or you come up with something that sounds like it would resonant in the public that it is politically motivated. And, as I say, I don't know anybody else who is more respected in this Congress for the service that he has given our country than Ralph Hall, and he is trying to do something good here and it just seems to me we have reached—all these other situations where we are, yeah, sure, okay, native serving institution, fine. We didn't worry about defining it in a way even though Native Americans go to lots of institutions.

Chairman GORDON. If the gentleman would yield. I think what we are trying to stop is this. We are trying to stop what you might call an unethical school or a school that wants to parade out or recruit one disabled veteran in a 50,000 school to try to get some kind of preference. What we would like to get to is a school that provides some type of special training for a large number of veterans. We are trying to get it to the veteran, not to the school.

Mr. ROHRABACHER. Mr. Chairman, just about every legislation that we pass, if you try to find a provision you can carry it out to where somebody can manipulate it. Almost every piece of legislation we pass, there is a way for someone who doesn't want to go with the spirit of it to take advantage of it. And the spirit of what Ralph Hall is trying to do here is clear, and it is just as clear as those servicing Hispanic institutions which are in here, and I am not opposed to that. But, anyway, we can make that argument just about anything that we bring up that there is somebody who can actually manipulate it in a way that it wasn't intended.

Mr. BAIRD. Mr. Chairman, it is because of my profound respect for Mr. Hall that I am trying to be helpful here and I think that is the case with my colleagues. We are sincerely trying to make sure the money goes—I have been in institutions. I taught there. And Mr. Hall gave a great list of deserving institutions that have created specific programs to help veterans get into STEM, so that is why I said let us make the language not just that you serve a veteran because serving a veteran means you give somebody a class. They get a GI bill. They come in, you give them a class, but there the hell with them. You don't care about them. That is not going to help the individual. It may help the institution. They say, oh, look, we got a veteran here, give us money.

What Mr. Hall wants to say is make sure the veterans get into the STEM opportunities 100 percent right, and it is because I respect him that I agree with his intent, don't disagree with it at all. I just think the language as written is overly broad and if we can focus it, it will actually do what he wants in a better way. So this is because we respect Mr. Hall and our veterans that we are trying to help. I actually concur with Mr. Hall. I think we ought to voice vote it, pass it, and then work with him to try to improve it and make sure it gets to the people he wants it to get to. I actually agree with that.

Mr. HALL. And I say that that is agreeable. I don't disagree with that, and I respect the gentleman and everyone here. I respect the Chairman enough to believe that we will be able to write around it to where it would be acceptable and not detrimental to the universities nor detrimental to the veterans. And if we voice vote it,

and if that voice vote is aye, then I will feel a lot better toward the opportunity of working it out.

Chairman GORDON. I think Mr. Grayson would like the last word and then we will go to a voice vote.

Mr. GRAYSON. Rather than talking about this in the abstract, I am looking at the language and I just would like to get a chance from Mr. Hall about how it might apply to specific instances. That will give me some idea of exactly what we might be buying into through a voice vote. This provision says that there are three classes of institutions that get special consideration. One is institutions chartered to serve large number of students with disabilities. The second one is institutions with programs serving disabled veterans. And the third one is institutions that serve disabled veterans.

I just want to get a general sense of how you think that should work in practice, and I honestly, listening to the debate, don't have that yet. So if Mr. Hall would be so kind, we will just pick an example. Let us say a large undifferentiated institution not specifically targeted towards veterans like, let us say, the University of Southern California. Can Mr. Hall please tell me if he contemplates, would an institution like USC be one that is chartered to serve large number of students with disabilities?

Mr. HALL. They may not have a described program but they probably would have a lot of such veterans there and need in that area. I would even listen to limiting it to 10 percent of the student body of the institution that they apply to.

Mr. GRAYSON. Well, I think a numerical limit would be—

Mr. HALL. There is a right way to work this out I think if we had time to work it out. And I would feel good if we voice voted this and then agree to work it out.

Mr. GRAYSON. All right. Reclaiming my time just to work this through and get a sense of what you have in mind, and I do think a numerical limit would be extremely helpful here. Again, returning to a specific example, let us say USC again. Would Mr. Hall contemplate that USC be an institution with programs serving disabled veterans and, therefore, qualifying for the special consideration under the amendment?

Mr. HALL. Yes.

Mr. GRAYSON. All right. And would USC also be an institution serving disabled veterans and, therefore, qualifying for special consideration?

Mr. HALL. I would consider that.

Mr. GRAYSON. All right. It sounds to me that—reclaiming my time. It sounds to me that the Chairman's point actually is well taken and if USC qualifies under this provision essentially every college or university in the country might, and, therefore, I am concerned that this provision is overly broad. I do understand what I think Mr. Hall is trying to accomplish here, and, as Dr. Baird has said, I agree with it, but I do have the Chairman's concern that this language includes potentially every college and university in the country without any limitations. I am sorry to reach that conclusion but based upon what I have heard, that is my conclusion. I yield the rest of my time.

Chairman GORDON. Okay. If there is no further discussion, the vote is on Mr. Hall's amendment. All in favor, say aye. Opposed,

may. The ayes have it, and we will continue to work on the attention that everyone wants, and that is to help those disabled veterans.

Mr. HALL. Thank you, Mr. Chairman, and I thank the gentlemen who have made the suggestions, and we will remain willing to work something out that is reasonable.

Chairman GORDON. You are the one that made the suggestion. The next amendment on the roster is the amendment offered by the gentleman from Texas, Mr. Hall. Are you ready to proceed with your amendment?

Mr. HALL. I do have an amendment at the desk.

Chairman GORDON. The clerk will report the amendment.

The CLERK. Amendment 024, amendment to the amendment in the nature of a substitute offered by Mr. Hall of Texas.

Chairman GORDON. I ask unanimous consent to dispense with the reading. And without further objection, so ordered. I recognize the gentleman for five minutes to explain his amendment.

Mr. HALL. Mr. Chairman, this amendment could be considered as a companion to my previously offered amendment, the previously passed amendment, and also affects the whole bill. The last amendment partially deals with institutions of higher education with programs for disabled veterans. This amendment speaks specifically to scholarship and fellowship programs offered in this Act. It simply states that when awarding scholarships and fellowships a school "shall give preference to veterans and service members." including those serving in Iraq and Afghanistan. Many of these young men and women return home and either begin or continue their college education, often times after receiving quite a bit of on-the-job training in a variety of STEM fields. This positions them well for opportunities offered under this Act and they deserve preference if they are submitting quality applications. I hope my colleagues will join me in supporting this amendment.

Chairman GORDON. Thank you, Mr. Hall, and I think this is a good targeted amendment to the veterans themselves. Is there further discussion? Ms. Edwards.

Ms. EDWARDS. Mr. Hall, just to be really clear, I think this is a great amendment. I look forward to supporting it, and I thank you for your service.

Mr. HALL. And just to be perfectly clear, I think you are a wonderful member of this—

Chairman GORDON. So we are all clear and with no further discussion the vote is on Mr. Hall's amendment. All in favor, say aye. Opposed, no. The ayes have it, and the amendment is agreed to. The next amendment on the roster is the amendment offered by the gentleman from Texas, Mr. Neugebauer. I just mess it up every time, don't I? My friend from Texas, are you ready to proceed with your amendment?

Mr. NEUGEBAUER. I have an amendment at the desk.

Chairman GORDON. The clerk will report the amendment.

The CLERK. Amendment 069, amendment to the amendment in the nature of a substitute offered by Mr. Neugebauer of Texas.

Chairman GORDON. I ask unanimous consent to dispense with the reading. Without objection, so ordered. I recognize the gentleman for five minutes to explain his amendment.

Mr. NEUGEBAUER. Well, I am thinking about just yielding my time to the Ranking Member because he is on a roll here. Mr. Chairman, thank you. You know, we started this discussion earlier today, and it has been a long day, but I think we have to understand that we are dealing with, you know, some unprecedented times in our budget and in our deficits. We are talking about a deficit that this year could be \$1.3 to \$1.7 trillion, and that is a lot of money. In fact, if you have to count to a trillion dollars, it takes you 29,000 years if you started counting with 1, 2, 3. As I travel across my district, and I know Members go back to their district, and just came off of a recent recess and speaking to groups. One of the questions I have been asking the people that I represent, you know, to raise their hand how many people in this room, you know, are living a better life than their parents, and almost every hand goes up in that room.

And then I ask them how many people in the room believe that their children and grandchildren will live a better life than they will if we continue down the road here of spending money that we don't have and charging it to our children and grandchildren. And you know what is sad very few, if any, hands go up. So this is something that is not just rhetoric that should be spoken here in Washington, D.C. but this is what the American people all across this country are thinking about.

And they are looking to us, the people that they have elected, to manage the affairs of this country to do something about it, and so my amendment is very clear and until the CBO director can certify that we do not have a deficit that the spending levels under this bill would be frozen at the 2010 authorized amount. And basically that is the same budget that—that is the same principle that the American people live off of, you know. If they have more money, they are able to spend more money. If they don't have more money, they are not able to spend more money. And I think the American people are looking to the Federal Government to be able to handle their affairs just like I handle their affairs up here like they are handling them back home.

And so, Mr. Chairman, I think this is a common sense budget. I think all of us are committed to making sure that we move some of these programs forward. Maybe we are not able to afford to expand them at the rate that this bill does until such time as we do demonstrate that we are handling the affairs of the American people in a more appropriate way and the economy turns around and those jobs that we have been promised to actually finally show up and people get back to work and the economy starts growing again and tax revenues go up and maybe we get our pencils out and we sharpen them and we figure out ways to, you know, prioritize how we spend the American people's money, and maybe we have to cut some programs and maybe we increase some programs but what we do know is the direction we are going right now is for continuation of massive deficit, almost doubling the national debt in five years, tripling it in 10 years, and that is not sustainable.

Federal Reserve Chairman Bernanke recently said that a number of the President's cabinet members have said that these are not sustainable levels, and so the question is, when do you start doing something about that? And we can't say, well, this committee is not

going to do it until another committee is going to do it. I think we have to in every committee that we sit on be prudent about how we represent the American people's money and their affairs. And I think a good start here today is to say yes to this amendment because it makes sense. It doesn't gut the funding of the program. It just says it is going to be flat until we get back on our feet. With that, I yield back my time.

Chairman GORDON. Thank you. Let me—I think you really exhibited many of our concerns about the deficit, but let me put this in context. You talk about a family having to live within their means. Well, we are moving forward and the President is moving forward with a budget that is within the—Discretionary spending is flat, and so it is a matter of making priorities, and so there are other areas that are going to go down in an effort so that we can have priorities for investment that will pay off. And so this is within the context of that flat budget. It is just that many of us feel that this is an investment that will pay off.

I saw that recently. You can see it with Intel, with Microsoft. As they have gone through the tough times, they invested in the R&D and they have come out better for it at the end. So I certainly agree with you that we need to live within a budget, but we need to have priorities within that budget. And I yield back to the gentleman from Texas.

Mr. NEUGEBAUER. And I appreciate the Chairman saying that. I think one of the things we do have to understand is the President submitted a budget but this body has not passed the budget, and it is being represented by the leadership of the Majority that you may not present a budget to us, and so I don't know how we can actually go down that pathway of prioritization if we don't actually go down that pathway of prioritization and actually bring a budget before the House of Representatives so that we can have that debate and discussion and we have not had that. And so I appreciate what you are saying. I would love to have that debate and discussion but since we don't have that blueprint in front of us, you know, I think this is a direction that at least says, you know, we are going to hold the line here. Hopefully, that catches on to some other committees. They said, you know, we are going to hold the line here. You know what, pretty soon we may actually start reducing our deficit, and I yield the gentleman's time back.

Chairman GORDON. Well, I hope someone will go under the line and we will see some that are actually cut so that we can have priorities. I will just remind everyone that you can't cash an authorization. This is not an appropriation. This is an effort by our Committee to try to demonstrate where we think there should be priorities. Is there anyone else that wishes to speak?

Mr. BROUN. Mr. Chairman.

Chairman GORDON. Dr. Broun, you are recognized.

Mr. BROUN. Thank you, Mr. Chairman. I congratulate my friend, Mr. Neugebauer. I hope I got that right. I think I did. For submitting this amendment. I wish I would have thought of it or I would have had four instead of three. But I want to associate myself with what he said, and I think this is a very good common sense fiscally responsible amendment. And I have no illusions. We are not going to pass this, and I don't think Mr. Neugebauer thinks we are going

to pass it either, but it is one that does make sense. Mr. Chairman, I wish we could control the appropriators with this committee and with this legislation. They seem to have a mind of their own and do whatever they want to whether it is authorized or not. But we have one committee. We can't affect other committees. We can't affect appropriators. And what we are doing if we were to pass this amendment, we would be telling the appropriators that we are just going to hold the line, hold the line until we get out of this budget deficit that is unsustainable and untenable for the future of our nation. So I do support the amendment. I congratulate Mr. Neugebauer for introducing it. I think it is one that make sense just from a fiscally responsible perspective, and it is something that unfortunately this committee is going to not do, and I don't think our appropriators are going to do the right thing either. I think we are going to see a continuation of deficits and debt created by this administration and by the leadership here in Congress. We have one opportunity to hold the line, and—with this committee, and this is an opportunity to do it. My previous amendment was an opportunity to do it. I wish my colleagues would join us in trying to be responsible to the taxpayers of this nation, would join us in trying to be responsible to our children, our grandchildren, and the economic future of this nation, because we are not being responsible. We are being very irresponsible, unresponsible, and this amendment is to try to hold the line and make us responsible as a government. I yield back.

Chairman GORDON. Mr. Davis is recognized.

Mr. DAVIS. Thank you for the opportunity to make a few comments, and before I get into my comments, I would like to say it has been a pleasure and a privilege serving on this committee with you, and we have a Chairman that kind of gets it kind of figured out and has an awareness in him and a soul within him that realizes without research and spending dollars in targeted areas, our nation will not be in the future what it has been in the past. But I want to talk a little bit about debt. I—as a kid growing up, I read a story about Rip Van Winkle. He went to sleep for a long time. Some of the folks in this Congress, and some of the advocates of holding the line on spending, must have gone to sleep about 1981. Because in 1981 we owed less than a trillion dollars—Ronald Reagan elected President, was sworn on January the 20th. On the 1st of January it was \$933 billion. Not a trillion, but 933 billion. And there was a lot of folks, not in this room necessarily, but a lot that were advocating, as they are doing now, that must have gone to sleep, because for the next 2 years, through the first Bush administration, we grew that debt to \$4.1 trillion, over \$3 billion in less than 2 years. And what did we buy with it? Not a single infrastructure did we invest in. But what was that first trillion dollars for? For four wars: WWI, WWII, Vietnam and Korea. An interstate system in this nation that gave us an opportunity to have the cutting edge, being on the cutting edge of economic development that made us the strongest, most powerful nation in the world economically and military-wise. We built every lake in this country that we have today before 1981. We built the Panama Canal and gave it them back to them in '79. Sent people to the Moon and brought them back, built the shuttles that we have today. Infrastructure

that we spent on, and less than a trillion dollars we had spent. Then over just 2 years we spent another \$3.2 trillion dollars, increasing almost—where were you then? Where I grew up, they say pigs get fed and hogs get slaughtered. Looks like the pig of the debt got fed quite well for about 2 years and became a fat hog. But we didn't slaughter it, we still let it grow. And through the Clinton administration, with Republicans in control of the House and Senate, we started reducing our debts and deficits. Four years without a balanced budget. We grew by about \$1.6 trillion during the Clinton administration, and we downsized government. Cutting taxes to downsize government, cutting spending downsizes government. And so when you cut taxes and let the debts continue to increase, you absolutely are cutting the throats of the future generations. We watched that happen. And then someone must have been asleep in 2001 when it let PAYGO expire. Because when that expired, what happened? We doubled our national debt. I imagine Rip Van Winkle had some nightmares during the eight years of the Bush administration, because we watched those debts just continue to grow and explode, double in eight years. So, my friends on both sides of the aisle, let us stop pointing fingers. It is okay to talk about facts, and what I have given you are facts. Look them up.

Mr. BROUN. Will the gentleman yield?

Mr. DAVIS. I am not through.

Mr. BROUN. Oh, okay.

Mr. DAVIS. You will have your five minutes in a minute. What happened? We cut taxes, and we didn't cut government. The American public was convinced that cutting taxes cuts government. That is not the case. I am for cutting taxes and don't like to increase them. We passed a prescription drug bill in 2003 and didn't pay for it. We are now, and our children will. I didn't vote for the health care bill that just passed, but it is paid for. It is not going to add to the deficits, according to CBO. You may have other figures otherwise. It is time we start paying, you are right, for what we have been doing. But shame on you for implying that all this just happened the last year and a half. The \$12 trillion we owe has collected over the last 30 years, of which six years of those, from '81 to '87, was controlled by a Republican Senate, and starting in 1995 through 2007, by a Republican House and Senate, and part of that by the Republican President. Maybe I am making political statements now. Let it be, if that is the case, but honesty is something that needs to prevail inside this chamber, inside this committee. And as we continue debate what is going on in this Nation, we do need to get a handle on it. And the move that was made just recently, about a month and a half ago, where we passed a pay as you go bill that said, even if the Republicans get control of this Congress, they will have to repeal it if they give tax cuts or increase spending. And that is the good thing about it. I yield back my time.

Chairman GORDON. Is there further—Mr. Diaz-Balart is recognized.

Mr. DIAZ-BALART. Thank you very much, Mr. Chairman. You know, a lot has been said. The pig was fed too well, and I agree with that. The pig was fed too well in the previous eight years. But you don't solve that by tripling that and defending tripling the debt

over what you criticize over eight years ago. Now, I am not here to point fingers, but what I think is fair, to be serious, is that we have two options here. We can say, you know, everybody else in Congress needs to cut spending, but we are not going to. We don't want to spend more. We want to cut debt, but let everybody else do it, not us here. You know, Mr. Neugebauer has given us a chance, and I want to thank him for that. He has given us a chance to put the taxpayers' money where our collective mouth is. This is not an issue of pointing fingers. This is an issue of are we willing to do our very small part to try to control spending in a very real way. That is all this is. Again, let us put the taxpayers' money where our collective mouths are. We have a chance to do that here ourselves today. Not to point fingers about eight years or this President or that President, us. We are the ones that do the budget. We are the ones responsible for spending, Congress is. We have an opportunity. So all the rhetoric, let it be put aside. We have an opportunity, because this gentleman has given it to us right now, to take a vote to put the taxpayers' dollars, their money, where our collective mouths are really loud most of the time on. Here is an opportunity. I hope we take this opportunity. Thank you, sir, for giving us the opportunity.

Mr. BROUN. Does the gentleman yield?

Mr. DIAZ-BALAR. I have three minutes. I would yield it to Mr. Broun. Thank you, Mr. Chairman.

Mr. BROUN. I thank my friend for yielding. And just in response to my friend from Tennessee, we are talking about the deficit, not the debt. I have been a strong critic of the spending that went on in the 107th, 8th, and 9th Congress. I think it is deplorable and absolutely unconscionable that the last administration created the debt that was created during that period of time. I wasn't asleep. I was practicing medicine in Georgia. And I would have been a fierce opponent, just like I am today, on all this deficit spending. I have introduced a balanced budget amendment of the Constitution. I think the Federal government should live within its budget, within the revenues that it receives, just like my State of Georgia does. But we are talking about the future. We are not talking about the past. We have got this great tremendous debt. Every taxpayer in this country owes \$117,000 as their part of that debt. We cannot continue spending money. And what we are looking at, and what Mr. Neugebauer's trying to do is to stop the bleeding. So we are looking forward, not looking backwards as my friend just did, and I don't criticize him for doing so. You and I are friends, sir, and we will continue to be friends. I am a great critic of deficit spending. PAYGO has been a joke. It has been a joke. We have violated PAYGO time after time after time in this Congress. With this Congress we violated PAYGO over and over and over again. The only way Obamacare is paid for is higher taxes that is going to kill jobs. It is going to kill millions of jobs in this country because of the higher taxes. We have people in my district, manufacturers as an example. I talked to a manufacturer that hires about 400 people in my district that says that he is going to have to lay people off because of Obamacare. And if we, God forbid, do pass the energy tax, it is—he is going to have to close up and go offshore, or go out of business. This Congress is creating debt far more than we have

seen in the past administration. I am not talking about the past administration. I am a great critic of the past administration and the past Republican controlled Congresses, because it should not have been done. But we are looking forward. We are looking forward to what is going to be the future. You cannot tax and spend and borrow your way to prosperity, and that is what this Congress is trying to do. Mr. Neugebauer has given us an opportunity to stop the bleeding. And so talking about people being asleep, I take offense to that, because I wasn't here. I wasn't asleep. I was a private citizen, and I was a great critic of all the deficit spending that was going on during that period of time, and the debt that was being created with that. So it is critical that we stop the bleeding. Mr. Neugebauer has given us an opportunity, and this committee has one opportunity to stop it. One opportunity, and this is it. And I yield back.

Chairman GORDON. All time has expired on that discussion. If there is no further discussion, then the vote occurs on the amendment. All in favor say aye. Opposed, no. The nays have it, and the amendment is—we will let the clerk call the roll.

The CLERK. Chairman Gordon?

Chairman GORDON. No.

The CLERK. Chairman Gordon votes no. Mr. Costello?

Mr. COSTELLO. No.

The CLERK. Mr. Costello votes no. Ms. Johnson?

Ms. JOHNSON. No.

The CLERK. Ms. Johnson votes no. Ms. Woolsey?

[No response.]

The CLERK. Mr. Wu?

[No response.]

The CLERK. Mr. Baird?

Mr. BAIRD. No.

The CLERK. Mr. Baird votes no. Mr. Miller?

Mr. MILLER. No.

The CLERK. Mr. Miller votes no. Mr. Lipinski?

Mr. LIPINSKI. No.

The CLERK. Mr. Lipinski votes no. Ms. Giffords?

Ms. GIFFORDS. No.

The CLERK. Ms. Giffords votes no. Ms. Edwards?

Ms. EDWARDS. No.

The CLERK. Ms. Edwards votes no. Ms. Fudge?

Ms. FUDGE. No.

The CLERK. Ms. Fudge votes no. Mr. Luján?

Mr. LUJÁN. No.

The CLERK. Mr. Luján votes no. Mr. Tonko?

Mr. TONKO. No.

The CLERK. Mr. Tonko votes no. Mr. Garamendi?

[No response.]

The CLERK. Mr. Rothman?

[No response.]

The CLERK. Mr. Matheson?

[No response.]

The CLERK. Mr. Davis?

Mr. DAVIS. No.

The CLERK. Mr. Davis votes no. Mr. Chandler?

[No response.]
The CLERK. Mr. Carnahan?
Mr. CARNAHAN. No.
The CLERK. Mr. Carnahan votes no. Mr. Hill?
Mr. HILL. No.
The CLERK. Mr. Hill votes no. Mr. Mitchell?
Mr. MITCHELL. No.
The CLERK. Mr. Mitchell votes no. Mr. Wilson?
[No response.]
The CLERK. Mrs. Dahlkemper?
Mrs. DAHLKEMPER. No.
The CLERK. Mrs. Dahlkemper votes no. Mr. Grayson?
Mr. GRAYSON. No.
The CLERK. Mr. Grayson votes no. Ms. Kosmas?
Ms. KOSMAS. No.
The CLERK. Ms. Kosmas votes no. Mr. Peters?
[No response.]
The CLERK. Mr. Hall?
Mr. HALL. Aye.
The CLERK. Mr. Hall votes aye. Mr. Sensenbrenner?
[No response.]
The CLERK. Mr. Lamar Smith?
[No response.]
The CLERK. Mr. Rohrabacher?
Mr. ROHRABACHER. Yes.
The CLERK. Mr. Rohrabacher votes aye. Mr. Bartlett?
[No response.]
The CLERK. Mr. Ehlers?
[No response.]
The CLERK. Mr. Lucas?
Mr. LUCAS. Yes.
The CLERK. Mr. Lucas votes aye. Mrs. Biggert?
Mrs. BIGGERT. No.
The CLERK. Mrs. Biggert votes no. Mr. Akin?
[No response.]
The CLERK. Mr. Neugebauer?
Mr. NEUGEBAUER. Aye.
The CLERK. Mr. Neugebauer votes aye. Mr. Inglis?
[No response.]
The CLERK. Mr. McCaul?
[No response.]
The CLERK. Mr. Diaz-Balart?
Mr. DIAZ-BALART. Aye.
The CLERK. Mr. Diaz-Balart votes aye. Mr. Bilbray?
[No response.]
The CLERK. Mr. Adrian Smith?
Mr. SMITH OF NEBRASKA. Aye.
The CLERK. Mr. Adrian Smith votes aye. Mr. Broun?
Mr. BROUN. Aye.
The CLERK. Mr. Broun votes aye. Mr. Olson?
[No response.]
Chairman GORDON. Has anyone not been recorded? Mr. Rothman?
Mr. ROTHMAN. —I wish to be recorded as no.

The CLERK. Mr. Rothman votes no.

Chairman GORDON. Mr. Wu, how have you been recorded?

The CLERK. Mr. Wu votes no.

Chairman GORDON. Mr. Garamendi?

Mr. GARAMENDI. No.

The CLERK. Mr. Garamendi votes no.

Chairman GORDON. Mr. Matheson?

Mr. MATHESON. No.

The CLERK. Mr. Matheson votes no.

Chairman GORDON. Dr. Ehlers?

Mr. EHLERS. Aye.

The CLERK. Mr. Ehlers votes aye.

Chairman GORDON. And anyone else? Then the clerk will report the vote.

The CLERK. Mr. Chairman, eight members vote aye and 23 members vote no.

COMMITTEE ON SCIENCE AND TECHNOLOGY - 111th

DATE 4-28-10 AMENDMENT NO. 44 ROLL CALL NO. 4_
 Bill: H. R. 5116 – America COMPETES
 Reauthorization Act of 2010
 SPONSOR of AMEND – Mr. Neugebauer 069

PASSED VOICE VOTE
 DEFEATED ✓ WITHDRAWN

Quorum – 15 to vote – 22 to report

	MEMBER	AYE	NO	PRESENT	NOT VOTING
1	Mr. GORDON, Chair		✓		
2	Mr. COSTELLO - IL		✓		
3	Ms. JOHNSON - TX		✓		
4	Ms. WOOLSEY - CA				
5	Mr. WU - OR		✓		
6	Mr. BAIRD - WA		✓		
7	Mr. MILLER - NC		✓		
8	Mr. LIPINSKI - IL		✓		
9	Ms. GIFFORDS - AZ		✓		
10	Ms. EDWARDS - MD		✓		
11	Ms. FUDGE - OH		✓		
12	Mr. LUJÁN - NM		✓		
13	Mr. TONKO - NY		✓		
14	Mr. GARAMENDI, CA		✓		
15	Mr. ROTHMAN - NJ		✓		
16	Mr. MATHESON - UT		✓		
17	Mr. DAVIS - TN		✓		
18	Mr. CHANDLER - KY				
19	Mr. CARNAHAN - MO		✓		
20	Mr. HILL - IN		✓		
21	Mr. MITCHELL - AZ		✓		
22	Mr. WILSON - OH				
23	Mrs. DAHLKEMPER- PA		✓		
24	Mr. GRAYSON - FL		✓		
25	Ms. KOSMAS - FL		✓		
26	Mr. PETERS - MI				
27	Vacancy				
1	Mr. HALL- TX	✓			
2	Mr. SENSENBRENNER-WI				
3	Mr. LAMAR SMITH- TX				
4	Mr. ROHRBACHER- CA	✓			
5	Mr. BARTLETT- MD				
6	Mr. EHLERS- MI	✓			
7	Mr. LUCAS- OK	✓			
8	Mrs. BIGGERT- IL		✓		
9	Mr. AKIN- MO				
10	Mr. NEUGEBAUER- TX	✓			
11	Mr. INGLIS- SC				
12	Mr. McCAUL- TX				
13	Mr. DIAZ-BALART- FL	✓			
14	Mr. BILBRAY- CA				
15	Mr. ADRIAN SMITH- NE	✓			
16	Mr. BROUN - GA	✓			
17	Mr. OLSON- TX				
	TOTALS	8	23		

Chairman GORDON. Just for information of the Committee, we have—excuse me, the amendment fails. For the information of the members, we have three more amendments from Rohrabacher, oh, four from Mr. Rohrabacher. And then we will—there were a couple of amendments that passed. If those members are here, then we will cover those, and then we will be at final passage. So, the gentleman from California, Mr. Rohrabacher, is recognized. Are you ready to plea with your amendment?

Mr. ROHRABACHER. Thank you very much. I would think this would be—yes, I have an amendment at the desk.

Chairman GORDON. The clerk will report the amendment.

The CLERK. Is this amendment 034?

Mr. ROHRABACHER. This is amendment 034.

The CLERK. Okay.

The CLERK. 034, amendment to the amendment in the nature of a substitute offered by Mr. Rohrabacher of California.

Chairman GORDON. I ask unanimous consent to dispense with the reading. Without objection, so ordered. I recognize the gentleman for five minutes to explain his amendment.

Mr. ROHRABACHER. I think this should be relatively uncontroversial, or non-controversial, as compared to some of the other things, perhaps. It just simply says that any of the funds that are spent by the COMPETES Act must go to United States Citizens or United States entities. So we are just talking about giving this to American companies or U.S. Citizens, rather than people who are not citizens or foreign corporations. And I think that that pretty well speaks for itself, and I would hope—colleagues would believe this is not controversial. Thank you.

Chairman GORDON. Thank you. I know that the gentleman is very—is, you know, obviously sincere about this and well intentioned. The problem is this. Many of these projects are done in teams, and the effort is to get the best and brightest of the national labs, the public sector, the private sector, all around. And so there may very well be a Ph.D. or someone in this country who is working at a university, who is not a citizen here, who is the top expert in this area. And we would be—it is not like they are making some big profit. We would be cutting our nose off to spite our face if we do not let them participate. Additionally, what you have is you have a situation where many companies in this, you know, in the United States that are American companies do have plants overseas that might want to use some of this technology. If they are not allowed to do it, then they could very well be behind, and what—even though those profits are coming back here. So the intention is well, and I think there is some specific language in ARPA-E that stops the—if I could call on Mr. King to be more specific about that language.

COUNSEL. In the amendment in the nature of a substitute, there is language inserted into ARPA-E that refers to research and development of advanced manufacturing processes and technologies for the domestic manufacturing of novel energy technologies. If that is what you are referring to, sir.

Chairman GORDON. I yield back to Mr. Rohrabacher.

Mr. ROHRABACHER. Well, if that is what it is, no one should have any objection to voting for my amendment. And just have to tell

Mr. Chairman, I feel very strongly about this, and like I said earlier, when other objections were being made about Mr. Hall's amendment, we can always take things out to some—and find some one percent case or two percent case where something isn't the way we really want. But—and the spirit of this legislation is we want to help the people of the United States of America. The purpose of this—yeah, there may be a visiting professor or something like that. I don't care. I don't care about him. I care about our people, and I know you guys do too. And the bottom line is we need to set this standard. We are out for the people of the United States of America. We are for our companies. We are in a hole right now, and our first and only consideration should be them. I don't care about some foreign guy who wants to come in here, might be able to contribute. I would rather that job go to an American, period.

Mr. WU. Mr. Chairman?

Mr. ROHRBACHER. And that goes for the companies too, so I hope you can support it. Thank you.

Chairman GORDON. Mr. Wu is recognized?

Mr. WU. I understand the gentleman's intent, and I just want to get a little bit more specific with the Chairman's very well—placed general concerns about getting the best and brightest. If we go back to World War II and the Manhattan Project, I think the gentleman recognizes that there were a tremendous number of Americans and foreigners who worked together. Albert Einstein came to this country in 1933. He wrote his warning letter about a potential Nazi bomb project in 1939. He did not receive his citizenship until 1940. Now, maybe we should have cut off funds to Dr. Einstein between 1933 and 1940, but it might have had serious consequences for the security of this nation. Other participants in the Manhattan Project: Edward Teller got his U.S. Citizenship in 1941, well after the commencement of the Manhattan Project. Enrico Fermi got his U.S. Citizenship in 1944, again, well after the commencement of the Manhattan Project. And I guess I just want to rely on my own personal experience in that my father came to this country as a foreign graduate student, and he worked on materials science for the U.S. military, and he is very proud of that work, but he did all that work before he became a U.S. Citizen. And since then he has worked in the private sector, again, in the defense industry. I understand where the gentleman is coming from. I think that this would be devastating to our scientific leadership, and devastating to our national security. It is a great political point. I take it that the gentleman is sincere, but this is a counterproductive amendment, and I regretfully oppose it.

Mr. DAVIS. Would the gentleman yield?

Mr. WU. I would be happy to yield to the gentleman from Tennessee.

Mr. DAVIS. In Oak Ridge we have a national lab that has the SNS, Spallation Neutron Source. We also have a facility that has been built there for visiting scientists to come here from all across the world. Will this have an impact on them being able to use the facilities at the SNS project, or other national labs, such as our computer that we have in Oak Ridge? And will we in turn, as we visit their scientific research facilities, will they then deny us an

opportunity to engage in—I am just wondering if—how this will work. I mean, we have a lot of visiting scientists who come to Oak Ridge, and we in turn kind of exchange back and forth. If this doesn't deny them the right to actually participate in our research, in the facilities that we built and ARPA funds, I am okay with this amendment. But if it does, it means we stop actually having an exchange of ideas back and forth between many foreign scientists. Can someone answer that?

Chairman GORDON. Mr. King, you want to answer that?

COUNSEL. As I read the language, it would—I am sorry. As I read the language, it would prohibit funds being spent on projects in which foreign scientists are involved.

Mr. DAVIS. If Mr. Wu would yield, I think the bottom line is this. Mr. Rohrabacher, and I think all of us, our objective is we want the best for the American people. To me, the best is to get the best product out. You know, I mean, the way we win is to have, you know, new technologies, new breakthroughs. And so if it is Enrico Fermi, if it is Albert Einstein, if it is Van Buren, you know, if they can help us get that very best product, that is how Americans win. And if there is—Dr. Ehlers is recognized.

Mr. EHLERS. I don't want to beat a dead horse here, but let me just express the opinion of a scientist, and that is that science is an international enterprise. Scientists around the world work together. They publish primarily in English, but if they publish in Russian or Greek or something else, it is usually translated into English. Everyone works together worldwide, and most scientists don't care who pays them, just so they get something paid for. But they truly enjoy working on science, and they are always after the best and brightest. A current example, I just turned in today to the—and a resolution commending the 100th anniversary of the development of the MASER, which led to the—I am sorry, of the MASER, which led to the laser. Charles Townes, who is a friend of mine, he is currently at Berkeley, developed a MASER here in the United States. A few months later, the Russians developed a different version of the maser. It had an advantage that it operated continuously, instead of in pulses the way that the Townes one did. Some bright Americans took the ideas from both scientists in commerce and developed a current laser. And, of course, it has gone through many iterations since then. If you look at that—I calculated at one point that Mr. Townes got something like 100 to \$200,000 from the Federal government to develop the maser. Today the laser industry is a multi-billion dollar industry developed on the basis of the work done by both the Russians and by Dr. Townes and his aides. Both of them won Nobel prizes for it, even though the developed a MASER rather than the laser, but that was the big breakthrough. And so it is—it would be impossible to sort out who contributed what, and if they were employed, who should get paid and who would pay them. So it is—it truly is a completely international effort. I am in great sympathy with what Mr. Rohrabacher's trying to do. We should not be willy-nilly handing out money to foreign entities, especially entities, but even individuals, unless we can gain something from it. In the case of the laser and the maser, we did gain a great deal from it because we took the lead on the laser, and the laser industry has developed here.

It is now worldwide. So you use lasers from everything to laying out sewer lines, putting in ceilings so that they're all level, to surgery, whether it is removing tonsils or hemorrhoids. Lasers have an incredible number of uses, and it is, as I say, a huge industry. So you have to be very careful in—when—and analyzing this, you may lose more than you gain by restricting the funds in one broad stroke. I think there are matters of principle, like Mr. Rohrabacher's, which I think are very important, but which can better be enforced by the individuals running the various operations, such as the example you heard from Oak Ridge. And—where we built it, we own it, we operate it. But if we can benefit from a scientist coming over from some other country and operating it and doing their research there, we gain and they gain. So it is not a zero sum game. Sorry for the long speech, but that is just the way science works. Thank you.

Mr. BAIRD. Mr. Chairman?

Chairman GORDON. Mr.—oh, okay. Mr. Baird is recognized.

Mr. BAIRD. Just very brief. I see at least three of the paintings in this room deal with our space program. There is a gentleman named Wernher von Braun who had a fairly significant impact on the U.S. space program. He didn't originate in the United States of America. His past was not necessarily the best, but his contributions to the future was profound, and we were darn lucky that we had that contribution. We worked awfully hard to make sure we got it instead of the other guys. Second point, I am familiar with a company in my district that had an opportunity to expand dramatically and create a number of American jobs, but because one of their co-founders, one of the geniuses behind the company, was Indian of origin and was not yet a U.S. Citizen, he was here legally, and it was a co-founded company, they became ineligible for it here domestically, and they ended up offshoring. We actually lost American jobs because of this requirement. There was a 100 percent requirement. The final point I will make is there is a rather striking irony to me that on the one hand we are saying, by God, let us—and rightfully so, let us make sure the greatest number of American money goes to American scientists. The bill before us today's primary function, the America Competes Act, is to increase the numbers of American scientists, and yet we are also debating freezing funding for that bill. You can't, on the one hand, say, let us freeze funding and not educate more American scientists, and then say, but only American scientists are who we are going to help. You have got to expand the pool of American scientists. America Competes is precisely designed to do it. That is why we are insisting on additional funding, and I just see a remarkable lack of foresight in this. And I, you know, I support the Buy America Act. When it comes to heavy U.S. manufacturing, we have got to keep some of that domestic supply. But as Mr. Ehlers so ably said, and Mr. Wu and many others, and the Chairman, there are a lot of smart people in the world, and we need to work with them. And if we say the only project that is going to get money has to be headquartered in the U.S., the Large Hadron Collider's out. A host of international collaborations that our scientists and our citizens benefit from—and I have been a critic of the Hadron Collider not because of its location, because of its cost. But if we just say

everything has to come here, and only U.S. men and women benefit, it is the U.S. population and the U.S. economy that is going to lose profoundly in the long run, and I would urge—

Chairman GORDON. Mr. Hall is recognized.

Mr. HALL. Mr. Chairman, I yield to Mr. Rohrabacher.

Mr. ROHRABACHER. Thank you, Mr. Hall. Hey, come on, we are not talking about fighting World War II here. We are talking about the U.S. COMPETES. That is what—we are trying to make America competitive, and you don't make America competitive and have more scientists here and get more people into science here by subsidizing foreigners, all right? So we are going to spend a certain amount of money, and that it should go to Americans, is just so—such a simple proposition, I think that we should be able to understand that. And it is not World War II, and we are not talking about that. Look, the bottom line is, we hope there are more Americans here who will get into the sciences. If we subsidize foreigners who come in, we are going to have fewer Americans getting into the sciences. That is just the way it works. We can have—I am flabbergasted with the response to this. I thought this was going to be totally non-controversial, given the limited amount of money that we have to try to promote a—something that is supposed to have us compete and to stimulate science education in our country, and we are worried that we are going to spend—certainly don't want to spend the money on Americans. Come on.

Mr. BAIRD. That is not what—

Mr. ROHRABACHER. Well, I am afraid that is what this is all about. And we can be very sophisticated and come up with very sophisticated scenarios how in some way America is going to benefit better—you are going to have American scientists be better by giving the money to a foreigner who comes here. Now, I will tell you this, we have got plenty of American scientists and engineers who deserve to have some little help when they are trying to develop a new product. And that is what this is all about. We have got—there are—for every one Wernher von Braun—I think he did eventually become a U.S. Citizen. Okay.

Mr. BAIRD. So did Edward Teller.

Mr. ROHRABACHER. Let us—

Mr. BAIRD. So did Einstein.

Mr. ROHRABACHER. —wait for Wernher von Brauns to become U.S. Citizens before we give them our money. And that would maybe encourage people to come here and become U.S. citizens, which is a good thing. But, again, what we have—I mean, I am literally flabbergasted at what I am hearing, and I bet there are a lot of people out there who are listening to this and saying, well, does it really mean that if we just give our money to an American company, which is the next one that says, we are going to provide the money, but only if they are going to develop—if it is going to be used for developing manufacturing outside of our country, we are not going to give it to those companies. I imagine you are going to be against that as well. There is nothing wrong with us representing the interests of the American people and having—and yes, you don't have to try to have an analysis that carries it five steps down to—down the road to see, well, maybe there is an explanation that would make some sense, where we are actually giving

the money to a foreigner rather than an American. I will just say that we have got lots of kids and lots of businesses and lots of people with creative ideas here who are U.S. citizens, and if we are going to have the COMPETES Act—I took it for granted when we say competes we are talking about America competing. I take it for granted that is what that means, doesn't it? I mean, we are not talking about improving the world. We are talking about making America compete. So what is wrong, if that is the purpose of the bill, making sure the money goes to Americans? So—

Chairman GORDON. Would the gentleman yield?

Mr. ROHRABACHER. Of course. I am sorry for getting passionate about this, but—

Chairman GORDON. Mr. Grayson's been—

Mr. ROHRABACHER. I will certainly yield.

Chairman GORDON. —has been patient here.

Mr. ROHRABACHER. Yes. I am sorry.

Chairman GORDON. His time is not up.

Mr. GRAYSON. Thank you, Mr. Chairman. I was listening carefully to Mr. Rohrabacher's comments, and I would never want to be accused of sophistication, but there is one scenario that concerns me about this amendment, and that is this, and I would like to ask him to address it if—

Mr. ROHRABACHER. All right.

Mr. GRAYSON. —he would.

Mr. ROHRABACHER. Yes.

Mr. GRAYSON. It appears to me that this amendment quite possibly violates several free trade acts that we have entered into, the North American Free Trade Act, several other trade acts, and probably the General Agreement on Tariffs and Trade. Now, what happens when our government violates those provisions, that we are subject to international litigation, and the taxpayers end up paying for that. Not just the cost of litigation, but also the liability. And I am concerned about the possibility that exactly that would happen. I understand that that is a sophisticated scenario, but I am concerned about it.

Mr. ROHRABACHER. Well—

Mr. GRAYSON. Has the gentleman inquired as to whether—

Mr. ROHRABACHER. All right.

Mr. GRAYSON. —this amendment actually would, in fact, comply with all of our international trade agreements, specifically those—

Mr. ROHRABACHER. You know—

Mr. GRAYSON. —governing government acquisition?

Mr. ROHRABACHER. Okay. I will be happy to address it. Reclaiming my time, you know, when I first ran for office, one of the—my most effective political slogans was, vote for Dana, at least he is not a lawyer. And I have to tell you right now, that is a question for legal counsel. And maybe we want to ask legal counsel, what are the Constitutional implications of this, how does this impact on our various treaties, et cetera? But I think that it is pretty common sense that we can pass things through the United States Congress that are aimed at benefiting the American people, to the exclusion of having to provide that same amount of money to foreigners. I happen to believe that that has to be legal in the broadest sense, and hopefully in the specific sense. If we have entered into treaties

now where the money that we put through this Congress has to go to foreigners as well as to American citizens, I think that we have gone way in the wrong direction, and that needs to be addressed—

Mr. GRAYSON. Well, that may well be true if—Mr. Chairman, I can respond briefly?

Chairman GORDON. Okay.

Mr. GRAYSON. That may well be true, that—it may well be true that we have gone too far, but, in fact, in many cases, that is the law. In fact, that is one of the fundamental purposes of many of these treaties. And what we are actually doing, if we pass something like this, is we are giving a blank check to foreign entities to come and to come to our court—

Mr. ROHRABACHER. I don't want to give any checks to the foreigners. You are the—

Mr. GRAYSON. Well, I mean, it—once it is law, it is law, and if you do this, and you create a liability for us—

Mr. ROHRABACHER. It is—

Mr. GRAYSON. —under the General Agreement on Tariffs and Trade, and under NAFTA and otherwise, it is—

Mr. ROHRABACHER. Well—

Mr. GRAYSON. —too late to take it back. There are no—

Mr. ROHRABACHER. Yeah.

Mr. GRAYSON. —do-overs in international law. And I think that at least it would be incumbent upon the Member to inquire into this possibility before offering such an amendment and giving us unlimited liability for the U.S. taxpayers.

Mr. ROHRABACHER. I see.

Chairman GORDON. Mr. Rohrabacher's time has expired. If there is no further discussion, the vote is on Mr. Rohrabacher's amendment. All in favor say aye. Opposed, no. The nos have it. The amendment is not agreed to. The next amendment on the roster is an amendment offered by the gentleman from California, Mr. Rohrabacher. You—are you ready to proceed with your—

Mr. ROHRABACHER. I have a feeling that I am going to get the same reaction from this one, which just basically says that—

Chairman GORDON. Just one second. The Clerk will—

Mr. ROHRABACHER. Yes. I have an amendment at the desk.

Chairman GORDON. The clerk will report the amendment.

Mr. ROHRABACHER. Okay.

The CLERK. Amendment number 035, amendment to the amendment in the nature of a substitute offered by Mr. Rohrabacher of California.

Chairman GORDON. I ask unanimous consent to dispense with the reading, and without objection, so ordered. I recognize the gentleman for five minutes to explain his amendment.

Mr. ROHRABACHER. Well, basically, I guess I am going to receive the same kind of reception, but, again, I didn't expect it, because I expected this also to be quite non-controversial. This amendment requires that anyone receiving funding under the Competes Act to compete—I think that meant America Competes, although that wasn't in there—Competes Act cannot use the money, and has to agree that he is not going to use the money, for development of technology to be used in manufacturing outside the United States. So if he is going to take the money, it can't be used for manufac-

turing outside the United States. And at that, I think it is common sense that we don't give money to people who want to set up manufacturing facilities overseas in times like these. And, in fact, we do, and to be fair about it, there is lots of precedent for that. We actually have the export/import bank and other institutions in our society that have been subsidizing the investment in manufacturing facilities overseas for decades, and that is why we are in the hole that we are in. And I would hope that the U.S. Competes Act does not proceed in that direction, but proceeds instead in making us more competitive, rather than building technologies to upgrade foreign manufacturing. Thank you, and I yield back the balance of my time.

Chairman GORDON. Thank you, Mr. Rohrabacher. Once again, it—I know it is only with the best intentions that you introduce this amendment. I think there are some potential problems here that we need to keep in mind. First of all, we have a global market now, and many of our major corporations in this country have international operations already because it is necessary whether—when they are selling goods in another country, whether it is next day type of service, or whatever it might be. So we would, I am afraid, not allow our U.S. companies to have the best manufacturing ability elsewhere to compete and so I think that we would be harming ourselves with this. And if there is no further discussion, then the vote occurs on the amendment. All in favor of the amendment say aye. Those opposed, no. The no's have it, and the amendment is not agreed to. The gentleman from California, Mr. Rohrabacher.

Mr. ROHRABACHER. I have an amendment at the desk, and I am noting that I haven't called any roll call votes on these other votes.

Chairman GORDON. The clerk will report the amendment.

The CLERK. Amendment 036, amendment to the amendment in the nature of a substitute offered by Mr. Rohrabacher of California.

Chairman GORDON. I ask unanimous consent to dispense with the reading. Without objection, so ordered. I recognize the gentleman for five minutes.

Mr. ROHRABACHER. Well, this amendment says that anyone who has infringed, and has been found guilty of infringing on the patent rights of others, cannot receive funding under the U.S. COMPETES Act. And I will have to admit that it doesn't say that any U.S. Citizen who has infringed, so—what I am trying to do is just thieves, but I will have to admit that it is aimed at any thief. And if there are foreign thieves that come in and want to steal from our citizens, their patent rights, I don't know if that is going to actually prevent them from getting this money as well. But let just say, in principle, one of my amendments is that if you have infringed on someone else's patent and you have been found guilty of that, we should not be giving you money to develop your technology. Let us not finance thieves. This should be the motto.

Chairman GORDON. The Chairman recognizes himself. In principle, you are absolutely correct, Mr. Rohrabacher. Unfortunately, in practice, some of the—there are what you might call—it wouldn't be coincidental, but minor infringements that were not intended. And let me—so let me tell you, if this would go—if this amendment were in effect, Apple, Microsoft, Honeywell, IBM,

Montsanto, ADM, Dow, Dupont, General Electric and others would not be eligible.

Mr. ROHRABACHER. They shouldn't be eligible. We are talking about people who can afford to have their—pay for their own research.

Chairman GORDON. But our country would be worse off if we did not have these companies able to export and bring back that revenue here.

Mr. ROHRABACHER. But they can pay for their own thing. I mean, why should we be giving those huge corporations the money? They have got their own money. This is supposed to be aimed at people who cannot get money for their—for very high risk propositions and things in ARPA and this. But all this Federal money that goes every place, it is not supposed to go to our biggest corporations, whether it is NIST or whether it is ARPA-E or any of these other things. We are not subsidizing big corporations, are we? We are trying to basically further science. So if they have infringed upon—those big corporations have infringed on little guys' patents, hey, let us give them the incentive not to infringe—

Mr. BAIRD. Mr. Chairman?

Mr. ROHRABACHER. —on the little guys' patents.

Mr. BAIRD. Will the gentleman yield?

Chairman GORDON. Dr. Baird is recognized.

Mr. BAIRD. I mean, let us step back for a second. Again, I am a strong proponent of intellectual property rights. I know the gentleman has worked with some brilliant inventors and—who depend on that, and so I support the intent of that. Protecting intellectual property rights is vital. The challenge, however, is twofold. One, it occasionally happens that ultimately an infringement case goes against the company, and they didn't willfully—they didn't say, let us go steal an intellectual property right. A judge ruled that there was a—that somebody already held that patent, and you somehow violated the patent, okay? But under this, I think, if that is the case, then you could be ruled out. Second point is, this is not just about ARPA-E. This is about the entire—as I read it, this is about all the span of NSF activities. Let us suppose, for example, that NSF is working on a major project, a mega science project, and they need the latest—I mean, the gentleman is a strong advocate of nuclear power. Well, GE builds things like magnets and containment vessels, et cetera. If we are doing research on nuclear power, and if GE is the prime contractor that supplies those, but the mere fact that at some point in its career GE had a patent infringement case that went against it, GE now can't supply. So who the heck is going to supply it? Certainly not a French company, or a Japanese. I mean, the problem is it is overly broad. The gentleman is absolutely right that we have to defend intellectual property rights. He is absolutely right, and I think this committee intends to take up measures of that—towards that end, but I just think this is so broad that it would actually profoundly harm our competitiveness and virtually paralyze a whole lot of, you know, if you can't work with Microsoft, for example, and national security of the computer systems, if you can't work with Apple on that, if you can't work with GE on energy, if you can't work with Monsanto on a host of

chemical products that—my goodness gracious, we are going to freeze out an awful lot of productive America—

Mr. ROHRABACHER. —yield at that point?

Mr. BAIRD. That would be something I would yield, so I will yield back. I thank the gentleman.

Chairman GORDON. If it is my time, I yield to you.

Mr. ROHRABACHER. I think the gentleman has a point, and perhaps the legislation should say that they have found—been found guilty of intentionally infringing on someone's patent rights. And not all infringement cases are based on the idea that someone has intentionally done this, but they have—there has been an infringement without an intent to do so. So that definition is—I accept that criticism. I—when I—when my amendment goes down in flames, I will think about that when I write the next one, but let me just note that, in terms of these big companies that you are talking about, I think one of the big problems we have is that we are trying to mold our efforts towards these huge mega corporations, and that is not where innovation in this country comes from. That is not what the—what is going to bring us to a higher level of prosperity and competition and competitiveness in this world. These big companies are not—frankly, I think that we have got to make sure that when we are doing these things we are developing policies that rein these companies in, rather than subsidize them in their current status of basically dominating whole segments of our country. So I am—I think you have made a good point, and so I will withdraw my amendment at this time because it does not include the word intentional infringement. Thank you.

Chairman GORDON. You could have done that earlier. The next amendment on the roster is an amendment offered by the gentleman from California, Mr. Rohrabacher. Are you ready to proceed with your amendment?

Mr. ROHRABACHER. All right. Now, let us—this may be something that—

Chairman GORDON. You are getting closer.

Mr. ROHRABACHER. —can accept. I have an amendment at the desk.

Chairman GORDON. The clerk will report the amendment.

The CLERK. Amendment number 037, amendment to the amendment in the nature of a substitute offered by Mr. Rohrabacher of California.

Chairman GORDON. I ask unanimous consent to dispense with the reading. Without objection, so ordered. I recognize the gentleman for five minutes to explain the amendment.

Mr. ROHRABACHER. Okay. Basically this amendment apportions the intellectual property rights when we are involved with these activities with various corporations, and various individuals, that—it apportions the intellectual property rights that comes out of research projects and these various programs that we are talking about, it apportions the rights to the granting agency, meaning the agency that—the Federal Government—well, then the U.S. taxpayers, via that agency, will then own a portion of the intellectual property rights that is in direct proportion to the overall funding of the project. So if—for example, if the Federal government provides 20 percent of a project's funding, the American taxpayer then

will have 20 percent of the value, in terms of the intellectual property rights, resulting from that technology. I—it seems to me, again, whether—especially when we are talking about these big corporations, we should not just be giving money away to people like this, and there should be a payback for us. And if indeed we are involved with helping develop some fantastic new technology that helps us compete, but at the same time makes an entity like General Electric or someone else billions of dollars because the intellectual property rights now are of great value, why shouldn't the American taxpayer—if we have subsidized that whole operation and the development of that product and that new technology, why shouldn't we get the portion—a portion of that? We should be—and that is all my amendment does. I think it makes sense, and maybe this will resonate more on the other side of the aisle than my other amendment.

Mr. GRAYSON. Will the gentleman yield for a question?

Mr. ROHRABACHER. I certainly will.

Mr. GRAYSON. What happens if this amendment is not passed? What is the apportionment if it is not passed?

Mr. ROHRABACHER. I am not sure.

Chairman GORDON. Chairman yields to himself. There is nobody here with a truer heart than you, Mr. Rohrabacher, and I mean that. You are trying to do the right thing, and I think you are doing the right thing. Let me tell you what I think is the potential problem on this situation, and that is that there are two major laws that deal with these, Stevenson-Wydler Technology Innovation Act and the Bayh-Dole Act. And I understand that Mr. Wu is going to take up at least hearings, and hopefully potentially legislation, on these in a—on a more comprehensive basis later, and I think that it would be better off, you know, to do this on a comprehensive basis with, you know, after we have the hearings, rather than a single shot here. But clearly you raise a very significant concern. And I—

Mr. ROHRABACHER. I—

Chairman GORDON. —yield to—

Mr. ROHRABACHER. I am glad I am—I am glad the Chairman thinks it is a significant concern. That is why I would like to make sure it is in the legislation.

Chairman GORDON. Okay. So if there is no further—oh, Ms. Edwards is recognized.

Ms. EDWARDS. Well, I didn't think I would see the day, Mr. Rohrabacher, but you have touched a kind nerve of mine here, because I am very sympathetic—

Mr. ROHRABACHER. All right.

Ms. EDWARDS. —on this. I don't—

Mr. HALL. Let me tell you something, she is good help too—Rohrabacher.

Ms. EDWARDS. I am concerned that in instances where the Federal government puts up all the money and a lot of the risk and the taxpayers get really none of the benefit.

Mr. ROHRABACHER. Right.

Ms. EDWARDS. Nonetheless, though, I would like to deal with it—I would like to deal with it in a much more comprehensive way, because it isn't just here that that happens. Happens all the time,

and all throughout our agencies and our research institutions. And then there is a lot of profit to be made off of that, which we could actually funnel back into—

Mr. ROHRABACHER. Yeah.

Ms. EDWARDS. —research.

Mr. ROHRABACHER. Um-hum.

Ms. EDWARDS. So my commitment, while I am not going to support this here because I think it does deserve much more comprehensive consideration, I would look forward to working with you to deal with this in a way that enables taxpayers to retrieve the benefit of their investment in the same way that corporations get the benefit of their—those investments. And so I think you for offering the amendment, and I think you raise a really strong point on behalf of the taxpayers, and I look forwards to working with you. Thank you. With that, I yield.

Chairman GORDON. If there is no further discussion, the vote is on the motion. All in favor of the motion, say aye. Opposed no. The nos have it, and Mr.—

Mr. ROHRABACHER. Mr. Chairman, I would ask for a recorded vote on that.

Chairman GORDON. And you will get it. The clerk will call the roll.

The CLERK. Chairman Gordon?

Chairman GORDON. No.

The CLERK. Chairman Gordon votes no. Mr. Costello?

Mr. COSTELLO. No.

The CLERK. Mr. Costello votes no. Ms. Johnson?

Ms. JOHNSON. No.

The CLERK. Ms. Johnson votes no? Okay. Ms. Woolsey?

Ms. WOOLSEY. No.

The CLERK. Ms. Woolsey votes no. Mr. Wu?

Mr. WU. No.

The CLERK. Mr. Wu votes no. Mr. Baird?

Mr. BAIRD. No.

The CLERK. Mr. Baird votes no. Mr. Miller?

Mr. MILLER. No.

The CLERK. Mr. Miller votes no. Mr. Lipinski?

Mr. LIPINSKI. No.

The CLERK. Mr. Lipinski votes no. Ms. Giffords?

Ms. GIFFORDS. No.

The CLERK. Ms. Giffords votes no. Ms. Edwards?

[No response.]

The CLERK. Ms. Fudge?

Ms. FUDGE. No.

The CLERK. Ms. Fudge votes no. Mr. Luján?

Mr. LUJÁN. No.

The CLERK. Mr. Luján votes no. Mr. Tonko?

Mr. TONKO. No.

The CLERK. Mr. Tonko votes no. Mr. Garamendi?

Mr. GARAMENDI. No.

The CLERK. Mr. Garamendi votes no. Mr. Rothman?

[No response.]

The CLERK. Mr. Matheson?

Mr. MATHESON. No.

The CLERK. Mr. Matheson votes no. Mr. Davis?
 Mr. DAVIS. No.
 The CLERK. Mr. Davis votes no. Mr. Chandler?
 [No response.]
 The CLERK. Mr. Carnahan?
 Mr. CARNAHAN. No.
 The CLERK. Mr. Carnahan votes no. Mr. Hill?
 Mr. HILL. No.
 The CLERK. Mr. Hill votes no. Mr. Mitchell?
 Mr. MITCHELL. No.
 The CLERK. Mr. Mitchell votes no. Mr. Wilson?
 [No response.]
 The CLERK. Mrs. Dahlkemper?
 Mrs. DAHLKEMPER. No.
 The CLERK. Mrs. Dahlkemper votes no. Mr. Grayson?
 Mr. GRAYSON. No.
 The CLERK. Mr. Grayson votes no. Ms. Kosmas?
 Ms. KOSMAS. No.
 The CLERK. Ms. Kosmas votes no. Mr. Peters?
 Mr. PETERS. No.
 The CLERK. Mr. Peters vote no. Mr. Hall?
 Mr. HALL. Yes.
 The CLERK. Mr. Hall votes aye. Mr. Sensenbrenner?
 [No response.]
 The CLERK. Mr. Lamar Smith?
 [No response.]
 The CLERK. Mr. Rohrabacher?
 Mr. ROHRABACHER. Yes.
 The CLERK. Mr. Rohrabacher votes aye. Mr. Bartlett?
 [No response.]
 The CLERK. Mr. Ehlers?
 Mr. EHLERS. Aye.
 The CLERK. Mr. Ehlers votes aye. Mr. Lucas?
 Mr. LUCAS. Aye.
 The CLERK. Mr. Lucas votes aye. Mrs. Biggert?
 [No response.]
 The CLERK. Mr. Akin?
 [No response.]
 The CLERK. Mr. Neugebauer?
 Mr. NEUGEBAUER. Aye.
 The CLERK. Mr. Neugebauer votes aye. Mr. Inglis?
 [No response.]
 The CLERK. Mr. McCaul?
 Mr. MCCAUL. Aye.
 The CLERK. Mr. McCaul votes aye. Mr. Diaz-Balart?
 Mr. DIAZ-BALART. Aye.
 The CLERK. Mr. Diaz-Balart votes aye. Mr. Bilbray?
 Mr. BILBRAY. Even a broken clock is right twice a day. I vote aye.
 The CLERK. Mr. Bilbray votes aye. Mr. Adrian Smith?
 [No response.]
 The CLERK. Mr. Broun?
 Mr. BROUN. Aye.
 The CLERK. Mr. Broun votes aye. Mr. Olson?
 Mr. OLSON. Aye.

The CLERK. Mr. Olson votes aye.

Ms. EDWARDS. Mr. Chairman?

Chairman GORDON. Is there anyone whose vote—Ms. Edwards?

Ms. EDWARDS. Aye.

The CLERK. Ms. Edwards votes aye.

Chairman GORDON. Is there—well, Mrs. Biggert?

Mrs. BIGGERT. Aye.

The CLERK. Mrs. Biggert votes aye.

Chairman GORDON. —recoded? If not, the clerk will record the vote—or report the vote.

The CLERK. Mr. Chairman, 12 members vote aye, and 22 members vote no.

COMMITTEE ON SCIENCE AND TECHNOLOGY - 111th

DATE 4-28-10 AMENDMENT NO. 48 ROLL CALL NO. 5_
 Bill: H. R. 5116 – America COMPETES
 Reauthorization Act of 2010
 SPONSOR of AMEND – Mr. Rohrabacher 037

PASSED VOICE VOTE
 DEFEATED ✓ WITHDRAWN

Quorum – 15 to vote – 22 to report

	MEMBER	AYE	NO	PRESENT	NOT VOTING
1	Mr. GORDON, Chair		✓		
2	Mr. COSTELLO - IL		✓		
3	Ms. JOHNSON - TX		✓		
4	Ms. WOOLSEY - CA		✓		
5	Mr. WU - OR		✓		
6	Mr. BAIRD - WA		✓		
7	Mr. MILLER - NC		✓		
8	Mr. LIPINSKI - IL		✓		
9	Ms. GIFFORDS - AZ		✓		
10	Ms. EDWARDS - MD	✓			
11	Ms. FUDGE - OH		✓		
12	Mr. LUJÁN - NM		✓		
13	Mr. TONKO - NY		✓		
14	Mr. GARAMENDI, CA		✓		
15	Mr. ROTHMAN - NJ				
16	Mr. MATHESON - UT		✓		
17	Mr. DAVIS - TN		✓		
18	Mr. CHANDLER - KY				
19	Mr. CARNAHAN - MO		✓		
20	Mr. HILL - IN		✓		
21	Mr. MITCHELL - AZ		✓		
22	Mr. WILSON - OH				
23	Mrs. DAHLKEMPER - PA		✓		
24	Mr. GRAYSON - FL		✓		
25	Ms. KOSMAS - FL		✓		
26	Mr. PETERS - MI		✓		
27	Vacancy				
1	Mr. HALL - TX	✓			
2	Mr. SENSENBRENNER - WI				
3	Mr. LAMAR SMITH - TX				
4	Mr. ROHRABACHER - CA	✓			
5	Mr. BARTLETT - MD				
6	Mr. EHLERS - MI	✓			
7	Mr. LUCAS - OK	✓			
8	Mrs. BIGGERT - IL	✓			
9	Mr. AKIN - MO				
10	Mr. NEUGEBAUER - TX	✓			
11	Mr. INGLIS - SC				
12	Mr. McCAUL - TX	✓			
13	Mr. DIAZ-BALART - FL	✓			
14	Mr. BILBRAY - CA	✓			
15	Mr. ADRIAN SMITH - NE				
16	Mr. BROUN - GA	✓			
17	Mr. OLSON - TX	✓			
	TOTALS	12	22		

Chairman GORDON. Thank you. The next amendment on the roster—oh, the amendment has not passed. The next amendment on the roster is an amendment offered by the gentleman from Georgia, Dr. Broun. Let me say that Dr. Broun is—told me he wants to be brief, but he wants to have a recorded vote, so those that are here may want to stay here. Are you ready to proceed with your amendment?

Mr. BROUN. Thank you, Mr. Chairman. Yes, I have an amendment at the desk

Chairman GORDON. The clerk will report the amendment.

The CLERK. Amendment number 028, amendment to the amendment in the nature of a substitute offered by Mr. Broun of Georgia.

Chairman GORDON. I ask unanimous consent to dispense with the reading. Without objection, so ordered. Recognize the gentleman for five minutes to explain his amendment.

Mr. BROUN. Thank you, Mr. Chairman. My amendment would simply streamline the overall COMPETES program by removing the new programs. In these tough economic times we can't do everything that we want to do, so we need to prioritize our resources. The amendment prioritizes core research at the three priority agencies and gives them substantial increases, which has long been the top recommendation of the science and business community. I am concerned about the new program's redundancy with other existing programs. For example, the loan guarantees are similar to the Small Business Administration's loan guarantee program for which manufacturers are eligible. Also, the Hubs appear to be redundant with existing DOE activities. Specifically, the FY 2011 budget proposes \$34 million for a hub on batteries and energy storage, but EERE's [Office of Energy Efficiency and Renewable Energy] budget for energy storage in same year, FY 2011, is \$94 million on top of the \$1.9 billion that it received in the stimulus for vehicle battery manufacturing grants. ARPA-E has an explicit solicitation for energy storage projects. There are at least five Energy Frontier Research Centers [EFRCs] funded by the Office of Science that are working on energy storage. And fourthly, the Office of Electricity Delivery and the loan guarantee program both support energy storage and battery development activities. So why do we need this activity funded by a fifth program, and why do we need so many different entities pursuing the same technology? Eliminating the new loan guarantee and Hubs program alone would reduce the authorized amounts in the bill by over \$1 billion, 250 million for the loan guarantees and 850 million for the Hubs. Additionally, removing the prize awards in Section 228, 12 million over three years of the pilot program, an innovative services initiative in Section 406, no cost, the bio-research program in Section 407, and the regional innovation program, such sums in Section 503, would further reduce the authorization levels and promote better fiscal management. As I have said before, our deficits are projected to remain above \$1 trillion for the foreseeable future, and our debt held by the public is ever growing. Additionally, this reauthorization goes beyond the President's request. It only makes good financial sense to re-examine this reauthorization and not invest in any new spending on new programs until our financial house gets back into better shape. I urge the Committee to support this amendment so that we can

be examples of fiscal responsibility not only within this committee, but for other committees, and lead by example. Mr. Chairman, I thank you for allowing me to discuss this amendment. I have no misconceptions about the final result of the vote. Thus, I suggest to the committee Chairman that we dispense with any further discussion, call the question and proceed with a recorded vote, and I so move.

Chairman GORDON. Always try to serve you. The clerk will call the roll.

The CLERK. Chairman Gordon?

Chairman GORDON. No.

The CLERK. Chairman Gordon votes no. Mr. Costello?

[No response.]

The CLERK. Ms. Johnson?

Ms. JOHNSON. No.

The CLERK. Ms. Johnson votes no. Ms. Woolsey?

Ms. WOOLSEY. No.

The CLERK. Ms. Woolsey votes no. Mr. Wu?

Mr. WU. No.

The CLERK. Mr. Wu votes no. Mr. Baird?

[No response.]

The CLERK. Mr. Miller?

Mr. MILLER. No.

The CLERK. Mr. Miller votes no. Mr. Lipinski?

Mr. LIPINSKI. No.

The CLERK. Mr. Lipinski votes no. Ms. Giffords?

[No response.]

The CLERK. Ms. Edwards?

Ms. EDWARDS. No.

The CLERK. Ms. Edwards votes no. Ms. Fudge?

Ms. FUDGE. No.

The CLERK. Ms. Fudge votes no. Mr. Luján?

Mr. LUJÁN. No.

The CLERK. Mr. Luján votes no. Mr. Tonko?

Mr. TONKO. No.

The CLERK. Mr. Tonko votes no. Mr. Garamendi?

Mr. GARAMENDI. No.

The CLERK. Mr. Garamendi votes no. Mr. Rothman?

[No response.]

The CLERK. Mr. Matheson?

Mr. MATHESON. No.

The CLERK. Mr. Matheson votes no. Mr. Davis?

Mr. DAVIS. No.

The CLERK. Mr. Davis votes no. Mr. Chandler?

[No response.]

The CLERK. Mr. Carnahan?

[No response.]

The CLERK. Mr. Hill?

Mr. HILL. No.

The CLERK. Mr. Hill votes no. Mr. Mitchell?

Mr. MITCHELL. No.

The CLERK. Mr. Mitchell votes no. Mr. Wilson?

[No response.]

The CLERK. Mrs. Dahlkemper?

Mrs. DAHLKEMPER. No.
 The CLERK. Mrs. Dahlkemper votes no. Mr. Grayson?
 Mr. GRAYSON. No.
 The CLERK. Mr. Grayson votes no. Ms. Kosmas?
 Ms. KOSMAS. No.
 The CLERK. Ms. Kosmas votes no. Mr. Peters?
 Mr. PETERS. No.
 The CLERK. Mr. Peters votes no. Mr. Hall?
 Mr. HALL. Aye.
 The CLERK. Mr. Hall votes aye. Mr. Sensenbrenner?
 [No response.]
 The CLERK. Mr. Lamar Smith?
 [No response.]
 The CLERK. Mr. Rohrabacher?
 Mr. ROHRABACHER. Aye.
 The CLERK. Mr. Rohrabacher votes aye. Mr. Bartlett?
 [No response.]
 The CLERK. Mr. Ehlers?
 [No response.]
 The CLERK. Mr. Lucas?
 Mr. LUCAS. Aye.
 The CLERK. Mr. Lucas votes aye. Mrs. Biggert?
 Mrs. BIGGERT. No.
 The CLERK. Mrs. Biggert votes no. Mr. Akin?
 [No response.]
 The CLERK. Mr. Neugebauer?
 Mr. NEUGEBAUER. Aye.
 The CLERK. Mr. Neugebauer votes aye. Mr. Inglis?
 [No response.]
 The CLERK. Mr. McCaul?
 [No response.]
 The CLERK. Mr. Diaz-Balart?
 Mr. DIAZ-BALART. Aye.
 The CLERK. Mr. Diaz-Balart votes aye. Mr. Bilbray?
 Mr. BILBRAY. Aye.
 The CLERK. Mr. Bilbray votes aye. Mr. Adrian Smith?
 Mr. SMITH OF NEBRASKA. Aye.
 The CLERK. Mr. Adrian Smith votes aye. Mr. Broun?
 Mr. BROUN. Aye.
 The CLERK. Mr. Broun votes aye. Mr. Olson?
 Mr. OLSON. Aye.
 The CLERK. Mr. Olson votes aye.
 Chairman GORDON. Is there anyone who has not been recorded?
 Mr. Costello?
 Mr. COSTELLO. No.
 The CLERK. Mr. Costello votes no.
 Chairman GORDON. Dr. Baird?
 Mr. BAIRD. No.
 The CLERK. Mr. Baird votes no.
 Chairman GORDON. Mr. Chandler?
 Mr. CHANDLER. No.
 The CLERK. Mr. Chandler votes no.
 Chairman GORDON. Ms. Giffords?
 Ms. GIFFORDS. No.

The CLERK. Ms.—

Chairman GORDON. Mr. Carnahan?

Mr. CARNAHAN. No.

Chairman GORDON. If there is no one else, the clerk will tally the vote, following which there are two additional votes that—I mean two additional amendments that should be accepted.

The CLERK. Mr. Chairman, nine members vote aye and 25 members vote no.

COMMITTEE ON SCIENCE AND TECHNOLOGY - 111th

DATE 4-28-10 AMENDMENT NO. 49 ROLL CALL NO. 6_
 Bill: H. R. 5116 - America COMPETES
 Reauthorization Act of 2010
 SPONSOR of AMEND - Mr. Broun 028

PASSED VOICE VOTE
 DEFEATED ✓ WITHDRAWN

Quorum - 15 to vote - 22 to report

	MEMBER	AYE	NO	PRESENT	NOT VOTING
1	Mr. GORDON, Chair		✓		
2	Mr. COSTELLO - IL		✓		
3	Ms. JOHNSON - TX		✓		
4	Ms. WOOLSEY - CA		✓		
5	Mr. WU - OR		✓		
6	Mr. BAIRD - WA		✓		
7	Mr. MILLER - NC		✓		
8	Mr. LIPINSKI - IL		✓		
9	Ms. GIFFORDS - AZ		✓		
10	Ms. EDWARDS - MD		✓		
11	Ms. FUDGE - OH		✓		
12	Mr. LUJÁN - NM		✓		
13	Mr. TONKO - NY		✓		
14	Mr. GARAMENDI, CA		✓		
15	Mr. ROTHMAN - IN				
16	Mr. MATHESON - UT		✓		
17	Mr. DAVIS - TN		✓		
18	Mr. CHANDLER - KY		✓		
19	Mr. CARNAHAN - MO		✓		
20	Mr. HILL - IN		✓		
21	Mr. MITCHELL - AZ		✓		
22	Mr. WILSON - OH				
23	Mrs. DAHLKEMPER - PA		✓		
24	Mr. GRAYSON - FL		✓		
25	Ms. KOSMAS - FL		✓		
26	Mr. PETERS - MI		✓		
27	Vacancy				
1	Mr. HALL - TX	✓			
2	Mr. SENSENBRENNER - WI				
3	Mr. LAMAR SMITH - TX				
4	Mr. ROHRBACHER - CA	✓			
5	Mr. BARTLETT - MD				
6	Mr. EHLERS - MI				
7	Mr. LUCAS - OK	✓			
8	Mrs. BIGGERT - IL		✓		
9	Mr. AKIN - MO				
10	Mr. NEUGEBAUER - TX	✓			
11	Mr. INGLIS - SC				
12	Mr. McCAUL - TX				
13	Mr. DIAZ-BALART - FL	✓			
14	Mr. BILBRAY - CA	✓			
15	Mr. ADRIAN SMITH - NE	✓			
16	Mr. BROUN - GA	✓			
17	Mr. OLSON - TX	✓			
	TOTALS	9	25		

Chairman GORDON. The amendment is not accepted. The next amendment on the roster is an amendment offered by the gentleman from California, Mr. Bilbray, along with the gentleman from California, Mr. Garamendi.

Mr. BILBRAY. Mr. Chairman, I would ask that you recognize the gentleman from California to present the—this amendment.

Chairman GORDON. The clerk will report the amendment.

The CLERK. Amendment number 042, amendment to the amendment in the nature of a substitute offered by Mr. Bilbray of California and Mr. Garamendi of California.

Chairman GORDON. I ask unanimous consent to dispense with the reading. Without objection, so ordered. There—I recognize the gentleman for five minutes to explain the amendment.

Mr. GARAMENDI. Mr. Chairman and Members, this amendment would direct the Department to engage in fusion research. Reliable, safe, sustainable, it adds one additional new program, which I would suggest the previous amendment would not have allowed. But, here we got with a new program that I think is very important. Nuclear power, in all of its various forms, are part of the solutions for the future. I ask for an aye vote.

Chairman GORDON. If there is no further discussion after that articulate presentation, then the—all those in favor of the amendment, say aye. Opposed no. The motion is—or the amendment is accepted. The final amendment is an amendment by Dr. Bartlett, who will be introduced by Mr. Hall.

Mr. HALL. —all new programs, then you put in an amendment for a new program. Why not?

Chairman GORDON. Are you ready to proceed, Mr. Hall?

Mr. HALL. I am ready to proceed, and I have an amendment in front of me.

Chairman GORDON. The clerk will report the amendment.

The CLERK. Amendment number 021, amendment to the amendment in the nature of a substitute offered by Mr. Bartlett of Maryland.

Chairman GORDON. I ask unanimous consent to dispense with the reading. Without objection, so ordered. I recognize the gentleman for five minutes to explain the amendment.

Mr. HALL. I will not take five minutes. This amendment is needed to reflect the intent of ARPA-E's Director. This amendment clarifies that funding for events, such as those for grants, finalists, and other outreach programs would be taken from the five percent set aside for tech transfers.

Chairman GORDON. Very well said. If there is no further amendment—or no further discussion, the vote is on the motion—or on the amendment. All in favor, say aye. Opposed no. The ayes have it. The amendment is agreed to. Are there any other amendments? If no, then the vote is on the amendment on the nature of a substitute on H.R. 5116, as amended. All those in favor would say aye. All those opposed, say no. In the opinion of the Chair, the ayes have it.

Mr. HALL. Mr. Chairman—

Chairman GORDON. Do you want a vote—

Mr. HALL. —on that, I would ask to—

Chairman GORDON. You want to do this one a little bit later?

Mr. HALL. I withdraw anything I have said in the last 30 seconds.

Chairman GORDON. All right. The vote is on the bill as amended. All those in favor will say aye. All those opposed will say no. In the opinion of the Chair, the ayes have it. Did—Mr.—did you like to—Mr. Hall?

Mr. HALL. Mr. Chairman, I am going to ask for a recorded vote.

Chairman GORDON. The clerk will call the roll.

The CLERK. Chairman Gordon?

Chairman GORDON. Aye.

The CLERK. Chairman Gordon votes aye. Mr. Costello?

Mr. COSTELLO. Aye.

The CLERK. Mr. Costello votes aye. Ms. Johnson?

Ms. JOHNSON. Aye.

The CLERK. Ms. Johnson votes aye. Ms. Woolsey?

Ms. WOOLSEY. Aye.

The CLERK. Ms. Woolsey votes aye. Mr. Wu?

Mr. WU. Aye.

The CLERK. Mr. Wu votes aye. Mr. Baird?

Mr. BAIRD. Consistent with the wishes of the American Chamber of Congress, the National Association of Manufacturers, and a host of others—I will vote aye.

The CLERK. Mr. Baird votes aye. Mr. Miller?

Mr. MILLER. Why not?

The CLERK. Mr. Miller votes aye. Mr. Lipinski?

Mr. LIPINSKI. Aye.

The CLERK. Mr. Lipinski votes aye. Ms. Giffords?

Ms. GIFFORDS. Aye.

The CLERK. Ms. Giffords votes aye. Ms. Edwards?

Ms. EDWARDS. Aye.

The CLERK. Ms. Edwards votes aye. Ms. Fudge?

Ms. FUDGE. Aye.

The CLERK. Ms. Fudge votes aye. Mr. Luján?

Mr. LUJÁN. Aye.

The CLERK. Mr. Luján votes aye. Mr. Tonko?

Mr. TONKO. Aye.

The CLERK. Mr. Tonko votes aye. Mr. Garamendi?

Mr. GARAMENDI. Aye.

The CLERK. Mr. Garmendi votes aye. Mr. Rothman?

[No response.]

The CLERK. Mr. Matheson?

Mr. MATHESON. Aye.

The CLERK. Mr. Matheson votes aye. Mr. Davis?

Mr. DAVIS. Aye.

The CLERK. Mr. Davis votes aye. Mr. Chandler?

Mr. CHANDLER. Aye.

The CLERK. Mr. Chandler votes aye. Mr. Carnahan?

Mr. CARNAHAN. Aye.

The CLERK. Mr. Carnahan votes aye. Mr. Hill?

Mr. HILL. Aye.

The CLERK. Mr. Hill votes aye. Mr. Mitchell?

Mr. MITCHELL. Aye.

The CLERK. Mr. Mitchell votes aye. Mr. Wilson?

[No response.]

The CLERK. Mrs. Dahlkemper?
 Mrs. DAHLKEMPER. [No audible response.]
 The CLERK. Mrs. Dahlkemper votes aye. Mr. Grayson?
 Mr. GRAYSON. Aye.
 The CLERK. Mr. Grayson votes aye. Ms. Kosmas?
 Ms. KOSMAS. Aye.
 The CLERK. Ms. Kosmas votes aye. Mr. Peters?
 Mr. PETERS. Aye.
 The CLERK. Mr. Peters votes aye. Mr. Hall?
 Mr. HALL. No.
 The CLERK. Mr. Hall votes no. Mr. Sensenbrenner?
 [No response.]
 The CLERK. Mr. Lamar Smith?
 [No response.]
 The CLERK. Mr. Rohrabacher?
 Mr. ROHRABACHER. No.
 The CLERK. Mr. Rohrabacher votes no. Mr. Bartlett?
 [No response.]
 The CLERK. Mr. Ehlers?
 Mr. EHLERS. Aye.
 The CLERK. Mr. Ehlers votes aye. Mr. Lucas?
 Mr. LUCAS. No.
 The CLERK. Mr. Lucas votes no. Mrs. Biggert?
 Mrs. BIGGERT. Aye.
 The CLERK. Mrs. Biggert votes aye. Mr. Akin?
 [No response.]
 The CLERK. Is he here? Mr. Neugebauer?
 Mr. NEUGEBAUER. No.
 The CLERK. Mr. Neugebauer votes no. Mr. Inglis?
 Mr. INGLIS. Aye.
 The CLERK. Mr. Inglis votes aye. Mr. McCaul?
 Mr. MCCAUL. Aye.
 The CLERK. Mr. McCaul votes aye. Mr. Diaz-Balart?
 Mr. DIAZ-BALART. No.
 The CLERK. Mr. Diaz-Balart votes no. Mr. Bilbray?
 Mr. BILBRAY. Despite the Chamber of Commerce position,
 Bilbray votes aye.
 The CLERK. Mr. Bilbray votes aye. Mr. Adrian Smith?
 Mr. SMITH OF NEBRASKA. No..
 The CLERK. Mr. Adrian Smith votes no. Mr. Broun?
 Mr. BROUN. No.
 The CLERK. Mr. Broun votes no. Mr. Olson?
 Mr. OLSON. No.
 The CLERK. Mr. Olson votes no.
 Chairman GORDON. Is there anyone who was not recorded? If
 not, the clerk will report.
 Ms. WOOLSEY. Mr. Chairman, while they are counting, can I say
 something?
 Chairman GORDON. Yes, Ms. Woolsey.
 Ms. WOOLSEY. We are very proud of you. Thank you very much.
 Chairman GORDON. Thank you. I just keep, you know, this is not
 a eulogy. I am not dead yet. We have more to do.
 The CLERK. Mr. Chairman, 31 members vote aye and six mem-
 bers vote no.

Chairman GORDON. The bill—the ayes have it. The motion is carried. I recognize myself to offer a motion. I move the committee favorably report H.R. 5116, as amended, to the House, with the recommendation that the bill does pass. Furthermore, I move that the staff be instructed to prepare the legislative report and to make necessary technical and conforming changes, and that the Chairman take all the necessary steps to bring the bill before the House for consideration. The question is on the motion to report the bill favorably. Those in favor of the motion will signify by saying aye. Opposed no. The ayes have it, and the bill is favorably reported. Let me just—if there is a question about that vote, how do—do you want to resolve that?

The CLERK. I can—

Chairman GORDON. Let us recount. Let us be absolutely sure.

The CLERK. Mr. Chairman, 29 members vote aye, and seven—and eight members vote no.

Chairman GORDON. Okay. Let us—say it again, please, so we all know.

The CLERK. 29 vote aye and eight—

COMMITTEE ON SCIENCE AND TECHNOLOGY - 111th

DATE 4-28-10 AMENDMENT NO. ROLL CALL NO._7_
 Bill: H. R. 5116 – America COMPETES
 Reauthorization Act of 2010
 SPONSOR of AMEND – FINAL VOTE

PASSED ✓ VOICE VOTE
 DEFEATED WITHDRAWN

Quorum – 15 to vote – 22 to report

	MEMBER	AYE	NO	PRESENT	NOT VOTING
1	Mr. GORDON, Chair	✓			
2	Mr. COSTELLO - IL	✓			
3	Ms. JOHNSON - TX	✓			
4	Ms. WOOLSEY - CA	✓			
5	Mr. WU - OR	✓			
6	Mr. BAIRD - WA	✓			
7	Mr. MILLER - NC	✓			
8	Mr. LIPINSKI - IL	✓			
9	Ms. GIFFORDS - AZ	✓			
10	Ms. EDWARDS - MD	✓			
11	Ms. FUDGE - OH	✓			
12	Mr. LUJÁN - NM	✓			
13	Mr. TONKO - NY	✓			
14	Mr. GARAMENDI, CA	✓			
15	Mr. ROTHMAN - NJ				
16	Mr. MATHESON - UT	✓			
17	Mr. DAVIS - TN	✓			
18	Mr. CHANDLER - KY	✓			
19	Mr. CARNAHAN - MO	✓			
20	Mr. HILL - IN	✓			
21	Mr. MITCHELL - AZ	✓			
22	Mr. WILSON - OH				
23	Mrs. DAHLKEMPER - PA	✓			
24	Mr. GRAYSON - FL	✓			
25	Ms. KOSMAS - FL	✓			
26	Mr. PETERS - MI	✓			
27	Vacancy				
1	Mr. HALL - TX		✓		
2	Mr. SENSENBRENNER - WI				
3	Mr. LAMAR SMITH - TX				
4	Mr. ROHRBACHER - CA		✓		
5	Mr. BARTLETT - MD				
6	Mr. EHLERS - MI	✓			
7	Mr. LUCAS - OK		✓		
8	Mrs. BIGGERT - IL	✓			
9	Mr. AKIN - MO				
10	Mr. NEUGEBAUER - TX		✓		
11	Mr. INGLIS - SC	✓			
12	Mr. McCAUL - TX	✓			
13	Mr. DIAZ-BALART - FL		✓		
14	Mr. BILBRAY - CA	✓			
15	Mr. ADRIAN SMITH - NE		✓		
16	Mr. BROUN - GA		✓		
17	Mr. OLSON - TX		✓		
	TOTALS	29	8		

Chairman GORDON. Is that—okay. All right. Thanks for the oversight on that. I am glad that we could get it correct. The ayes have it, and the bill is favorably reported. Without objection, the motion is considered to be laid on the table. Members will have two subsequent calendar days in which to submit supplemental, Minority and additional views on the measure. Before we adjourn, let me thank everybody very sincerely. It has been a long day. You have been a part of history, and I very much appreciate you being here. And I want thank—now we conclude this markup.

[Whereupon, at 6:55 p.m., the Committee was adjourned.]

Appendix:

H.R. 5116, SECTION-BY-SECTION ANALYSIS, AMENDMENT ROSTER



I

111TH CONGRESS
2D SESSION

H. R. 5116

To invest in innovation through research and development, to improve the competitiveness of the United States, and for other purposes.

IN THE HOUSE OF REPRESENTATIVES

APRIL 22, 2010

Mr. GORDON of Tennessee introduced the following bill; which was referred to the Committee on Science and Technology, and in addition to the Committee on Education and Labor, for a period to be subsequently determined by the Speaker, in each case for consideration of such provisions as fall within the jurisdiction of the committee concerned

A BILL

To invest in innovation through research and development, to improve the competitiveness of the United States, and for other purposes.

1 *Be it enacted by the Senate and House of Representa-*
2 *tives of the United States of America in Congress assembled,*

3 **SECTION 1. SHORT TITLE; TABLE OF CONTENTS.**

4 (a) **SHORT TITLE.**—This Act may be cited as the
5 “America COMPETES Reauthorization Act of 2010”.

6 (b) **TABLE OF CONTENTS.**—The table of contents for
7 this Act is as follows:

Sec. 1. Short title: table of contents.

TITLE I—SCIENCE AND TECHNOLOGY POLICY

Subtitle A—National Nanotechnology Initiative Amendments

- Sec. 101. Short title.
- Sec. 102. National Nanotechnology Program amendments.
- Sec. 103. Societal dimensions of nanotechnology.
- Sec. 104. Technology transfer.
- Sec. 105. Research in areas of national importance.
- Sec. 106. Nanomanufacturing research.
- Sec. 107. Definitions.

Subtitle B—Networking and Information Technology Research and Development

- Sec. 111. Short title.
- Sec. 112. Program planning and coordination.
- Sec. 113. Large-scale research in areas of national importance.
- Sec. 114. Cyber-physical systems and information management.
- Sec. 115. National Coordination Office.
- Sec. 116. Improving networking and information technology education.
- Sec. 117. Conforming and technical amendments.

Subtitle C—Other OSTP Provisions

- Sec. 121. Federal scientific collections.
- Sec. 122. Coordination of manufacturing research and development.
- Sec. 123. Interagency public access committee.

TITLE II—NATIONAL SCIENCE FOUNDATION

- Sec. 201. Short title.

Subtitle A—General Provisions

- Sec. 211. Definitions.
- Sec. 212. Authorization of appropriations.
- Sec. 213. National Science Board administrative amendments.
- Sec. 214. Broader impacts review criterion.
- Sec. 215. National Center for Science and Engineering Statistics.

Subtitle B—Research and Innovation

- Sec. 221. Support for potentially transformative research.
- Sec. 222. Facilitating interdisciplinary collaborations for national needs.
- Sec. 223. National Science Foundation manufacturing research.
- Sec. 224. Strengthening institutional research partnerships.
- Sec. 225. National Science Board report on mid-scale instrumentation.
- Sec. 226. Sense of Congress on overall support for research infrastructure at the Foundation.
- Sec. 227. Partnerships for innovation.
- Sec. 228. Prize awards.

Subtitle C—STEM Education and Workforce Training

- Sec. 241. Graduate student support.
- Sec. 242. Postdoctoral fellowship in STEM education research.
- Sec. 243. Robert Noyce Teacher Scholarship Program.

- Sec. 244. Institutions serving persons with disabilities.
- Sec. 245. Institutional integration.
- Sec. 246. Postdoctoral research fellowships.
- Sec. 247. Broadening participation training and outreach.
- Sec. 248. Transforming undergraduate education in STEM.
- Sec. 249. 21st century graduate education.
- Sec. 250. Undergraduate Broadening Participation Program.
- Sec. 251. Grand challenges in education research.
- Sec. 252. Research experiences for undergraduates.

TITLE III—STEM EDUCATION

- Sec. 301. Coordination of Federal STEM education.
- Sec. 302. Advisory committee on STEM education.
- Sec. 303. STEM education at the Department of Energy.

TITLE IV—NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY

- Sec. 401. Short title.
- Sec. 402. Authorization of appropriations.
- Sec. 403. Under Secretary of Commerce for Standards and Technology.
- Sec. 404. Reorganization of NIST laboratories.
- Sec. 405. Federal Government standards and conformity assessment coordination.
- Sec. 406. Manufacturing extension partnership.
- Sec. 407. Bioscience Research Program.
- Sec. 408. TIP Advisory Board.
- Sec. 409. Underrepresented minorities.
- Sec. 410. Cyber security standards and guidelines.
- Sec. 411. Definitions.

TITLE V—INNOVATION

- Sec. 501. Office of Innovation and Entrepreneurship.
- Sec. 502. Federal loan guarantees for innovative technologies in manufacturing.
- Sec. 503. Regional Innovation Program.

TITLE VI—DEPARTMENT OF ENERGY

Subtitle A—Office of Science

- Sec. 601. Short title.
- Sec. 602. Definitions.
- Sec. 603. Mission of the Office of Science.
- Sec. 604. Basic Energy Sciences Program.
- Sec. 605. Biological and Environmental Research Program.
- Sec. 606. Advanced Scientific Computing Research Program.
- Sec. 607. Fusion Energy Research Program.
- Sec. 608. High Energy Physics Program.
- Sec. 609. Nuclear Physics Program.
- Sec. 610. Science Laboratories Infrastructure Program.
- Sec. 611. Authorization of appropriations.

Subtitle B—Advanced Research Projects Agency—Energy

- Sec. 621. Short title.
- Sec. 622. ARPA-E amendments.

Subtitle C—Energy Innovation Hubs

Sec. 631. Short title.

Sec. 632. Energy Innovation Hubs.

1 **TITLE I—SCIENCE AND**
2 **TECHNOLOGY POLICY**
3 **Subtitle A—National Nanotechnol-**
4 **ogy Initiative Amendments**

5 **SEC. 101. SHORT TITLE.**

6 This subtitle may be cited as the “National Nano-
7 technology Initiative Amendments Act of 2010”.

8 **SEC. 102. NATIONAL NANOTECHNOLOGY PROGRAM AMEND-**
9 **MENTS.**

10 The 21st Century Nanotechnology Research and De-
11 velopment Act (15 U.S.C. 7501 et seq.) is amended—

12 (1) by striking section 2(c)(4) and inserting the
13 following new paragraph:

14 “(4) develop, within 12 months after the date
15 of enactment of the National Nanotechnology Initia-
16 tive Amendments Act of 2010, and update every 3
17 years thereafter, a strategic plan to guide the activi-
18 ties described under subsection (b) that specifies
19 near-term and long-term objectives for the Program,
20 the anticipated time frame for achieving the near-
21 term objectives, and the metrics to be used for as-
22 sessing progress toward the objectives, and that de-
23 scribes—

1 “(A) how the Program will move results
2 out of the laboratory and into applications for
3 the benefit of society, including through co-
4 operation and collaborations with nanotechnol-
5 ogy research, development, and technology tran-
6 sition initiatives supported by the States;

7 “(B) how the Program will encourage and
8 support interdisciplinary research and develop-
9 ment in nanotechnology; and

10 “(C) proposed research in areas of national
11 importance in accordance with the requirements
12 of section 105 of the National Nanotechnology
13 Initiative Amendments Act of 2010;”;

14 (2) in section 2—

15 (A) in subsection (d)—

16 (i) by redesignating paragraphs (1)
17 through (5) as paragraphs (2) through (6),
18 respectively; and

19 (ii) by inserting the following new
20 paragraph before paragraph (2), as so re-
21 designated by clause (i) of this subpara-
22 graph:

23 “(1) the Program budget, for the previous fiscal
24 year, for each agency that participates in the Pro-
25 gram, including a breakout of spending for the de-

1 development and acquisition of research facilities and
2 instrumentation, for each program component area
3 and for all activities pursuant to subsection
4 (b)(10);” and

5 (B) by inserting at the end the following
6 new subsection:

7 “(e) STANDARDS SETTING.—The agencies partici
8 pating in the Program shall support the activities of com
9 mittees involved in the development of standards for nanoc
10 technology and may reimburse the travel costs of scientist
11 and engineers who participate in activities of such commit
12 tees.”;

13 (3) by striking section 3(b) and inserting th
14 following new subsection:

15 “(b) FUNDING.—(1) The operation of the Nationa
16 Nanotechnology Coordination Office shall be supported b
17 funds from each agency participating in the Program. Th
18 portion of such Office’s total budget provided by eac
19 agency for each fiscal year shall be in the same proportio
20 as the agency’s share of the total budget for the Program
21 for the previous fiscal year, as specified in the report re
22 quired under section 2(d)(1).

23 “(2) The annual report under section 2(d) shall in
24 clude—

1 “(A) a description of the funding required by
2 the National Nanotechnology Coordination Office to
3 perform the functions specified under subsection (a)
4 for the next fiscal year by category of activity, in-
5 cluding the funding required to carry out the re-
6 quirements of section 2(b)(10)(D), subsection (d) of
7 this section, and section 5;

8 “(B) a description of the funding required by
9 such Office to perform the functions specified under
10 subsection (a) for the current fiscal year by category
11 of activity, including the funding required to carry
12 out the requirements of subsection (d); and

13 “(C) the amount of funding provided for such
14 Office for the current fiscal year by each agency par-
15 ticipating in the Program.”;

16 (4) by inserting at the end of section 3 the fol-
17 lowing new subsection:

18 “(d) PUBLIC INFORMATION.—(1) The National
19 Nanotechnology Coordination Office shall develop and
20 maintain a database accessible by the public of projects
21 funded under the Environmental, Health, and Safety, the
22 Education and Societal Dimensions, and the Nanomanu-
23 facturing program component areas, or any successor pro-
24 gram component areas, including a description of each
25 project, its source of funding by agency, and its funding

1 history. For the Environmental, Health, and Safety pro-
2 gram component area, or any successor program compo-
3 nent area, projects shall be grouped by major objective as
4 defined by the research plan required under section 103(b)
5 of the National Nanotechnology Initiative Amendments
6 Act of 2010. For the Education and Societal Dimensions
7 program component area, or any successor program com-
8 ponent area, the projects shall be grouped in subcategories
9 of—

10 “(A) education in formal settings;

11 “(B) education in informal settings;

12 “(C) public outreach; and

13 “(D) ethical, legal, and other societal issues.

14 “(2) The National Nanotechnology Coordination Of-
15 fice shall develop, maintain, and publicize information on
16 nanotechnology facilities supported under the Program,
17 and may include information on nanotechnology facilities
18 supported by the States, that are accessible for use by in-
19 dividuals from academic institutions and from industry.
20 The information shall include at a minimum the terms and
21 conditions for the use of each facility, a description of the
22 capabilities of the instruments and equipment available for
23 use at the facility, and a description of the technical sup-
24 port available to assist users of the facility.”;

25 (5) in section 4(a)—

1 (A) by striking “or designate”;

2 (B) by inserting “as a distinct entity”
3 after “Advisory Panel”; and

4 (C) by inserting at the end “The Advisory
5 Panel shall form a subpanel with membership
6 having specific qualifications tailored to enable
7 it to carry out the requirements of subsection
8 (c)(7).”;

9 (6) in section 4(b)—

10 (A) by striking “or designated” and “or
11 designating”; and

12 (B) by adding at the end the following:
13 “At least one member of the Advisory Panel
14 shall be an individual employed by and rep-
15 resenting a minority-serving institution.”;

16 (7) by amending section 5 to read as follows:

17 **“SEC. 5. TRIENNIAL EXTERNAL REVIEW OF THE NATIONAL**
18 **NANOTECHNOLOGY PROGRAM.**

19 “(a) IN GENERAL.—The Director of the National
20 Nanotechnology Coordination Office shall enter into an ar-
21 rangement with the National Research Council of the Na-
22 tional Academy of Sciences to conduct a triennial review
23 of the Program. The Director shall ensure that the ar-
24 rangement with the National Research Council is con-
25 cluded in order to allow sufficient time for the reporting

1 requirements of subsection (b) to be satisfied. Each tri-
2 ennial review shall include an evaluation of the—

3 “(1) research priorities and technical content of
4 the Program, including whether the allocation of
5 funding among program component areas, as des-
6 ignated according to section 2(c)(2), is appropriate;

7 “(2) effectiveness of the Program’s manage-
8 ment and coordination across agencies and dis-
9 ciplines, including an assessment of the effectiveness
10 of the National Nanotechnology Coordination Office;

11 “(3) Program’s scientific and technological ac-
12 complishments and its success in transferring tech-
13 nology to the private sector; and

14 “(4) adequacy of the Program’s activities ad-
15 dressing ethical, legal, environmental, and other ap-
16 propriate societal concerns, including human health
17 concerns.

18 “(b) EVALUATION TO BE TRANSMITTED TO CON-
19 GRESS.—The National Research Council shall document
20 the results of each triennial review carried out in accord-
21 ance with subsection (a) in a report that includes any rec-
22 ommendations for ways to improve the Program’s man-
23 agement and coordination processes and for changes to
24 the Program’s objectives, funding priorities, and technical
25 content. Each report shall be submitted to the Director

1 of the National Nanotechnology Coordination Office, who
2 shall transmit it to the Advisory Panel, the Committee on
3 Commerce, Science, and Transportation of the Senate,
4 and the Committee on Science and Technology of the
5 House of Representatives not later than September 30 of
6 every third year, with the first report due September 30,
7 2010.

8 “(c) FUNDING.—Of the amounts provided in accord-
9 ance with section 3(b)(1), the following amounts shall be
10 available to carry out this section:

11 “(1) \$500,000 for fiscal year 2010.

12 “(2) \$500,000 for fiscal year 2011.

13 “(3) \$500,000 for fiscal year 2012.”; and

14 (8) in section 10—

15 (A) by amending paragraph (2) to read as
16 follows:

17 “(2) NANOTECHNOLOGY.—The term ‘nanotech-
18 nology’ means the science and technology that will
19 enable one to understand, measure, manipulate, and
20 manufacture at the nanoscale, aimed at creating ma-
21 terials, devices, and systems with fundamentally new
22 properties or functions.”; and

23 (B) by adding at the end the following new
24 paragraph:

1 “(7) NANOSCALE.—The term ‘nanoscale’ means
2 one or more dimensions of between approximately 1
3 and 100 nanometers.”.

4 **SEC. 103. SOCIETAL DIMENSIONS OF NANOTECHNOLOGY.**

5 (a) COORDINATOR FOR SOCIETAL DIMENSIONS OF
6 NANOTECHNOLOGY.—The Director of the Office of
7 Science and Technology Policy shall designate an associate
8 director of the Office of Science and Technology Policy
9 as the Coordinator for Societal Dimensions of Nanotech-
10 nology. The Coordinator shall be responsible for oversight
11 of the coordination, planning, and budget prioritization of
12 activities required by section 2(b)(10) of the 21st Century
13 Nanotechnology Research and Development Act (15
14 U.S.C. 7501(b)(10)). The Coordinator shall, with the as-
15 sistance of appropriate senior officials of the agencies
16 funding activities within the Environmental, Health, and
17 Safety and the Education and Societal Dimensions pro-
18 gram component areas of the Program, or any successor
19 program component areas, ensure that the requirements
20 of such section 2(b)(10) are satisfied. The responsibilities
21 of the Coordinator shall include—

22 (1) ensuring that a research plan for the envi-
23 ronmental, health, and safety research activities re-
24 quired under subsection (b) is developed, updated,
25 and implemented and that the plan is responsive to

1 the recommendations of the subpanel of the Advi-
2 sory Panel established under section 4(a) of the 21st
3 Century Nanotechnology Research and Development
4 Act (15 U.S.C. 7503(a)), as amended by this sub-
5 title;

6 (2) encouraging and monitoring the efforts of
7 the agencies participating in the Program to allocate
8 the level of resources and management attention
9 necessary to ensure that the ethical, legal, environ-
10 mental, and other appropriate societal concerns re-
11 lated to nanotechnology, including human health
12 concerns, are addressed under the Program, includ-
13 ing the implementation of the research plan de-
14 scribed in subsection (b); and

15 (3) encouraging the agencies required to de-
16 velop the research plan under subsection (b) to iden-
17 tify, assess, and implement suitable mechanisms for
18 the establishment of public-private partnerships for
19 support of environmental, health, and safety re-
20 search.

21 (b) RESEARCH PLAN.—

22 (1) IN GENERAL.—The Coordinator for Societal
23 Dimensions of Nanotechnology shall convene and
24 chair a panel comprised of representatives from the
25 agencies funding research activities under the Envi-

1 ronmental, Health, and Safety program component
2 area of the Program, or any successor program com-
3 ponent area, and from such other agencies as the
4 Coordinator considers necessary to develop, periodi-
5 cally update, and coordinate the implementation of
6 a research plan for this program component area. In
7 developing and updating the plan, the panel con-
8 vened by the Coordinator shall solicit and be respon-
9 sive to recommendations and advice from—

10 (A) the subpanel of the Advisory Panel es-
11 tablished under section 4(a) of the 21st Cen-
12 tury Nanotechnology Research and Develop-
13 ment Act (15 U.S.C. 7503(a)), as amended by
14 this subtitle; and

15 (B) the agencies responsible for environ-
16 mental, health, and safety regulations associ-
17 ated with the production, use, and disposal of
18 nanoscale materials and products.

19 (2) DEVELOPMENT OF STANDARDS.—The plan
20 required under paragraph (1) shall include a de-
21 scription of how the Program will help to ensure the
22 development of—

23 (A) standards related to nomenclature as-
24 sociated with engineered nanoscale materials;

1 (B) engineered nanoscale standard ref-
2 erence materials for environmental, health, and
3 safety testing; and

4 (C) standards related to methods and pro-
5 cedures for detecting, measuring, monitoring,
6 sampling, and testing engineered nanoscale ma-
7 terials for environmental, health, and safety im-
8 pacts.

9 (3) COMPONENTS OF PLAN.—The plan required
10 under paragraph (1) shall, with respect to activities
11 described in paragraphs (1) and (2)—

12 (A) specify near-term research objectives
13 and long-term research objectives;

14 (B) specify milestones associated with each
15 near-term objective and the estimated time and
16 resources required to reach each milestone;

17 (C) with respect to subparagraphs (A) and
18 (B), describe the role of each agency carrying
19 out or sponsoring research in order to meet the
20 objectives specified under subparagraph (A) and
21 to achieve the milestones specified under sub-
22 paragraph (B);

23 (D) specify the funding allocated to each
24 major objective of the plan and the source of

1 funding by agency for the current fiscal year;
2 and

3 (E) estimate the funding required for each
4 major objective of the plan and the source of
5 funding by agency for the following 3 fiscal
6 years.

7 (4) TRANSMITTAL TO CONGRESS.—The plan re-
8 quired under paragraph (1) shall be submitted not
9 later than 60 days after the date of enactment of
10 this Act to the Committee on Commerce, Science,
11 and Transportation of the Senate and the Com-
12 mittee on Science and Technology of the House of
13 Representatives.

14 (5) UPDATING AND APPENDING TO REPORT.—
15 The plan required under paragraph (1) shall be up-
16 dated annually and appended to the report required
17 under section 2(d) of the 21st Century Nanotechnol-
18 ogy Research and Development Act (15 U.S.C.
19 7501(d)).

20 (c) NANOTECHNOLOGY PARTNERSHIPS.—

21 (1) ESTABLISHMENT.—As part of the program
22 authorized by section 9 of the National Science
23 Foundation Authorization Act of 2002, the Director
24 of the National Science Foundation shall provide 1
25 or more grants to establish partnerships as defined

1 by subsection (a)(2) of that section, except that each
2 such partnership shall include 1 or more businesses
3 engaged in the production of nanoscale materials,
4 products, or devices. Partnerships established in ac-
5 cordance with this subsection shall be designated as
6 “Nanotechnology Education Partnerships”.

7 (2) PURPOSE.—Nanotechnology Education
8 Partnerships shall be designed to recruit and help
9 prepare secondary school students to pursue postsec-
10 ondary level courses of instruction in nanotechnol-
11 ogy. At a minimum, grants shall be used to sup-
12 port—

13 (A) professional development activities to
14 enable secondary school teachers to use cur-
15 ricular materials incorporating nanotechnology
16 and to inform teachers about career possibilities
17 for students in nanotechnology;

18 (B) enrichment programs for students, in-
19 cluding access to nanotechnology facilities and
20 equipment at partner institutions, to increase
21 their understanding of nanoscale science and
22 technology and to inform them about career
23 possibilities in nanotechnology as scientists, en-
24 gineers, and technicians; and

1 (C) identification of appropriate nanotech-
2 nology educational materials and incorporation
3 of nanotechnology into the curriculum for sec-
4 ondary school students at one or more organiza-
5 tions participating in a Partnership.

6 (3) SELECTION.—Grants under this subsection
7 shall be awarded in accordance with subsection (b)
8 of such section 9, except that paragraph (3)(B) of
9 that subsection shall not apply.

10 (d) UNDERGRADUATE EDUCATION PROGRAMS.—

11 (1) ACTIVITIES SUPPORTED.—As part of the
12 activities included under the Education and Societal
13 Dimensions program component area, or any suc-
14 cessor program component area, the Program shall
15 support efforts to introduce nanoscale science, engi-
16 neering, and technology into undergraduate science
17 and engineering education through a variety of
18 interdisciplinary approaches. Activities supported
19 may include—

20 (A) development of courses of instruction
21 or modules to existing courses;

22 (B) faculty professional development; and

23 (C) acquisition of equipment and instru-
24 mentation suitable for undergraduate education
25 and research in nanotechnology.

1 (2) COURSE, CURRICULUM, AND LABORATORY
2 IMPROVEMENT AUTHORIZATION.—There are author-
3 ized to be appropriated to the Director of the Na-
4 tional Science Foundation to carry out activities de-
5 scribed in paragraph (1) through the Course, Cur-
6 riculum, and Laboratory Improvement program
7 from amounts authorized under section
8 7002(c)(2)(B) of the America COMPETES Act,
9 \$5,000,000 for fiscal year 2010.

10 (3) ADVANCED TECHNOLOGY EDUCATION AU-
11 THORIZATION.—There are authorized to be appro-
12 priated to the Director of the National Science
13 Foundation to carry out activities described in para-
14 graph (1) through the Advanced Technology Edu-
15 cation program from amounts authorized under sec-
16 tion 7002(c)(2)(B) of the America COMPETES Act,
17 \$5,000,000 for fiscal year 2010.

18 (e) INTERAGENCY WORKING GROUP.—The National
19 Science and Technology Council shall establish under the
20 Nanoscale Science, Engineering, and Technology Sub-
21 committee an Education Working Group to coordinate,
22 prioritize, and plan the educational activities supported
23 under the Program.

24 (f) SOCIETAL DIMENSIONS IN NANOTECHNOLOGY
25 EDUCATION ACTIVITIES.—Activities supported under the

1 Education and Societal Dimensions program component
2 area, or any successor program component area, that in-
3 volve informal, precollege, or undergraduate nanotechnol-
4 ogy education shall include education regarding the envi-
5 ronmental, health and safety, and other societal aspects
6 of nanotechnology.

7 (g) REMOTE ACCESS TO NANOTECHNOLOGY FACILI-
8 TIES.—(1) Agencies supporting nanotechnology research
9 facilities as part of the Program shall require the entities
10 that operate such facilities to allow access via the Internet,
11 and support the costs associated with the provision of such
12 access, by secondary school students and teachers, to in-
13 struments and equipment within such facilities for edu-
14 cational purposes. The agencies may waive this require-
15 ment for cases when particular facilities would be inappro-
16 priate for educational purposes or the costs for providing
17 such access would be prohibitive.

18 (2) The agencies identified in paragraph (1) shall re-
19 quire the entities that operate such nanotechnology re-
20 search facilities to establish and publish procedures, guide-
21 lines, and conditions for the submission and approval of
22 applications for the use of the facilities for the purpose
23 identified in paragraph (1) and shall authorize personnel
24 who operate the facilities to provide necessary technical
25 support to students and teachers.

1 **SEC. 104. TECHNOLOGY TRANSFER.**

2 (a) PROTOTYPING.—

3 (1) ACCESS TO FACILITIES.—In accordance
4 with section 2(b)(7) of 21st Century Nanotechnology
5 Research and Development Act (15 U.S.C.
6 7501(b)(7)), the agencies supporting nanotechnology
7 research facilities as part of the Program shall pro-
8 vide access to such facilities to companies for the
9 purpose of assisting the companies in the develop-
10 ment of prototypes of nanoscale products, devices, or
11 processes (or products, devices, or processes enabled
12 by nanotechnology) for determining proof of concept.
13 The agencies shall publicize the availability of these
14 facilities and encourage their use by companies as
15 provided for in this section.

16 (2) PROCEDURES.—The agencies identified in
17 paragraph (1)—

18 (A) shall establish and publish procedures,
19 guidelines, and conditions for the submission
20 and approval of applications for use of nano-
21 technology facilities;

22 (B) shall publish descriptions of the capa-
23 bilities of facilities available for use under this
24 subsection, including the availability of tech-
25 nical support; and

1 (C) may waive recovery, require full recovery,
2 ery, or require partial recovery of the costs associated
3 with use of the facilities for projects
4 under this subsection.

5 (3) SELECTION AND CRITERIA.—In cases when
6 less than full cost recovery is required pursuant to
7 paragraph (2)(C), projects provided access to nano-
8 technology facilities in accordance with this subsection
9 shall be selected through a competitive,
10 merit-based process, and the criteria for the selection
11 of such projects shall include at a minimum—

12 (A) the readiness of the project for technology
13 demonstration;

14 (B) evidence of a commitment by the applicant
15 for further development of the project to full commercialization
16 if the proof of concept is established by the prototype; and
17

18 (C) evidence of the potential for further
19 funding from private sector sources following the successful
20 demonstration of proof of concept.
21

22 The agencies may give special consideration in selecting
23 projects to applications that are relevant to
24 important national needs or requirements.

1 (b) USE OF EXISTING TECHNOLOGY TRANSFER PRO-
2 GRAMS.—

3 (1) PARTICIPATING AGENCIES.—Each agency
4 participating in the Program shall—

5 (A) encourage the submission of applica-
6 tions for support of nanotechnology related
7 projects to the Small Business Innovation Re-
8 search Program and the Small Business Tech-
9 nology Transfer Program administered by such
10 agencies; and

11 (B) through the National Nanotechnology
12 Coordination Office and within 6 months after
13 the date of enactment of this Act, submit to the
14 Committee on Commerce, Science, and Trans-
15 portation of the Senate and the Committee on
16 Science and Technology of the House of Rep-
17 resentatives—

18 (i) the plan described in section
19 2(c)(7) of the 21st Century Nanotechnol-
20 ogy Research and Development Act (15
21 U.S.C. 7501(c)(7)); and

22 (ii) a report specifying, if the agency
23 administers a Small Business Innovation
24 Research Program and a Small Business
25 Technology Transfer Program—

1 (I) the number of proposals re-
2 ceived for nanotechnology related
3 projects during the current fiscal year
4 and the previous 2 fiscal years;

5 (II) the number of such pro-
6 posals funded in each year;

7 (III) the total number of nano-
8 technology related projects funded and
9 the amount of funding provided for
10 fiscal year 2004 through fiscal year
11 2008; and

12 (IV) a description of the projects
13 identified in accordance with sub-
14 clause (III) which received private sec-
15 tor funding beyond the period of
16 phase II support.

17 (2) NATIONAL INSTITUTE OF STANDARDS AND
18 TECHNOLOGY.—The Director of the National Insti-
19 tute of Standards and Technology in carrying out
20 the requirements of section 28 of the National Insti-
21 tute of Standards and Technology Act (15 U.S.C.
22 278n) shall—

23 (A) in regard to subsection (d) of that sec-
24 tion, encourage the submission of proposals for
25 support of nanotechnology related projects; and

1 (B) in regard to subsection (g) of that sec-
2 tion, include a description of how the require-
3 ment of subparagraph (A) of this paragraph is
4 being met, the number of proposals for nano-
5 technology related projects received, the number
6 of such proposals funded, the total number of
7 such projects funded since the beginning of the
8 Technology Innovation Program, and the out-
9 comes of such funded projects in terms of the
10 metrics developed in accordance with such sub-
11 section (g).

12 (3) TIP ADVISORY BOARD.—The TIP Advisory
13 Board established under section 28(k) of the Na-
14 tional Institute of Standards and Technology Act
15 (15 U.S.C. 278n(k)), in carrying out its responsibil-
16 ities under subsection (k)(3), shall provide the Di-
17 rector of the National Institute of Standards and
18 Technology with—

19 (A) advice on how to accomplish the re-
20 quirement of paragraph (2)(A) of this sub-
21 section; and

22 (B) an assessment of the adequacy of the
23 allocation of resources for nanotechnology re-
24 lated projects supported under the Technology
25 Innovation Program.

1 (c) INDUSTRY LIAISON GROUPS.—An objective of the
2 Program shall be to establish industry liaison groups for
3 all industry sectors that would benefit from applications
4 of nanotechnology. The Nanomanufacturing, Industry Li-
5 aison, and Innovation Working Group of the National
6 Science and Technology Council shall actively pursue es-
7 tablishing such liaison groups.

8 (d) COORDINATION WITH STATE INITIATIVES.—Sec-
9 tion 2(b)(5) of the 21st Century Nanotechnology Research
10 and Development Act (15 U.S.C. 7501(b)(5)) is amended
11 to read as follows:

12 “(5) ensuring United States global leadership in
13 the development and application of nanotechnology,
14 including through coordination and leveraging Fed-
15 eral investments with nanotechnology research, de-
16 velopment, and technology transition initiatives sup-
17 ported by the States;”.

18 **SEC. 105. RESEARCH IN AREAS OF NATIONAL IMPORTANCE.**

19 (a) IN GENERAL.—The Program shall include sup-
20 port for nanotechnology research and development activi-
21 ties directed toward application areas that have the poten-
22 tial for significant contributions to national economic com-
23 petitiveness and for other significant societal benefits. The
24 activities supported shall be designed to advance the devel-
25 opment of research discoveries by demonstrating technical

1 solutions to important problems in such areas as nano-
2 electronics, energy efficiency, health care, and water reme-
3 diation and purification. The Advisory Panel shall make
4 recommendations to the Program for candidate research
5 and development areas for support under this section.

6 (b) CHARACTERISTICS.—

7 (1) IN GENERAL.—Research and development
8 activities under this section shall—

9 (A) include projects selected on the basis
10 of applications for support through a competi-
11 tive, merit-based process;

12 (B) involve collaborations among research-
13 ers in academic institutions and industry, and
14 may involve nonprofit research institutions and
15 Federal laboratories, as appropriate;

16 (C) when possible, leverage Federal invest-
17 ments through collaboration with related State
18 initiatives; and

19 (D) include a plan for fostering the trans-
20 fer of research discoveries and the results of
21 technology demonstration activities to industry
22 for commercial development.

23 (2) PROCEDURES.—Determination of the re-
24 quirements for applications under this subsection,
25 review and selection of applications for support, and

1 subsequent funding of projects shall be carried out
2 by a collaboration of no fewer than 2 agencies par-
3 ticipating in the Program. In selecting applications
4 for support, the agencies shall give special consider-
5 ation to projects that include cost sharing from non-
6 Federal sources.

7 (3) INTERDISCIPLINARY RESEARCH CENTERS.—
8 Research and development activities under this sec-
9 tion may be supported through interdisciplinary
10 nanotechnology research centers, as authorized by
11 section 2(b)(4) of the 21st Century Nanotechnology
12 Research and Development Act (15 U.S.C.
13 7501(b)(4)), that are organized to investigate basic
14 research questions and carry out technology dem-
15 onstration activities in areas such as those identified
16 in subsection (a).

17 (c) REPORT.—Reports required under section 2(d) of
18 the 21st Century Nanotechnology Research and Develop-
19 ment Act (15 U.S.C. 7501(d)) shall include a description
20 of research and development areas supported in accord-
21 ance with this section, including the same budget informa-
22 tion as is required for program component areas under
23 paragraphs (1) and (2) of such section 2(d).

1 **SEC. 106. NANOMANUFACTURING RESEARCH.**

2 (a) **RESEARCH AREAS.**—The Nanomanufacturing
3 program component area, or any successor program com-
4 ponent area, shall include research on—

5 (1) development of instrumentation and tools
6 required for the rapid characterization of nanoscale
7 materials and for monitoring of nanoscale manufac-
8 turing processes; and

9 (2) approaches and techniques for scaling the
10 synthesis of new nanoscale materials to achieve in-
11 dustrial-level production rates.

12 (b) **GREEN NANOTECHNOLOGY.**—Interdisciplinary
13 research centers supported under the Program in accord-
14 ance with section 2(b)(4) of the 21st Century Nanotech-
15 nology Research and Development Act (15 U.S.C.
16 7501(b)(4)) that are focused on nanomanufacturing re-
17 search and centers established under the authority of sec-
18 tion 105(b)(3) of this subtitle shall include as part of the
19 activities of such centers—

20 (1) research on methods and approaches to de-
21 velop environmentally benign nanoscale products and
22 nanoscale manufacturing processes, taking into con-
23 sideration relevant findings and results of research
24 supported under the Environmental, Health, and
25 Safety program component area, or any successor
26 program component area;

1 (2) fostering the transfer of the results of such
2 research to industry; and

3 (3) providing for the education of scientists and
4 engineers through interdisciplinary studies in the
5 principles and techniques for the design and develop-
6 ment of environmentally benign nanoscale products
7 and processes.

8 (e) REVIEW OF NANOMANUFACTURING RESEARCH
9 AND RESEARCH FACILITIES.—

10 (1) PUBLIC MEETING.—Not later than 12
11 months after the date of enactment of this Act, the
12 National Nanotechnology Coordination Office shall
13 sponsor a public meeting, including representation
14 from a wide range of industries engaged in
15 nanoscale manufacturing, to—

16 (A) obtain the views of participants at the
17 meeting on—

18 (i) the relevance and value of the re-
19 search being carried out under the Nano-
20 manufacturing program component area of
21 the Program, or any successor program
22 component area; and

23 (ii) whether the capabilities of nano-
24 technology research facilities supported
25 under the Program are adequate—

1 (I) to meet current and near-
2 term requirements for the fabrication
3 and characterization of nanoscale de-
4 vices and systems; and

5 (II) to provide access to and use
6 of instrumentation and equipment at
7 the facilities, by means of networking
8 technology, to individuals who are at
9 locations remote from the facilities;
10 and

11 (B) receive any recommendations on ways
12 to strengthen the research portfolio supported
13 under the Nanomanufacturing program compo-
14 nent area, or any successor program component
15 area, and on improving the capabilities of nano-
16 technology research facilities supported under
17 the Program.

18 Companies participating in industry liaison groups
19 shall be invited to participate in the meeting. The
20 Coordination Office shall prepare a report docu-
21 menting the findings and recommendations resulting
22 from the meeting.

23 (2) ADVISORY PANEL REVIEW.—The Advisory
24 Panel shall review the Nanomanufacturing program
25 component area of the Program, or any successor

1 program component area, and the capabilities of
2 nanotechnology research facilities supported under
3 the Program to assess—

4 (A) whether the funding for the Nano-
5 manufacturing program component area, or any
6 successor program component area, is adequate
7 and receiving appropriate priority within the
8 overall resources available for the Program;

9 (B) the relevance of the research being
10 supported to the identified needs and require-
11 ments of industry;

12 (C) whether the capabilities of nanotech-
13 nology research facilities supported under the
14 Program are adequate—

15 (i) to meet current and near-term re-
16 quirements for the fabrication and charac-
17 terization of nanoscale devices and sys-
18 tems; and

19 (ii) to provide access to and use of in-
20 strumentation and equipment at the facili-
21 ties, by means of networking technology, to
22 individuals who are at locations remote
23 from the facilities; and

24 (D) the level of funding that would be
25 needed to support—

1 (i) the acquisition of instrumentation,
2 equipment, and networking technology suf-
3 ficient to provide the capabilities at nano-
4 technology research facilities described in
5 subparagraph (C); and

6 (ii) the operation and maintenance of
7 such facilities.

8 In carrying out its assessment, the Advisory Panel
9 shall take into consideration the findings and rec-
10 ommendations from the report required under para-
11 graph (1).

12 (3) REPORT.—Not later than 18 months after
13 the date of enactment of this Act, the Advisory
14 Panel shall submit to the Committee on Commerce,
15 Science, and Transportation of the Senate and the
16 Committee on Science and Technology of the House
17 of Representatives a report on its assessment re-
18 quired under paragraph (2), along with any rec-
19 ommendations and a copy of the report prepared in
20 accordance with paragraph (1).

21 **SEC. 107. DEFINITIONS.**

22 In this subtitle, terms that are defined in section 10
23 of the 21st Century Nanotechnology Research and Devel-
24 opment Act (15 U.S.C. 7509) have the meaning given
25 those terms in that section.

1 **Subtitle B—Networking and Infor-**
2 **mation Technology Research**
3 **and Development**

4 **SEC. 111. SHORT TITLE.**

5 This subtitle may be cited as the “Networking and
6 Information Technology Research and Development Act of
7 2010”.

8 **SEC. 112. PROGRAM PLANNING AND COORDINATION.**

9 (a) PERIODIC REVIEWS.—Section 101 of the High-
10 Performance Computing Act of 1991 (15 U.S.C. 5511)
11 is amended by adding at the end the following new sub-
12 section:

13 “(d) PERIODIC REVIEWS.—The agencies identified in
14 subsection (a)(3)(B) shall—

15 “(1) periodically assess the contents and fund-
16 ing levels of the Program Component Areas and re-
17 structure the Program when warranted, taking into
18 consideration any relevant recommendations of the
19 advisory committee established under subsection (b);
20 and

21 “(2) ensure that the Program includes large-
22 scale, long-term, interdisciplinary research and de-
23 velopment activities, including activities described in
24 section 104.”.

1 (b) DEVELOPMENT OF STRATEGIC PLAN.—Section
2 101 of such Act (15 U.S.C. 5511) is amended further by
3 adding after subsection (d), as added by subsection (a)
4 of this section, the following new subsection:

5 “(e) STRATEGIC PLAN.—

6 “(1) IN GENERAL.—The agencies identified in
7 subsection (a)(3)(B), working through the National
8 Science and Technology Council and with the assist-
9 ance of the National Coordination Office established
10 under section 102, shall develop, within 12 months
11 after the date of enactment of the Networking and
12 Information Technology Research and Development
13 Act of 2010, and update every 3 years thereafter, a
14 5-year strategic plan to guide the activities described
15 under subsection (a)(1).

16 “(2) CONTENTS.—The strategic plan shall
17 specify near-term and long-term objectives for the
18 Program, the anticipated time frame for achieving
19 the near-term objectives, the metrics to be used for
20 assessing progress toward the objectives, and how
21 the Program will—

22 “(A) foster the transfer of research and
23 development results into new technologies and
24 applications for the benefit of society, including
25 through cooperation and collaborations with

1 networking and information technology re-
2 search, development, and technology transition
3 initiatives supported by the States;

4 “(B) encourage and support mechanisms
5 for interdisciplinary research and development
6 in networking and information technology, in-
7 cluding through collaborations across agencies,
8 across Program Component Areas, with indus-
9 try, with Federal laboratories (as defined in
10 section 4 of the Stevenson-Wydler Technology
11 Innovation Act of 1980 (15 U.S.C. 3703)), and
12 with international organizations;

13 “(C) address long-term challenges of na-
14 tional importance for which solutions require
15 large-scale, long-term, interdisciplinary research
16 and development;

17 “(D) place emphasis on innovative and
18 high-risk projects having the potential for sub-
19 stantial societal returns on the research invest-
20 ment;

21 “(E) strengthen all levels of networking
22 and information technology education and
23 training programs to ensure an adequate, well-
24 trained workforce; and

1 “(F) attract more women and underrep-
2 resented minorities to pursue postsecondary de-
3 grees in networking and information tech-
4 nology.

5 “(3) NATIONAL RESEARCH INFRASTRUCTURE.—The
6 strategic plan developed in accordance with paragraph (1)
7 shall be accompanied by milestones and roadmaps for es-
8 tablishing and maintaining the national research infra-
9 structure required to support the Program, including the
10 roadmap required by subsection (a)(2)(E).

11 “(4) RECOMMENDATIONS.—The entities involved in
12 developing the strategic plan under paragraph (1) shall
13 take into consideration the recommendations—

14 “(A) of the advisory committee established
15 under subsection (b); and

16 “(B) of the stakeholders whose input was solici-
17 ted by the National Coordination Office, as required
18 under section 102(b)(3).

19 “(5) REPORT TO CONGRESS.—The Director of the
20 National Coordination Office shall transmit the strategic
21 plan required under paragraph (1) to the advisory com-
22 mittee, the Committee on Commerce, Science, and Trans-
23 portation of the Senate, and the Committee on Science
24 and Technology of the House of Representatives.”.

1 (c) ADDITIONAL RESPONSIBILITIES OF DIRECTOR.—
2 Section 101(a)(2) of such Act (15 U.S.C. 5511(a)(2)) is
3 amended—

4 (1) by redesignating subparagraphs (E) and
5 (F) as subparagraphs (F) and (G), respectively; and
6 (2) by inserting after subparagraph (D) the fol-
7 lowing new subparagraph:

8 “(E) encourage and monitor the efforts of
9 the agencies participating in the Program to al-
10 locate the level of resources and management
11 attention necessary to ensure that the strategic
12 plan under subsection (e) is developed and exe-
13 cuted effectively and that the objectives of the
14 Program are met;”.

15 (d) ADVISORY COMMITTEE.—Section 101(b)(1) of
16 such Act (15 U.S.C. 5511(b)(1)) is amended by inserting
17 after “an advisory committee on high-performance com-
18 puting,” the following: “in which the co-chairs shall be
19 members of the President’s Council of Advisors on Science
20 and Technology and with the remainder of the com-
21 mittee”.

22 (e) REPORT.—Section 101(a)(3) of such Act (15
23 U.S.C. 5511(a)(3)) is amended—

24 (1) in subparagraph (C)—

1 (A) by striking “is submitted,” and insert-
2 ing “is submitted, the levels for the previous
3 fiscal year,”; and

4 (B) by striking “each Program Component
5 Area;” and inserting “each Program Compo-
6 nent Area and research area supported in ac-
7 cordance with section 104;”;

8 (2) in subparagraph (D)—

9 (A) by striking “each Program Component
10 Area,” and inserting “each Program Compo-
11 nent Area and research area supported in ac-
12 cordance with section 104;”;

13 (B) by striking “is submitted,” and insert-
14 ing “is submitted, the levels for the previous
15 fiscal year,”; and

16 (C) by striking “and” after the semicolon;

17 (3) by redesignating subparagraph (E) as sub-
18 paragraph (G); and

19 (4) by inserting after subparagraph (D) the fol-
20 lowing new subparagraphs:

21 “(E) include a description of how the ob-
22 jectives for each Program Component Area, and
23 the objectives for activities that involve multiple
24 Program Component Areas, relate to the objec-

1 tives of the Program identified in the strategic
2 plan required under subsection (e);

3 “(F) include—

4 “(i) a description of the funding re-
5 quired by the National Coordination Office
6 to perform the functions specified under
7 section 102(b) for the next fiscal year by
8 category of activity;

9 “(ii) a description of the funding re-
10 quired by such Office to perform the func-
11 tions specified under section 102(b) for the
12 current fiscal year by category of activity;

13 and

14 “(iii) the amount of funding provided
15 for such Office for the current fiscal year
16 by each agency participating in the Pro-
17 gram; and”.

18 (f) DEFINITION.—Section 4 of such Act (15 U.S.C.
19 5503) is amended—

20 (1) by redesignating paragraphs (1) through
21 (7) as paragraphs (2) through (8), respectively;

22 (2) by inserting before paragraph (2), as so re-
23 designated, the following new paragraph:

24 “(1) ‘cyber-physical systems’ means physical or
25 engineered systems whose networking and informa-

1 tion technology functions and physical elements are
2 deeply integrated and are actively connected to the
3 physical world through sensors, actuators, or other
4 means to perform monitoring and control func-
5 tions;”;

6 (3) in paragraph (4), as so redesignated—

7 (A) by striking “high-performance com-
8 puting” and inserting “networking and infor-
9 mation technology”; and

10 (B) by striking “supercomputer” and in-
11 sserting “high-end computing”;

12 (4) in paragraph (6), as so redesignated, by
13 striking “network referred to as” and all that fol-
14 lows through the semicolon and inserting “network,
15 including advanced computer networks of Federal
16 agencies and departments;”; and

17 (5) in paragraph (7), as so redesignated, by
18 striking “National High-Performance Computing
19 Program” and inserting “networking and informa-
20 tion technology research and development program”.

21 **SEC. 113. LARGE-SCALE RESEARCH IN AREAS OF NATIONAL**
22 **IMPORTANCE.**

23 Title I of such Act (15 U.S.C. 5511) is amended by
24 adding at the end the following new section:

1 **“SEC. 104. LARGE-SCALE RESEARCH IN AREAS OF NA-**
2 **TIONAL IMPORTANCE.**

3 “(a) IN GENERAL.—The Program shall encourage
4 agencies identified in section 101(a)(3)(B) to support
5 large-scale, long-term, interdisciplinary research and de-
6 velopment activities in networking and information tech-
7 nology directed toward application areas that have the po-
8 tential for significant contributions to national economic
9 competitiveness and for other significant societal benefits.
10 Such activities, ranging from basic research to the dem-
11 onstration of technical solutions, shall be designed to ad-
12 vance the development of research discoveries. The advi-
13 sory committee established under section 101(b) shall
14 make recommendations to the Program for candidate re-
15 search and development areas for support under this sec-
16 tion.

17 “(b) CHARACTERISTICS.—

18 “(1) IN GENERAL.—Research and development
19 activities under this section shall—

20 “(A) include projects selected on the basis
21 of applications for support through a competi-
22 tive, merit-based process;

23 “(B) involve collaborations among re-
24 searchers in institutions of higher education
25 and industry, and may involve nonprofit re-

1 search institutions and Federal laboratories, as
2 appropriate;

3 “(C) when possible, leverage Federal in-
4 vestments through collaboration with related
5 State initiatives; and

6 “(D) include a plan for fostering the trans-
7 fer of research discoveries and the results of
8 technology demonstration activities, including
9 from institutions of higher education and Fed-
10 eral laboratories, to industry for commercial de-
11 velopment.

12 “(2) COST-SHARING.—In selecting applications
13 for support, the agencies shall give special consider-
14 ation to projects that include cost sharing from non-
15 Federal sources.

16 “(3) AGENCY COLLABORATION.—If 2 or more
17 agencies identified in section 101(a)(3)(B), or other
18 appropriate agencies, are working on large-scale re-
19 search and development activities in the same area
20 of national importance, then such agencies shall
21 strive to collaborate through joint solicitation and se-
22 lection of applications for support and subsequent
23 funding of projects.

24 “(4) INTERDISCIPLINARY RESEARCH CEN-
25 TERS.—Research and development activities under

1 this section may be supported through interdiscipli-
2 nary research centers that are organized to inves-
3 tigate basic research questions and carry out tech-
4 nology demonstration activities in areas described in
5 subsection (a). Research may be carried out through
6 existing interdisciplinary centers, including those au-
7 thorized under section 7024(b)(2) of the America
8 COMPETES Act (Public Law 110–69; 42 U.S.C.
9 1862o–10).”.

10 **SEC. 114. CYBER-PHYSICAL SYSTEMS AND INFORMATION**
11 **MANAGEMENT.**

12 (a) ADDITIONAL PROGRAM CHARACTERISTICS.—Sec-
13 tion 101(a)(1) of such Act (15 U.S.C. 5511(a)(1)) is
14 amended—

15 (1) in subparagraph (H), by striking “and”
16 after the semicolon;

17 (2) in subparagraph (I), by striking the period
18 at the end and inserting a semicolon; and

19 (3) by adding at the end the following new sub-
20 paragraphs:

21 “(J) provide for increased understanding
22 of the scientific principles of cyber-physical sys-
23 tems and improve the methods available for the
24 design, development, and operation of cyber-

1 physical systems that are characterized by high
2 reliability, safety, and security; and

3 “(K) provide for research and development
4 on human-computer interactions, visualization,
5 and information management.”.

6 (b) TASK FORCE.—Title I of such Act (15 U.S.C.
7 5511) is amended further by adding after section 104, as
8 added by section 113 of this Act, the following new sec-
9 tion:

10 **“SEC. 105. UNIVERSITY/INDUSTRY TASK FORCE.**

11 “(a) ESTABLISHMENT.—Not later than 180 days
12 after the date of enactment of the Networking and Infor-
13 mation Technology Research and Development Act of
14 2010, the Director of the National Coordination Office es-
15 tablished under section 102 shall convene a task force to
16 explore mechanisms for carrying out collaborative research
17 and development activities for cyber-physical systems, in-
18 cluding the related technologies required to enable these
19 systems, through a consortium or other appropriate entity
20 with participants from institutions of higher education,
21 Federal laboratories, and industry.

22 “(b) FUNCTIONS.—The task force shall—

23 “(1) develop options for a collaborative model
24 and an organizational structure for such entity
25 under which the joint research and development ac-

1 activities could be planned, managed, and conducted
2 effectively, including mechanisms for the allocation
3 of resources among the participants in such entity
4 for support of such activities;

5 “(2) propose a process for developing a re-
6 search and development agenda for such entity, in-
7 cluding objectives and milestones;

8 “(3) define the roles and responsibilities for the
9 participants from institutions of higher education,
10 Federal laboratories, and industry in such entity;

11 “(4) propose guidelines for assigning intellec-
12 tual property rights and for the transfer of research
13 results to the private sector; and

14 “(5) make recommendations for how such enti-
15 ty could be funded from Federal, State, and non-
16 governmental sources.

17 “(c) COMPOSITION.—In establishing the task force
18 under subsection (a), the Director of the National Coordi-
19 nation Office shall appoint an equal number of individuals
20 from institutions of higher education and from industry
21 with knowledge and expertise in cyber-physical systems,
22 of which 2 may be selected from Federal laboratories.

23 “(d) REPORT.—Not later than 1 year after the date
24 of enactment of the Networking and Information Tech-
25 nology Research and Development Act of 2010, the Direc-

1 tor of the National Coordination Office shall transmit to
2 the Committee on Commerce, Science, and Transportation
3 of the Senate and the Committee on Science and Tech-
4 nology of the House of Representatives a report describing
5 the findings and recommendations of the task force.”.

6 **SEC. 115. NATIONAL COORDINATION OFFICE.**

7 Section 102 of such Act (15 U.S.C. 5512) is amended
8 to read as follows:

9 **“SEC. 102. NATIONAL COORDINATION OFFICE.**

10 “(a) ESTABLISHMENT.—The Director shall establish
11 a National Coordination Office with a Director and full-
12 time staff.

13 “(b) FUNCTIONS.—The National Coordination Office
14 shall—

15 “(1) provide technical and administrative sup-
16 port to—

17 “(A) the agencies participating in planning
18 and implementing the Program, including such
19 support as needed in the development of the
20 strategic plan under section 101(e); and

21 “(B) the advisory committee established
22 under section 101(b);

23 “(2) serve as the primary point of contact on
24 Federal networking and information technology ac-
25 tivities for government organizations, academia, in-

1 industry, professional societies, State computing and
2 networking technology programs, interested citizen
3 groups, and others to exchange technical and pro-
4 grammatic information;

5 “(3) solicit input and recommendations from a
6 wide range of stakeholders during the development
7 of each strategic plan required under section 101(e)
8 through the convening of at least 1 workshop with
9 invitees from academia, industry, Federal labora-
10 tories, and other relevant organizations and institu-
11 tions;

12 “(4) conduct public outreach, including the dis-
13 semination of findings and recommendations of the
14 advisory committee, as appropriate; and

15 “(5) promote access to and early application of
16 the technologies, innovations, and expertise derived
17 from Program activities to agency missions and sys-
18 tems across the Federal Government and to United
19 States industry.

20 “(e) SOURCE OF FUNDING.—

21 “(1) IN GENERAL.—The operation of the Na-
22 tional Coordination Office shall be supported by
23 funds from each agency participating in the Pro-
24 gram.

1 “(2) SPECIFICATIONS.—The portion of the total
2 budget of such Office that is provided by each agen-
3 cy for each fiscal year shall be in the same propor-
4 tion as each such agency’s share of the total budget
5 for the Program for the previous fiscal year, as spec-
6 ified in the report required under section
7 101(a)(3).”.

8 **SEC. 116. IMPROVING NETWORKING AND INFORMATION**
9 **TECHNOLOGY EDUCATION.**

10 Section 201(a) of such Act (15 U.S.C. 5521(a)) is
11 amended—

12 (1) by redesignating paragraphs (2) through
13 (4) as paragraphs (3) through (5), respectively; and
14 (2) by inserting after paragraph (1) the fol-
15 lowing new paragraph:

16 “(2) the National Science Foundation shall use
17 its existing programs, in collaboration with other
18 agencies, as appropriate, to improve the teaching
19 and learning of networking and information tech-
20 nology at all levels of education and to increase par-
21 ticipation in networking and information technology
22 fields, including by women and underrepresented mi-
23 norities;”.

1 **SEC. 117. CONFORMING AND TECHNICAL AMENDMENTS.**

2 (a) SECTION 3.—Section 3 of such Act (15 U.S.C.
3 5502) is amended—

4 (1) in the matter preceding paragraph (1), by
5 striking “high-performance computing” and insert-
6 ing “networking and information technology”;

7 (2) in paragraph (1), in the matter preceding
8 subparagraph (A), by striking “high-performance
9 computing” and inserting “networking and informa-
10 tion technology”;

11 (3) in subparagraphs (A) and (F) of paragraph
12 (1), by striking “high-performance computing” each
13 place it appears and inserting “networking and in-
14 formation technology”; and

15 (4) in paragraph (2)—

16 (A) by striking “high-performance com-
17 puting and” and inserting “networking and in-
18 formation technology and”; and

19 (B) by striking “high-performance com-
20 puting network” and inserting “networking and
21 information technology”.

22 (b) TITLE I.—The heading of title I of such Act (15
23 U.S.C. 5511) is amended by striking “**HIGH-PER-**
24 **FORMANCE COMPUTING**” and inserting “**NET-**
25 **WORKING AND INFORMATION TECH-**
26 **NOLOGY**”.

1 (c) SECTION 101.—Section 101 of such Act (15
2 U.S.C. 5511) is amended—

3 (1) in the section heading, by striking “**HIGH-**
4 **PERFORMANCE COMPUTING**” and inserting
5 “**NETWORKING AND INFORMATION TECH-**
6 **NOLOGY RESEARCH AND DEVELOPMENT**”;

7 (2) in subsection (a)—

8 (A) in the subsection heading, by striking
9 “NATIONAL HIGH-PERFORMANCE COMPUTING”
10 and inserting “NETWORKING AND INFORMA-
11 TION TECHNOLOGY RESEARCH AND DEVELOP-
12 MENT”;

13 (B) in paragraph (1) of such subsection—

14 (i) in the matter preceding subpara-
15 graph (A), by striking “National High-Per-
16 formance Computing Program” and insert-
17 ing “networking and information tech-
18 nology research and development pro-
19 gram”;

20 (ii) in subparagraph (A), by striking
21 “high-performance computing, including
22 networking” and inserting “networking
23 and information technology”; and

24 (iii) in subparagraphs (B), (C), and
25 (G), by striking “high-performance” each

1 place it appears and inserting “high-end”;
2 and
3 (C) in paragraph (2) of such subsection—
4 (i) in subparagraphs (A) and (C)—
5 (I) by striking “high-performance
6 computing” each place it appears and
7 inserting “networking and information
8 technology”; and
9 (II) by striking “development,
10 networking,” each place it appears
11 and inserting “development,”; and
12 (ii) in subparagraphs (F) and (G), as
13 redesignated by section 112(c)(1) of this
14 Act, by striking “high-performance” each
15 place it appears and inserting “high-end”;
16 (3) in subsection (b)(1), in the matter pre-
17 ceding subparagraph (A), by striking “high-perform-
18 ance computing” both places it appears and insert-
19 ing “networking and information technology”; and
20 (4) in subsection (c)(1)(A), by striking “high-
21 performance computing” and inserting “networking
22 and information technology”.
23 (d) SECTION 201.—Section 201(a)(1) of such Act
24 (15 U.S.C. 5521(a)(1)) is amended by striking “high-per-
25 formance computing” and all that follows through “net-

1 working;” and inserting “networking and information re-
2 search and development;”.

3 (e) SECTION 202.—Section 202(a) of such Act (15
4 U.S.C. 5522(a)) is amended by striking “high-perform-
5 ance computing” and inserting “networking and informa-
6 tion technology”.

7 (f) SECTION 203.—Section 203(a)(1) of such Act (15
8 U.S.C. 5523(a)(1)) is amended by striking “high-perform-
9 ance computing and networking” and inserting “net-
10 working and information technology”.

11 (g) SECTION 204.—Section 204(a)(1) of such Act
12 (15 U.S.C. 5524(a)(1)) is amended—

13 (1) in subparagraph (A), by striking “high-per-
14 formance computing systems and networks” and in-
15 serting “networking and information technology sys-
16 tems and capabilities”; and

17 (2) in subparagraph (C), by striking “high-per-
18 formance computing” and inserting “networking and
19 information technology”.

20 (h) SECTION 205.—Section 205(a) of such Act (15
21 U.S.C. 5525(a)) is amended by striking “computational”
22 and inserting “networking and information technology”.

23 (i) SECTION 206.—Section 206(a) of such Act (15
24 U.S.C. 5526(a)) is amended by striking “computational

1 research” and inserting “networking and information
2 technology research”.

3 (j) SECTION 208.—Section 208 of such Act (15
4 U.S.C. 5528) is amended—

5 (1) in the section heading, by striking “**HIGH-**
6 **PERFORMANCE COMPUTING**” and inserting
7 “**NETWORKING AND INFORMATION TECH-**
8 **NOLOGY**”; and

9 (2) in subsection (a)—

10 (A) in paragraph (1), by striking “High-
11 performance computing and associated” and in-
12 serting “Networking and information”;

13 (B) in paragraph (2), by striking “high-
14 performance computing” and inserting “net-
15 working and information technologies”;

16 (C) in paragraph (4), by striking “high-
17 performance computers and associated” and in-
18 serting “networking and information”; and

19 (D) in paragraph (5), by striking “high-
20 performance computing and associated” and in-
21 serting “networking and information”.

22 **Subtitle C—Other OSTP Provisions**

23 **SEC. 121. FEDERAL SCIENTIFIC COLLECTIONS.**

24 (a) MANAGEMENT OF SCIENTIFIC COLLECTIONS.—

25 The Office of Science and Technology Policy, in consulta-

1 tion with relevant Federal agencies, shall ensure the devel-
2 opment of formal policies for the management and use of
3 Federal scientific collections to improve the quality, orga-
4 nization, access, including online access, and long-term
5 preservation of such collections for the benefit of the sci-
6 entific enterprise.

7 (b) DEFINITION.—For the purposes of this section,
8 the term “scientific collection” means a set of physical
9 specimens, living or inanimate, created for the purpose of
10 supporting science and serving as a long-term research
11 asset, rather than for their market value as collectibles
12 or their historical, artistic, or cultural significance.

13 (e) CLEARINGHOUSE.—The Office of Science and
14 Technology Policy, in consultation with relevant Federal
15 agencies, shall ensure the development of an online clear-
16 ighthouse for information on the contents of and access
17 to Federal scientific collections.

18 (d) DISPOSAL OF COLLECTIONS.—The policies devel-
19 oped under subsection (a) shall—

20 (1) require that, before disposing of a scientific
21 collection, a Federal agency shall—

22 (A) conduct a review of the research value
23 of the collection; and

1 (B) consult with researchers who have
2 used the collection, and other potentially inter-
3 ested parties, concerning—

4 (i) the collection's value for research
5 purposes; and

6 (ii) possible additional educational
7 uses for the collection; and

8 (2) include procedures for Federal agencies to
9 transfer scientific collections they no longer need to
10 researchers at institutions or other entities qualified
11 to manage the collections.

12 (e) COST PROJECTIONS.—The Office of Science and
13 Technology Policy, in consultation with relevant Federal
14 agencies, shall develop a common set of methodologies to
15 be used by Federal agencies for the assessment and pro-
16 jection of costs associated with the management and pres-
17 ervation of their scientific collections.

18 **SEC. 122. COORDINATION OF MANUFACTURING RESEARCH**
19 **AND DEVELOPMENT.**

20 (a) INTERAGENCY COMMITTEE.—The Director of the
21 Office of Science and Technology Policy shall establish or
22 designate an interagency committee under the National
23 Science and Technology Council with the responsibility for
24 planning and coordinating Federal programs and activities
25 in manufacturing research and development.

1 (b) RESPONSIBILITIES OF COMMITTEE.—The inter-
2 agency committee established or designated under sub-
3 section (a) shall—

4 (1) coordinate the manufacturing research and
5 development programs and activities of the Federal
6 agencies;

7 (2) establish goals and priorities for manufac-
8 turing research and development that will strengthen
9 United States manufacturing; and

10 (3) develop and update every 5 years thereafter
11 a strategic plan to guide Federal programs and ac-
12 tivities in support of manufacturing research and de-
13 velopment, which shall—

14 (A) specify and prioritize near-term and
15 long-term research and development objectives,
16 the anticipated time frame for achieving the ob-
17 jectives, and the metrics for use in assessing
18 progress toward the objectives;

19 (B) specify the role of each Federal agency
20 in carrying out or sponsoring research and de-
21 velopment to meet the objectives of the stra-
22 tegic plan; and

23 (C) describe how the Federal agencies sup-
24 porting manufacturing research and develop-
25 ment will foster the transfer of research and de-

1 development results into new manufacturing tech-
2 nologies, processes, and products for the benefit
3 of society and the national interest.

4 (c) RECOMMENDATIONS.—In the development of the
5 strategic plan required under subsection (b)(3), the Direc-
6 tor of the Office of Science and Technology Policy, work-
7 ing through the interagency committee, shall take into
8 consideration the recommendations of a wide range of
9 stakeholders, including representatives from diverse man-
10 ufacturing companies, academia, and other relevant orga-
11 nizations and institutions.

12 (d) REPORT TO CONGRESS.—Not later than 1 year
13 after the date of enactment of this Act, the Director of
14 the Office of Science and Technology Policy shall transmit
15 the strategic plan developed under subsection (b)(3) to the
16 Committee on Commerce, Science, and Transportation of
17 the Senate, and the Committee on Science and Technology
18 of the House of Representatives, and shall transmit subse-
19 quent updates to those committees when completed.

20 **SEC. 123. INTERAGENCY PUBLIC ACCESS COMMITTEE.**

21 (a) DEFINITION.—For the purposes of this section,
22 the term “Federal science agency” means any Federal
23 agency with an annual extramural research expenditure
24 of over \$100,000,000.

1 (b) ESTABLISHMENT.—The Director of the Office of
2 Science and Technology Policy shall establish a working
3 group under the National Science and Technology Council
4 with the responsibility to coordinate Federal science agen-
5 cy policies related to the dissemination and long-term
6 stewardship of the results of unclassified research, includ-
7 ing digital data and peer-reviewed scholarly publications,
8 supported wholly or in part by funding from the Federal
9 science agencies.

10 (c) REQUIREMENTS.—The Director, acting through
11 the working group established under subsection (b), shall
12 ensure that, in developing any policies related to public
13 access to the results of federally funded research, Federal
14 science agencies collaborate to develop policies that—

15 (1) develop or designate uniform standards for
16 research data, the structure of full text and
17 metadata, navigation tools, and other applications to
18 achieve interoperability across Federal science agen-
19 cies, across science and engineering disciplines, and
20 between research data and scholarly publications,
21 taking into account existing consensus standards, in-
22 cluding international standards;

23 (2) foster innovation in the research and edu-
24 cational use of scholarly publications;

1 (3) address the need for long-term preservation
2 and stewardship of all forms of digital research data,
3 including by supporting research on tools and sys-
4 tems required to ensure preservation and steward-
5 ship;

6 (4) take into account comparable policies in
7 other countries; and

8 (5) take into account research data that ad-
9 vance collective understanding and knowledge in
10 some science and engineering disciplines but are not
11 necessarily published in scholarly journals.

12 (d) STAKEHOLDER INPUT.—In developing any poli-
13 cies related to public access to the results of federally
14 funded research, the Director, acting through the working
15 group established under subsection (b), shall solicit input
16 and recommendations from and collaborate with non-Fed-
17 eral stakeholders, including universities, nonprofit and for-
18 profit publishers, libraries, and other organizations and in-
19 stitutions with a stake in long term preservation and ac-
20 cess to the results of federally funded research, including
21 relevant international organizations.

22 (e) EXCLUSIONS.—Federal policies developed under
23 this section shall not apply to—

24 (1) research progress reports presented at pro-
25 fessional meetings or conferences;

1 (2) laboratory notes, preliminary data analyses,
2 notes of the author, phone logs, or other information
3 used to produce scholarly publications except for the
4 data reported in the publications;

5 (3) classified research, or research resulting in
6 works that generate revenue or royalties for authors
7 (such as books) or patentable discoveries, to the ex-
8 tent necessary to protect a copyright or patent; or

9 (4) original research papers that are rejected by
10 scholarly journals.

11 (f) PATENT OR COPYRIGHT LAW.—Nothing in this
12 section shall be construed to affect any right under the
13 provisions of title 17 or 35, United States Code.

14 (g) REPORT TO CONGRESS.—Not later than 1 year
15 after the date of enactment of this Act, the Director of
16 the Office of Science and Technology Policy shall transmit
17 a report to Congress describing the status of any Federal
18 science agency policies related to public access to the re-
19 sults of federally funded research, including a description
20 of the extent to which the policies meet the requirements
21 in subsection (c), and a description of how the Federal
22 science agencies will continue to work toward achieving
23 any of the requirements in subsection (c) that are not yet
24 achieved at the time of the report.

1 **TITLE II—NATIONAL SCIENCE**
2 **FOUNDATION**

3 **SEC. 201. SHORT TITLE.**

4 This title may be cited as the “National Science
5 Foundation Authorization Act of 2010”.

6 **Subtitle A—General Provisions**

7 **SEC. 211. DEFINITIONS.**

8 In this title:

9 (1) **DIRECTOR.**—The term “Director” means
10 the Director of the National Science Foundation es-
11 tablished under section 2 of the National Science
12 Foundation Act of 1950 (42 U.S.C. 1861).

13 (2) **FOUNDATION.**—The term “Foundation”
14 means the National Science Foundation established
15 under section 2 of the National Science Foundation
16 Act of 1950 (42 U.S.C. 1861).

17 (3) **INSTITUTION OF HIGHER EDUCATION.**—The
18 term “institution of higher education” has the
19 meaning given such term in section 101(a) of the
20 Higher Education Act of 1965 (20 U.S.C. 1001(a)).

21 (4) **STATE.**—The term “State” means one of
22 the several States, the District of Columbia, the
23 Commonwealth of Puerto Rico, the Virgin Islands,
24 Guam, American Samoa, the Commonwealth of the

1 Northern Mariana Islands, or any other territory or
2 possession of the United States.

3 (5) STEM.—The term “STEM” means science,
4 technology, engineering, and mathematics.

5 (6) UNITED STATES.—The term “United
6 States” means the several States, the District of Co-
7 lumbia, the Commonwealth of Puerto Rico, the Vir-
8 gin Islands, Guam, American Samoa, the Common-
9 wealth of the Northern Mariana Islands, and any
10 other territory or possession of the United States.

11 **SEC. 212. AUTHORIZATION OF APPROPRIATIONS.**

12 (a) FISCAL YEAR 2011.—

13 (1) IN GENERAL.—There are authorized to be
14 appropriated to the Foundation \$8,219,670,000 for
15 fiscal year 2011.

16 (2) SPECIFIC ALLOCATIONS.—Of the amount
17 authorized under paragraph (1)—

18 (A) \$6,600,000,000 shall be made avail-
19 able for research and related activities;

20 (B) \$1,104,000,000 shall be made avail-
21 able for education and human resources;

22 (C) \$166,000,000 shall be made available
23 for major research equipment and facilities con-
24 struction;

1 (D) \$330,000,000 shall be made available
2 for agency operations and award management;

3 (E) \$4,840,000 shall be made available for
4 the Office of the National Science Board; and

5 (F) \$14,830,000 shall be made available
6 for the Office of Inspector General.

7 (b) FISCAL YEAR 2012.—

8 (1) IN GENERAL.—There are authorized to be
9 appropriated to the Foundation \$8,932,080,000 for
10 fiscal year 2012.

11 (2) SPECIFIC ALLOCATIONS.—Of the amount
12 authorized under paragraph (1)—

13 (A) \$7,128,000,000 shall be made avail-
14 able for research and related activities;

15 (B) \$1,192,320,000 shall be made avail-
16 able for education and human resources;

17 (C) \$235,000,000 shall be made available
18 for major research equipment and facilities con-
19 struction;

20 (D) \$356,400,000 shall be made available
21 for agency operations and award management;

22 (E) \$5,010,000 shall be made available for
23 the Office of the National Science Board; and

24 (F) \$15,350,000 shall be made available
25 for the Office of Inspector General.

1 (e) FISCAL YEAR 2013.—

2 (1) IN GENERAL.—There are authorized to be
3 appropriated to the Foundation \$9,555,160,000 for
4 fiscal year 2013.

5 (2) SPECIFIC ALLOCATIONS.—Of the amount
6 authorized under paragraph (1)—

7 (A) \$7,626,960,000 shall be made avail-
8 able for research and related activities;

9 (B) \$1,275,780,000 shall be made avail-
10 able for education and human resources;

11 (C) \$250,000,000 shall be made available
12 for major research equipment and facilities con-
13 struction;

14 (D) \$381,350,000 shall be made available
15 for agency operations and award management;

16 (E) \$5,180,000 shall be made available for
17 the Office of the National Science Board; and

18 (F) \$15,890,000 shall be made available
19 for the Office of Inspector General.

20 (d) FISCAL YEAR 2014.—

21 (1) IN GENERAL.—There are authorized to be
22 appropriated to the Foundation \$10,112,940,000 for
23 fiscal year 2014.

24 (2) SPECIFIC ALLOCATIONS.—Of the amount
25 authorized under paragraph (1)—

1 (A) \$8,084,580,000 shall be made avail-
2 able for research and related activities;

3 (B) \$1,352,330,000 shall be made avail-
4 able for education and human resources;

5 (C) \$250,000,000 shall be made available
6 for major research equipment and facilities con-
7 struction;

8 (D) \$404,230,000 shall be made available
9 for agency operations and award management;

10 (E) \$5,370,000 shall be made available for
11 the Office of the National Science Board; and

12 (F) \$16,440,000 shall be made available
13 for the Office of Inspector General.

14 (e) FISCAL YEAR 2015.—

15 (1) IN GENERAL.—There are authorized to be
16 appropriated to the Foundation \$10,704,180,000 for
17 fiscal year 2015.

18 (2) SPECIFIC ALLOCATIONS.—Of the amount
19 authorized under paragraph (1)—

20 (A) \$8,569,650,000 shall be made avail-
21 able for research and related activities;

22 (B) \$1,433,470,000 shall be made avail-
23 able for education and human resources;

1 (C) \$250,000,000 shall be made available
2 for major research equipment and facilities con-
3 struction;

4 (D) \$428,480,000 shall be made available
5 for agency operations and award management;

6 (E) \$5,550,000 shall be made available for
7 the Office of the National Science Board; and

8 (F) \$17,020,000 shall be made available
9 for the Office of Inspector General.

10 **SEC. 213. NATIONAL SCIENCE BOARD ADMINISTRATIVE**
11 **AMENDMENTS.**

12 (a) STAFFING AT THE NATIONAL SCIENCE BOARD.—
13 Section 4(g) of the National Science Foundation Act of
14 1950 (42 U.S.C. 1863(g)) is amended by striking “not
15 more than 5”.

16 (b) SCIENCE AND ENGINEERING INDICATORS DUE
17 DATE.—Section 4(j)(1) of the National Science Founda-
18 tion Act of 1950 (42 U.S.C. 1863(j)(1)) is amended by
19 striking “January 15” and inserting “May 31”.

20 (c) NATIONAL SCIENCE BOARD REPORTS.—Section
21 4(j)(2) of the National Science Foundation Act of 1950
22 (42 U.S.C. 1863(j)(2)) is amended by inserting “within
23 the authority of the Foundation (or otherwise as requested
24 by the appropriate Congressional committees of jurisdic-
25 tion or the President)” after “individual policy matters”.

1 (d) BOARD ADHERENCE TO SUNSHINE ACT.—Sec-
2 tion 15(a) of the National Science Foundation Authoriza-
3 tion Act of 2002 (42 U.S.C. 1862n-5(a)) is amended—

4 (1) by striking paragraph (3) and redesignating
5 paragraphs (4) and (5) as paragraphs (3) and (4),
6 respectively;

7 (2) in paragraph (3), as so redesignated by
8 paragraph (1) of this subsection—

9 (A) by striking “February 15” and insert-
10 ing “April 15”; and

11 (B) by striking “the audit required under
12 paragraph (3) along with” and inserting “any”;
13 and

14 (3) in paragraph (4), as so redesignated by
15 paragraph (1) of this subsection, by striking “To fa-
16 cilitate the audit required under paragraph (3) of
17 this subsection, the” and inserting “The”.

18 **SEC. 214. BROADER IMPACTS REVIEW CRITERION.**

19 (a) GOALS.—The Foundation shall apply a Broader
20 Impacts Review Criterion to achieve the following goals:

21 (1) Increased economic competitiveness of the
22 United States.

23 (2) Development of a globally competitive
24 STEM workforce.

1 (3) Increased participation of women and
2 underrepresented minorities in STEM.

3 (4) Increased partnerships between academia
4 and industry.

5 (5) Improved pre-K–12 STEM education and
6 teacher development.

7 (6) Improved undergraduate STEM education.

8 (7) Increased public scientific literacy.

9 (8) Increased national security.

10 (b) *POLICY*.—Not later than 6 months after the date
11 of enactment of this Act, the Director shall develop and
12 implement a policy for the Broader Impacts Review Cri-
13 terion that—

14 (1) provides for educating professional staff at
15 the Foundation, merit review panels, and applicants
16 for Foundation research grants on the policy devel-
17 oped under this subsection;

18 (2) clarifies that the activities of grant recipi-
19 ents undertaken to satisfy the Broader Impacts Re-
20 view Criterion shall—

21 (A) to the extent practicable employ proven
22 strategies and models and draw on existing pro-
23 grams and activities; and

24 (B) when novel approaches are justified,
25 build on the most current research results;

1 (3) allows for some portion of funds allocated to
2 broader impacts under a research grant to be used
3 for assessment and evaluation of the broader im-
4 pacts activity;

5 (4) encourages institutions of higher education
6 and other nonprofit education or research organiza-
7 tions to develop and provide, either as individual in-
8 stitutions or in partnerships thereof, appropriate
9 training and programs to assist Foundation-funded
10 principal investigators at their institutions in achiev-
11 ing the goals of the Broader Impacts Review Cri-
12 terion as described in subsection (a); and

13 (5) requires principal investigators applying for
14 Foundation research grants to provide evidence of
15 institutional support for the portion of the investiga-
16 tor's proposal designed to satisfy the Broader Im-
17 pacts Review Criterion, including evidence of rel-
18 evant training, programs, and other institutional re-
19 sources available to the investigator from either their
20 home institution or organization or another institu-
21 tion or organization with relevant expertise.

22 **SEC. 215. NATIONAL CENTER FOR SCIENCE AND ENGINEER-**
23 **ING STATISTICS.**

24 (a) **ESTABLISHMENT.**—There is established within
25 the Foundation a National Center for Science and Engi-

1 neering Statistics (in this section referred to as the “Cen-
2 ter”), that shall serve as a central Federal clearinghouse
3 for the collection, interpretation, analysis, and dissemina-
4 tion of objective data on science, engineering, technology,
5 and research and development.

6 (b) DUTIES.—In carrying out subsection (a) of this
7 section, the Director, acting through the Center shall—

8 (1) collect, acquire, analyze, report, and dis-
9 seminate statistical data related to the science and
10 engineering enterprise in the United States and
11 other nations that is relevant and useful to practi-
12 tioners, researchers, policymakers, and the public,
13 including statistical data on—

14 (A) research and development trends;

15 (B) the science and engineering workforce;

16 (C) United States competitiveness in
17 science, engineering, technology, and research
18 and development; and

19 (D) the condition and progress of United
20 States STEM education;

21 (2) support research using the data it collects,
22 and on methodologies in areas related to the work
23 of the Center; and

1 (3) support the education and training of re-
2 searchers in the use of large-scale, nationally rep-
3 resentative data sets.

4 (c) STATISTICAL REPORTS.—The Director or the Na-
5 tional Science Board, acting through the Center, shall
6 issue regular, and as necessary, special statistical reports
7 on topics related to the national and international science
8 and engineering enterprise such as the biennial report re-
9 quired by section 4 (j)(1) of the National Science Founda-
10 tion Act of 1950 (42 U.S.C. 1863(j)(1)) on indicators of
11 the state of science and engineering in the United States.

12 **Subtitle B—Research and** 13 **Innovation**

14 **SEC. 221. SUPPORT FOR POTENTIALLY TRANSFORMATIVE** 15 **RESEARCH.**

16 (a) POLICY.—The Director shall establish a policy
17 that requires the Foundation to use at least 5 percent of
18 its research budget to fund high-risk, high-reward basic
19 research proposals. Support for facilities and infrastruc-
20 ture, including preconstruction design and operations and
21 maintenance of major research facilities, shall not be
22 counted as part of the research budget for the purposes
23 of this section.

24 (b) IMPLEMENTATION.—In implementing such policy,
25 the Foundation may—

1 (1) develop solicitations specifically for high-
2 risk, high-reward basic research;

3 (2) establish review panels for the primary pur-
4 pose of selecting high-risk, high-reward proposals or
5 modify instructions to standard review panels to re-
6 quire identification of high-risk, high-reward pro-
7 posals; and

8 (3) support workshops and participate in con-
9 ferences with the primary purpose of identifying new
10 opportunities for high-risk, high-reward basic re-
11 search, especially at interdisciplinary interfaces.

12 (c) DEFINITION.—For purposes of this section, the
13 term “high-risk, high-reward basic research” means re-
14 search driven by ideas that have the potential to radically
15 change our understanding of an important existing sci-
16 entific or engineering concept, or leading to the creation
17 of a new paradigm or field of science or engineering, and
18 that is characterized by its challenge to current under-
19 standing or its pathway to new frontiers.

20 **SEC. 222. FACILITATING INTERDISCIPLINARY COLLABORA-**
21 **TIONS FOR NATIONAL NEEDS.**

22 (a) IN GENERAL.—The Director shall award competi-
23 tive, merit-based awards in amounts not to exceed
24 \$5,000,000 over a period of up to 5 years to interdiscipli-
25 nary research collaborations that are likely to assist in ad-

1 dressing critical challenges to national security, competi-
2 tiveness, and societal well-being and that—

3 (1) involve at least 2 co-equal principal inves-
4 tigators at the same or different institutions;

5 (2) draw upon well-integrated, diverse teams of
6 investigators, including students or postdoctoral re-
7 searchers, from one or more disciplines; and

8 (3) foster creativity and pursue high-risk, high-
9 reward research.

10 (b) PRIORITY.—In selecting grant recipients under
11 this section, the Director shall give priority to applicants
12 that propose to utilize advances in cyberinfrastructure and
13 simulation-based science and engineering.

14 **SEC. 223. NATIONAL SCIENCE FOUNDATION MANUFAC-**
15 **TURING RESEARCH.**

16 The Director shall carry out a program to award
17 merit-reviewed, competitive grants to institutions of higher
18 education to support fundamental research leading to
19 transformative advances in manufacturing technologies,
20 processes, and enterprises that will support United States
21 manufacturing through improved performance, produc-
22 tivity, sustainability, and competitiveness. Research areas
23 may include—

24 (1) nanomanufacturing;

1 (2) manufacturing and construction machines
2 and equipment, including robotics, automation, and
3 other intelligent systems;

4 (3) manufacturing enterprise systems;

5 (4) advanced sensing and control techniques;

6 (5) materials processing; and

7 (6) information technologies for manufacturing,
8 including predictive and real-time models and sim-
9 ulations, and virtual manufacturing.

10 **SEC. 224. STRENGTHENING INSTITUTIONAL RESEARCH**
11 **PARTNERSHIPS.**

12 (a) IN GENERAL.—For any Foundation research
13 grant, in an amount greater than \$2,000,000, to be car-
14 ried out through a partnership that includes one or more
15 minority-serving institutions or predominantly under-
16 graduate institutions and one or more institutions de-
17 scribed in subsection (b), the Director shall award funds
18 directly, according to the budget justification described in
19 the grant proposal, to at least two of the institutions of
20 higher education in the partnership, including at least one
21 minority-serving institution or one predominantly under-
22 graduate institution, to ensure a strong and equitable
23 partnership.

24 (b) INSTITUTIONS.—The institutions referred to in
25 subsection (a) are institutions of higher education that are

1 among the 100 institutions receiving, over the 3-year pe-
2 riod immediately preceding the awarding of grants, the
3 highest amount of research funding from the Foundation.

4 **SEC. 225. NATIONAL SCIENCE BOARD REPORT ON MID-**
5 **SCALE INSTRUMENTATION.**

6 (a) MID-SCALE RESEARCH INSTRUMENTATION
7 NEEDS.—The National Science Board shall evaluate the
8 needs, across all disciplines supported by the Foundation,
9 for mid-scale research instrumentation that falls between
10 the instruments funded by the Major Research Instrumen-
11 tation program and the very large projects funded by the
12 Major Research Equipment and Facilities Construction
13 program.

14 (b) REPORT ON MID-SCALE RESEARCH INSTRUMEN-
15 TATION PROGRAM.—Not later than 1 year after the date
16 of enactment of this Act, the National Science Board shall
17 submit to Congress a report on mid-scale research instru-
18 mentation at the Foundation. At a minimum, this report
19 shall include—

20 (1) the findings from the Board's evaluation of
21 instrumentation needs required under subsection (a),
22 including a description of differences across dis-
23 ciplines and Foundation research directorates;

24 (2) a recommendation or recommendations re-
25 garding how the Foundation should set priorities for

1 mid-scale instrumentation across disciplines and
2 Foundation research directorates;

3 (3) a recommendation or recommendations re-
4 garding the appropriateness of expanding existing
5 programs, including the Major Research Instrumen-
6 tation program or the Major Research Equipment
7 and Facilities Construction program, to support
8 more instrumentation at the mid-scale;

9 (4) a recommendation or recommendations re-
10 garding the need for and appropriateness of a new,
11 Foundation-wide program or initiative in support of
12 mid-scale instrumentation, including any rec-
13 ommendations regarding the administration of and
14 budget for such a program or initiative and the ap-
15 propriate scope of instruments to be funded under
16 such a program or initiative; and

17 (5) any recommendation or recommendations
18 regarding other options for supporting mid-scale re-
19 search instrumentation at the Foundation.

20 **SEC. 226. SENSE OF CONGRESS ON OVERALL SUPPORT FOR**
21 **RESEARCH INFRASTRUCTURE AT THE FOUN-**
22 **DATION.**

23 It is the sense of Congress that the Foundation
24 should strive to keep the percentage of the Foundation
25 budget devoted to research infrastructure in the range of

1 24 to 27 percent, as recommended in the 2003 National
2 Science Board report entitled “Science and Engineering
3 Infrastructure for the 21st Century”.

4 **SEC. 227. PARTNERSHIPS FOR INNOVATION.**

5 (a) IN GENERAL.—The Director shall carry out a
6 program to award merit-reviewed, competitive grants to
7 institutions of higher education to establish and to expand
8 partnerships that promote innovation and increase the
9 economic and social impact of research by developing tools
10 and resources to connect new scientific discoveries to prac-
11 tical uses.

12 (b) PARTNERSHIPS.—

13 (1) IN GENERAL.—To be eligible for funding
14 under this section, an institution of higher education
15 must propose establishment of a partnership that—

16 (A) includes at least one private sector en-
17 tity; and

18 (B) may include other institutions of high-
19 er education, public sector institutions, and pri-
20 vate sector entities.

21 (2) PRIORITY.—In selecting grant recipients
22 under this section, the Director shall give priority to
23 partnerships that include one or more institutions of
24 higher education that are among the 100 institu-
25 tions receiving, over the 3-year period immediately

1 preceding the awarding of grants, the highest
2 amount of research funding from the Foundation
3 and at least one of the following:

4 (A) A minority serving institution.

5 (B) A primarily undergraduate institution.

6 (C) A 2-year college.

7 (c) PROGRAM.—Proposals funded under this section
8 shall seek to—

9 (1) increase the economic or social impact of
10 the most promising research at the institution or in-
11 stitutions of higher education that are members of
12 the partnership through knowledge transfer or com-
13 mercialization;

14 (2) increase the engagement of faculty and stu-
15 dents across multiple disciplines and departments,
16 including faculty and students in schools of business
17 and other appropriate non-STEM fields and dis-
18 ciplines in knowledge transfer activities;

19 (3) enhance education and mentoring of stu-
20 dents and faculty in innovation and entrepreneur-
21 ship through networks, courses, and development of
22 best practices and curricula;

23 (4) strengthen the culture of the institution or
24 institutions of higher education to undertake and

1 participate in activities related to innovation and
2 leading to economic or social impact;

3 (5) broaden the participation of all types of in-
4 stitutions of higher education in activities to meet
5 STEM workforce needs and promote innovation and
6 knowledge transfer; and

7 (6) build lasting partnerships with local and re-
8 gional businesses, local and State governments, and
9 other relevant entities.

10 (d) ADDITIONAL CRITERIA.—In selecting grant re-
11 cipients under this section, the Director shall also consider
12 the extent to which the applicants are able to demonstrate
13 evidence of institutional support for, and commitment
14 to—

15 (1) achieving the goals of the program as de-
16 scribed in subsection (c);

17 (2) expansion to a university-wide program if
18 the initial proposal is not for a university-wide pro-
19 gram; and

20 (3) sustaining any new innovation tools and re-
21 sources generated from funding under this program.

22 (e) LIMITATION.—No funds provided under this sec-
23 tion may be used to construct or renovate a building or
24 structure.

1 **SEC. 228. PRIZE AWARDS.**

2 (a) IN GENERAL.—The Director shall carry out a
3 pilot program to award innovation inducement cash prizes
4 in any area of research supported by the Foundation. The
5 Director may carry out a program of cash prizes only in
6 conformity with this section.

7 (b) TOPICS.—In identifying topics for prize competi-
8 tions under this section, the Director shall—

9 (1) consult widely both within and outside the
10 Federal Government;

11 (2) give priority to high-risk, high-reward re-
12 search challenges and to problems whose solution
13 could improve the economic competitiveness of the
14 United States; and

15 (3) give consideration to the extent to which the
16 topics have the potential to raise public awareness
17 about federally sponsored research.

18 (c) TYPES OF CONTESTS.—The Director shall con-
19 sider all categories of innovation inducement prizes, in-
20 cluding—

21 (1) contests in which the award is to the first
22 team or individual who accomplishes a stated objec-
23 tive; and

24 (2) contests in which the winner is the team or
25 individual who comes closest to achieving an objec-
26 tive within a specified time.

1 (d) ADVERTISING AND ANNOUNCEMENT.—

2 (1) ADVERTISING AND SOLICITATION OF COM-
3 PETITORS.—The Director shall widely advertise
4 prize competitions to encourage broad participation
5 including by individuals, institutions of higher edu-
6 cation, nonprofit organizations, and businesses.

7 (2) ANNOUNCEMENT THROUGH FEDERAL REG-
8 ISTER NOTICE.—The Director shall announce each
9 prize competition by publishing a notice in the Fed-
10 eral Register. This notice shall include the subject of
11 the competition, the duration of the competition, the
12 eligibility requirements for participation in the com-
13 petition, the process for participants to register for
14 the competition, the amount of the prize, and the
15 criteria for awarding the prize, including the method
16 by which the prize winner or winners will be se-
17 lected.

18 (3) TIME TO ANNOUNCEMENT.—The Director
19 shall announce a prize competition within 18 months
20 after receipt of appropriated funds.

21 (e) FUNDING.—

22 (1) FUNDING SOURCES.—Prizes under this sec-
23 tion shall consist of Federal appropriated funds and
24 any funds raised pursuant to donations authorized
25 under section 11(f) of the National Science Founda-

1 tion Act of 1950 (42 U.S.C. 1870(f)) for specific
2 prize competitions.

3 (2) ANNOUNCEMENT OF PRIZES.—The Director
4 may not issue a notice as required by subsection
5 (d)(2) until all of the funds needed to pay out the
6 announced amount of the prize have been appro-
7 priated or committed in writing by another entity
8 pursuant to paragraph (1).

9 (f) ELIGIBILITY.—To be eligible to win a prize under
10 this section, an individual or entity—

11 (1) shall have complied with all of the require-
12 ments under this section;

13 (2) in the case of a private entity, shall be in-
14 corporated in and maintain a primary place of busi-
15 ness in the United States, and in the case of an in-
16 dividual, whether participating singly or in a group,
17 shall be a United States citizen or national, or an
18 alien lawfully admitted to the United States for per-
19 manent residence; and

20 (3) shall not be a Federal entity, a Federal em-
21 ployee acting within the scope of his or her employ-
22 ment, or a person employed at a Federal laboratory
23 acting within the scope of his or her employment.

24 (g) AWARDS.—

1 (1) NUMBER OF COMPETITIONS.—The Director
2 may announce up to 5 prize competitions through
3 the end of fiscal year 2013.

4 (2) SIZE OF AWARD.—The Director may deter-
5 mine the amount of each prize award based on the
6 prize topic, but no award shall be less than
7 \$1,000,000 or greater than \$3,000,000.

8 (3) SELECTING WINNERS.—The Director may
9 convene an expert panel to select a winner of a prize
10 competition. If the panel is unable to select a win-
11 ner, the Director shall determine the winner of the
12 prize.

13 (4) PUBLIC OUTREACH.—The Director shall
14 publicly award prizes utilizing the Foundation's ex-
15 isting public affairs and public outreach resources.

16 (h) ADMINISTERING THE COMPETITION.—The Direc-
17 tor may enter into an agreement with a private, nonprofit
18 entity to administer the prize competition, subject to the
19 provisions of this section.

20 (i) INTELLECTUAL PROPERTY.—The Federal Gov-
21 ernment shall not, by virtue of offering or awarding a
22 prize under this section, be entitled to any intellectual
23 property rights derived as a consequence of, or in direct
24 relation to, the participation by a registered participant
25 in a competition authorized by this section. This sub-

1 section shall not be construed to prevent the Federal Gov-
2 ernment from negotiating a license for the use of intellec-
3 tual property developed for a prize competition under this
4 section.

5 (j) LIABILITY.—The Director may require a reg-
6 istered participant in a prize competition under this sec-
7 tion to waive liability against the Federal Government for
8 injuries and damages that result from participation in
9 such competition.

10 (k) NONSUBSTITUTION.—Any programs created
11 under this section shall not be considered a substitute for
12 Federal research and development programs.

13 (l) REPORTING REQUIREMENT.—Not later than 5
14 years after the date of enactment of this Act, the National
15 Science Board shall transmit to Congress a report con-
16 taining the results of a review and assessment of the pilot
17 program under this section, including—

18 (1) a description of the nature and status of all
19 completed or ongoing prize competitions carried out
20 under this section, including any scientific achieve-
21 ments, publications, intellectual property, or com-
22 mercialized technology that resulted from such com-
23 petitions;

1 (2) any recommendations regarding changes to,
2 the termination of, or continuation of the pilot pro-
3 gram;

4 (3) an analysis of whether the program is at-
5 tracting contestants more diverse than the Founda-
6 tion's traditional academic constituency;

7 (4) an analysis of whether public awareness of
8 innovation or of the goal of the particular prize or
9 prizes is enhanced;

10 (5) an analysis of whether the Foundation's
11 public image or ability to increase public scientific
12 literacy is enhanced through the use of innovation
13 inducement prizes; and

14 (6) an analysis of the extent to which private
15 funds are being used to support registered partici-
16 pants.

17 (m) EARLY TERMINATION OF CONTESTS.—The Di-
18 rector shall terminate a prize contest before any registered
19 participant wins if the Director determines that an unreg-
20 istered entity has produced an innovation that would oth-
21 erwise have qualified for the prize award.

22 (n) AUTHORIZATION OF APPROPRIATIONS.—

23 (1) IN GENERAL.—

24 (A) AWARDS.—There are authorized to be
25 appropriated to the Director for the period en-

1 compassing fiscal years 2011 through 2013
2 \$12,000,000 for carrying out this section.

3 (B) ADMINISTRATION.—Of the amounts
4 authorized in subparagraph (A), not more than
5 15 percent for each fiscal year shall be available
6 for the administrative costs of carrying out this
7 section.

8 (2) CARRYOVER OF FUNDS.—Funds appro-
9 priated for prize awards under this section shall re-
10 main available until expended, and may be trans-
11 ferred, reprogrammed, or expended for other pur-
12 poses as authorized by law only after the expiration
13 of 7 fiscal years after the fiscal year for which the
14 funds were originally appropriated. No provision in
15 this section permits obligation or payment of funds
16 in violation of section 1341 of title 31 of the United
17 States Code (commonly referred to as the Anti-Defi-
18 ciency Act).

19 **Subtitle C—STEM Education and**
20 **Workforce Training**

21 **SEC. 241. GRADUATE STUDENT SUPPORT.**

22 (a) FINDING.—The Congress finds that—

23 (1) the Integrative Graduate Education and Re-
24 search Traineeship program is an important pro-
25 gram for training the next generation of scientists

1 and engineers in team-based interdisciplinary re-
2 search and problem solving, and for providing them
3 with the many additional skills, such as communica-
4 tion skills, needed to thrive in diverse STEM ca-
5 reers; and

6 (2) the Integrative Graduate Education and Re-
7 search Traineeship program is no less valuable to
8 the preparation and support of graduate students
9 than the Foundation's Graduate Research Fellow-
10 ship program.

11 (b) EQUAL TREATMENT OF IGERT AND GRF.—Be-
12 ginning in fiscal year 2011, the Director shall increase or,
13 if necessary, decrease funding for the Foundation's Inte-
14 grative Graduate Education and Research Traineeship
15 program (or any program by which it is replaced) at least
16 at the same rate as it increases or decreases funding for
17 the Graduate Research Fellowship program.

18 (c) SUPPORT FOR GRADUATE STUDENT RESEARCH
19 FROM THE RESEARCH ACCOUNT.—For each of the fiscal
20 years 2011 through 2015, at least 50 percent of the total
21 Foundation funds allocated to the Integrative Graduate
22 Education and Research Traineeship program and the
23 Graduate Research Fellowship program shall come from
24 funds appropriated for Research and Related Activities.

1 (d) COST OF EDUCATION ALLOWANCE FOR GRF
2 PROGRAM.—Section 10 of the National Science Founda-
3 tion Act of 1950 (42 U.S.C. 1869) is amended—

4 (1) by inserting “(a)” before “The Foundation
5 is authorized”; and

6 (2) by adding at the end the following new sub-
7 section:

8 “(b) The Director shall establish for each year the
9 amount to be awarded for scholarships and fellowships
10 under this section for that year. Each such scholarship
11 and fellowship shall include a cost of education allowance
12 of \$12,000, subject to any restrictions on the use of cost
13 of education allowance as determined by the Director.”.

14 **SEC. 242. POSTDOCTORAL FELLOWSHIP IN STEM EDU-**
15 **CATION RESEARCH.**

16 (a) IN GENERAL.—The Director shall establish
17 postdoctoral fellowships in STEM education research to
18 provide recent doctoral degree graduates in STEM fields
19 with the necessary skills to assume leadership roles in
20 STEM education research, program development, and
21 evaluation in our Nation’s diverse educational institutions.

22 (b) AWARDS.—

23 (1) DURATION.—Fellowships may be awarded
24 under this section for a period of up to 24 months
25 in duration, renewable for an additional 12 months.

1 The Director shall establish criteria for eligibility for
2 renewal of the fellowship.

3 (2) STIPEND.—The Director shall determine
4 the amount of the award for a fellowship, which
5 shall include a stipend and a research allowance, and
6 may include an educational allowance.

7 (3) LOCATION.—A fellowship shall be awarded
8 for research at any institution of higher education
9 that offers degrees in fields supported by the Foun-
10 dation, or at any institution or organization that the
11 Director determines is eligible for education research
12 grants from the Foundation.

13 (4) NUMBER OF AWARDS.—The Director may
14 award up to 20 new fellowships per year.

15 (c) RESEARCH.—Fellowships under this section shall
16 be awarded for research on STEM education at any edu-
17 cational level, including grades pre-K–12, undergraduate,
18 graduate, and general public education, in both formal and
19 informal settings. Research topics may include—

20 (1) learning processes and progressions;

21 (2) knowledge transfer, including curriculum
22 development;

23 (3) uses of technology as teaching and learning
24 tools;

25 (4) integrating STEM fields; and

1 (5) assessment of student learning and program
2 evaluation.

3 (d) ELIGIBILITY.—To be eligible for a fellowship
4 under this section, an individual must—

5 (1) be a United States citizen or national, or an
6 alien lawfully admitted to the United States for per-
7 manent residence, at the time of application; and

8 (2) have received a doctoral degree in one of the
9 STEM fields supported by the Foundation within 3
10 years prior to the fellowship application deadline.

11 **SEC. 243. ROBERT NOYCE TEACHER SCHOLARSHIP PRO-**
12 **GRAM.**

13 (a) SECTION 10 AMENDMENTS.—Section 10 of the
14 National Science Foundation Authorization Act of 2002
15 (42 U.S.C. 1862n-1) is amended—

16 (1) in subsection (c)(4), by striking “Service re-
17 quired under this paragraph shall be performed in a
18 high-need local educational agency.”; and

19 (2) in subsection (c), by adding at the end a
20 new paragraph as follows:

21 “(5) EXCEPTION.—The period of service obliga-
22 tion under paragraph (4) shall be reduced by 1 year
23 for scholarship recipients whose service is performed
24 in a high-need local educational agency. The Direc-
25 tor shall establish and maintain a central clearing-

1 house of information on teaching opportunities avail-
2 able in high-need local educational agencies through-
3 out the United States, which shall be made available
4 to individuals having a service obligation under this
5 section.”.

6 (b) SECTION 10A AMENDMENTS.—Section 10A of
7 the National Science Foundation Authorization Act of
8 2002 (42 U.S.C. 1862n–1a) is amended in subsection
9 (h)(1) by striking “50” and inserting “30”.

10 **SEC. 244. INSTITUTIONS SERVING PERSONS WITH DISABIL-**
11 **ITIES.**

12 For the purposes of the activities and programs sup-
13 ported by the Foundation, institutions of higher education
14 chartered to serve large numbers of students with disabil-
15 ities, including Gallaudet University, Landmark College,
16 and the National Technical Institute for the Deaf, shall
17 be designated as minority-serving institutions.

18 **SEC. 245. INSTITUTIONAL INTEGRATION.**

19 (a) INNOVATION THROUGH INSTITUTIONAL INTE-
20 GRATION.—The Director shall award grants for the insti-
21 tutional integration of projects funded by the Foundation
22 with a focus on education, or on broadening participation
23 in STEM by underrepresented groups, for the purpose of
24 increasing collaboration and coordination across funded
25 projects and institutions and expanding the impact of such

1 projects within and among institutions of higher education
2 in an innovative and sustainable manner.

3 (b) PROGRAM ACTIVITIES.—The program under this
4 section shall support integrative activities that involve the
5 strategic and innovative combination of Foundation-fund-
6 ed projects and that provide for—

7 (1) additional opportunities to increase the re-
8 cruitment, retention, and degree attainment of
9 underrepresented groups in STEM disciplines;

10 (2) the inclusion of programming, practices,
11 and policies that encourage the integration of edu-
12 cation and research;

13 (3) seamless transitions from one educational
14 level to another; and

15 (4) other activities that expand and deepen the
16 impact of Foundation-funded projects with a focus
17 on education, or on broadening participation in
18 STEM by underrepresented groups, and enhance
19 their sustainability.

20 (c) REVIEW CRITERIA.—In selecting recipients of
21 grants under this section, the Director shall consider at
22 a minimum—

23 (1) the extent to which the proposed project ad-
24 dresses the goals of project and program integration
25 and adds value to the existing funded projects;

1 (2) the extent to which there is a proven record
2 of success for the existing projects on which the pro-
3 posed integration project is based; and

4 (3) the extent to which the proposed project ad-
5 dresses the modification of programming, practices,
6 and policies necessary to achieve the purpose de-
7 scribed in subsection (a).

8 (d) PRIORITY.—In selecting recipients of grants
9 under this section, the Director shall give priority to pro-
10 posals for which a senior institutional administrator, in-
11 cluding a dean or other administrator of equal or higher
12 rank, serves as the principal investigator.

13 **SEC. 246. POSTDOCTORAL RESEARCH FELLOWSHIPS.**

14 (a) IN GENERAL.—The Director shall establish a
15 Foundation-wide postdoctoral research fellowship pro-
16 gram, to award competitive, merit-based postdoctoral re-
17 search fellowships in any field of research supported by
18 the Foundation.

19 (b) DURATION AND AMOUNT.—Fellowships may be
20 awarded under this section for a period of up to 3 years
21 in duration. The Director shall determine the amount of
22 the award for a fellowship, which shall include a stipend
23 and a research allowance, and may include an educational
24 allowance.

1 (c) ELIGIBILITY.—To be eligible to receive a fellow-
2 ship under this section, an individual—

3 (1) must be a United States citizen or national,
4 or an alien lawfully admitted to the United States
5 for permanent residence, at the time of application;

6 (2) must have received a doctoral degree in any
7 field of research supported by the Foundation within
8 3 years prior to the fellowship application deadline,
9 or will complete a doctoral degree no more than 1
10 year after the application deadline; and

11 (3) may not have previously received funding as
12 the principal investigator of a research grant from
13 the Foundation, unless such funding was received as
14 a graduate student.

15 (d) PRIORITY.—In evaluating applications for fellow-
16 ships under this section, the Director shall give priority
17 to applications that include—

18 (1) proposals for interdisciplinary research; or

19 (2) proposals for high-risk, high-reward re-
20 search.

21 (e) ADDITIONAL CONSIDERATIONS.—In evaluating
22 applications for fellowships under this section, the Direc-
23 tor shall give consideration to the goal of promoting the
24 participation of individuals identified in section 33 or 34

1 of the Science and Engineering Equal Opportunities Act
2 (42 U.S.C. 1885a or 1885b).

3 (f) NONSUBSTITUTION.—The fellowship program au-
4 thorized under this section is not intended to replace or
5 reduce support for postdoctoral research through existing
6 programs at the Foundation.

7 **SEC. 247. BROADENING PARTICIPATION TRAINING AND**
8 **OUTREACH.**

9 The Director shall provide education and training—

10 (1) to Foundation staff and grant proposal re-
11 view panels on effective mechanisms and tools for
12 broadening participation in STEM by underrep-
13 resented groups, including reviewer selection and
14 mitigation of implicit bias in the review process; and

15 (2) to Foundation staff on related outreach ap-
16 proaches.

17 **SEC. 248. TRANSFORMING UNDERGRADUATE EDUCATION**
18 **IN STEM.**

19 Section 17 of the National Science Foundation Au-
20 thorization Act of 2002 (42 U.S.C. 1862n–6) is amended
21 to read as follows:

22 **“SEC. 17. TRANSFORMING UNDERGRADUATE EDUCATION**
23 **IN STEM.**

24 “(a) IN GENERAL.—The Director shall award grants,
25 on a competitive, merit-reviewed basis, to institutions of

1 higher education to reform undergraduate STEM edu-
2 cation for the purpose of increasing the number and qual-
3 ity of students studying toward and completing bacca-
4 laurate degrees in STEM and improving the STEM
5 learning outcomes for all undergraduate students, includ-
6 ing through—

7 “(1) development, implementation, and assess-
8 ment of innovative, research-based approaches to
9 transforming the teaching and learning of discipli-
10 nary or interdisciplinary STEM at the under-
11 graduate level; and

12 “(2) expansion of successful STEM reform ef-
13 forts beyond a single course or group of courses to
14 achieve reform within an entire academic unit, or ex-
15 pansion of successful reform efforts beyond a single
16 academic unit to other STEM academic units within
17 an institution or to comparable academic units at
18 other institutions.

19 “(b) USES OF FUNDS.—Activities supported by
20 grants under this section may include—

21 “(1) creation of multidisciplinary or inter-
22 disciplinary courses or programs that formalize col-
23 laborations for the purpose of improved student in-
24 struction and research in STEM;

1 “(2) expansion of undergraduate STEM re-
2 search opportunities to include interdisciplinary re-
3 search opportunities and research opportunities in
4 industry, at Federal labs, and at international re-
5 search institutions or research sites;

6 “(3) implementation or expansion of bridge, co-
7 hort, tutoring, or mentoring programs proven to en-
8 hance student recruitment or persistence to degree
9 completion in STEM, including programs that ad-
10 dress student transition from two-year to four-year
11 institutions;

12 “(4) improvement of undergraduate STEM
13 education for nonmajors, including education ma-
14 jors;

15 “(5) implementation of evidence-based, tech-
16 nology-driven reform efforts that directly impact un-
17 dergraduate STEM instruction or research experi-
18 ences;

19 “(6) development and implementation of faculty
20 and graduate teaching assistant development pro-
21 grams focused on improved instruction, mentoring,
22 assessment of student learning, and support of un-
23 dergraduate STEM students;

24 “(7) support for graduate students and
25 postdoctoral fellows to participate in instructional or

1 assessment activities at primarily undergraduate in-
2 stitutions; and

3 “(8) research on teaching and learning of
4 STEM at the undergraduate level related to the pro-
5 posed reform effort, including assessment and eval-
6 uation of the proposed reform activities, research on
7 scalability and sustainability of approaches to re-
8 form, and development and implementation of longi-
9 tudinal studies of students included in the proposed
10 reform effort.

11 “(c) PARTNERSHIP.—An institution of higher edu-
12 cation may partner with one or more other nonprofit edu-
13 cation or research organizations, including scientific and
14 engineering societies, for the purposes of carrying out the
15 activities authorized under this section.

16 “(d) SELECTION PROCESS.—

17 “(1) APPLICATIONS.—An institution of higher
18 education seeking a grant under this section shall
19 submit an application to the Director at such time,
20 in such manner, and containing such information as
21 the Director may require. The application shall in-
22 clude, at a minimum—

23 “(A) a description of the proposed reform
24 effort;

1 “(B) a description of the research findings
2 that will serve as the basis for the proposed re-
3 form effort or, in the case of applications that
4 propose an expansion of a previously imple-
5 mented reform effort, a description of the pre-
6 viously implemented reform effort, including in-
7 dicators of success such as data on student re-
8 cruitment, persistence to degree completion,
9 and academic achievement;

10 “(C) evidence of institutional support for,
11 and commitment to, the proposed reform effort,
12 including long-term commitment to implement
13 successful strategies from the current reform
14 effort beyond the academic unit or units in-
15 cluded in the grant proposal or to disseminate
16 successful strategies to other institutions;

17 “(D) a description of existing or planned
18 institutional policies and practices regarding
19 faculty hiring, promotion, tenure, and teaching
20 assignment that reward faculty contributions to
21 undergraduate STEM education; and

22 “(E) a description of the plans for assess-
23 ment and evaluation of the proposed reform ac-
24 tivities, including evidence of participation by

1 individuals with experience in assessment and
2 evaluation of teaching and learning programs.

3 “(2) REVIEW OF APPLICATIONS.—In selecting
4 grant recipients under this section, the Director
5 shall consider at a minimum—

6 “(A) the likelihood of success in under-
7 taking the proposed effort at the institution
8 submitting the application, including the extent
9 to which the faculty, staff, and administrators
10 of the institution are committed to making the
11 proposed institutional reform a priority of the
12 participating academic unit or units;

13 “(B) the degree to which the proposed re-
14 form will contribute to change in institutional
15 culture and policy such that a greater value is
16 placed on faculty engagement in undergraduate
17 education;

18 “(C) the likelihood that the institution will
19 sustain or expand the reform beyond the period
20 of the grant; and

21 “(D) the degree to which scholarly assess-
22 ment and evaluation plans are included in the
23 design of the reform effort, including the degree
24 to which such assessment and evaluation con-

1 tribute to the systematic accumulation of
2 knowledge on STEM education.

3 “(3) PRIORITY.—For proposals that include an
4 expansion of existing reform efforts beyond a single
5 academic unit, the Director shall give priority to
6 proposals for which a senior institutional adminis-
7 trator, including a dean or other administrator of
8 equal or higher rank, serves as the principal investi-
9 gator or a coprincipal investigator.

10 “(4) GRANT DISTRIBUTION.—The Director
11 shall ensure, to the extent practicable, that grants
12 awarded under this section are made to a variety of
13 types of institutions of higher education.”.

14 **SEC. 249. 21ST CENTURY GRADUATE EDUCATION.**

15 (a) IN GENERAL.—The Director shall award grants,
16 on a competitive, merit-reviewed basis, to institutions of
17 higher education to implement or expand research-based
18 reforms in master’s and doctoral level STEM education
19 that emphasize preparation for diverse careers utilizing
20 STEM degrees, including at diverse types of institutions
21 of higher education, in industry, and at government agen-
22 cies and research laboratories.

23 (b) USES OF FUNDS.—Activities supported by grants
24 under this section may include—

- 1 (1) creation of multidisciplinary or interdiscipli-
2 nary courses or programs for the purpose of im-
3 proved student instruction and research in STEM;
- 4 (2) expansion of graduate STEM research op-
5 portunities to include interdisciplinary research op-
6 portunities and research opportunities in industry,
7 at Federal laboratories, and at international re-
8 search institutions or research sites;
- 9 (3) development and implementation of future
10 faculty training programs focused on improved in-
11 struction, mentoring, assessment of student learn-
12 ing, and support of undergraduate STEM students;
- 13 (4) support and training for graduate students
14 to participate in instructional activities beyond the
15 traditional teaching assistantship, and especially as
16 part of ongoing educational reform efforts, including
17 at pre-K–12 schools, informal science education in-
18 stitutions, and primarily undergraduate institutions;
- 19 (5) creation, improvement, or expansion of in-
20 novative graduate programs such as science master’s
21 degree programs;
- 22 (6) development and implementation of semi-
23 nars, workshops, and other professional development
24 activities that increase the ability of graduate stu-

1 dents to engage in innovation, technology transfer,
2 and entrepreneurship;

3 (7) development and implementation of semi-
4 nars, workshops, and other professional development
5 activities that increase the ability of graduate stu-
6 dents to effectively communicate their research find-
7 ings to technical audiences outside of their own dis-
8 cipline and to nontechnical audiences;

9 (8) expansion of successful STEM reform ef-
10 forts beyond a single academic unit to other STEM
11 academic units within an institution or to com-
12 parable academic units at other institutions; and

13 (9) research on teaching and learning of STEM
14 at the graduate level related to the proposed reform
15 effort, including assessment and evaluation of the
16 proposed reform activities and research on scalability
17 and sustainability of approaches to reform.

18 (c) PARTNERSHIP.—An institution of higher edu-
19 cation may partner with one or more other nonprofit edu-
20 cation or research organizations, including scientific and
21 engineering societies, for the purposes of carrying out the
22 activities authorized under this section.

23 (d) SELECTION PROCESS.—

24 (1) APPLICATIONS.—An institution of higher
25 education seeking a grant under this section shall

1 submit an application to the Director at such time,
2 in such manner, and containing such information as
3 the Director may require. The application shall in-
4 clude, at a minimum—

5 (A) a description of the proposed reform
6 effort;

7 (B) in the case of applications that propose
8 an expansion of a previously implemented re-
9 form effort at the applicant's institution or at
10 other institutions, a description of the pre-
11 viously implemented reform effort;

12 (C) evidence of institutional support for,
13 and commitment to, the proposed reform effort,
14 including long-term commitment to implement
15 successful strategies from the current reform
16 effort beyond the academic unit or units in-
17 cluded in the grant proposal or to disseminate
18 successful strategies to other institutions; and

19 (D) a description of the plans for assess-
20 ment and evaluation of the grant proposed re-
21 form activities.

22 (2) REVIEW OF APPLICATIONS.—In selecting
23 grant recipients under this section, the Director
24 shall consider at a minimum—

1 (A) the likelihood of success in under-
2 taking the proposed effort at the institution
3 submitting the application, including the extent
4 to which the faculty, staff, and administrators
5 of the institution are committed to making the
6 proposed institutional reform a priority of the
7 participating academic unit or units;

8 (B) the degree to which the proposed re-
9 form will contribute to change in institutional
10 culture and policy such that a greater value is
11 placed on preparing graduate students for di-
12 verse careers utilizing STEM degrees;

13 (C) the likelihood that the institution will
14 sustain or expand the reform beyond the period
15 of the grant; and

16 (D) the degree to which scholarly assess-
17 ment and evaluation plans are included in the
18 design of the reform effort.

19 (e) REPEAL.—Section 7034 of the America COM-
20 PETES Act (42 U.S.C. 1862o–13) is repealed.

21 **SEC. 250. UNDERGRADUATE BROADENING PARTICIPATION**
22 **PROGRAM.**

23 (a) UNDERGRADUATE BROADENING PARTICIPATION
24 PROGRAM.—The Foundation shall continue to support the
25 Historically Black Colleges and Universities Under-

1 graduate Program, the Louis Stokes Alliances for Minor-
2 ity Participation Program, and the Tribal Colleges and
3 Universities Program as separate programs at least
4 through September 30, 2011.

5 (b) PLAN.—Prior to any realignment or consolidation
6 of the programs described in subsection (a), the Director
7 shall develop a plan clarifying the objectives and rationale
8 for such changes. The plan shall include a description of
9 how such changes would result in—

10 (1) meeting or strengthening the common goal
11 of the separate programs to increase the number of
12 individuals from underrepresented groups attaining
13 undergraduate STEM degrees; and

14 (2) addressing the unique needs of the different
15 types of minority serving institutions and underrep-
16 resented groups currently provided for by the sepa-
17 rate programs.

18 (c) RECOMMENDATIONS.—In the development of the
19 plan required under subsection (b), the Director shall at
20 a minimum—

21 (1) consider the recommendations and findings
22 of the National Academy of Sciences report required
23 by section 7032 of the America COMPETES Act
24 (Public Law 110–69); and

1 (2) solicit recommendations and feedback from
2 a wide range of stakeholders, including representa-
3 tives from minority serving institutions, other insti-
4 tutions of higher education, and other entities with
5 expertise on effective mechanisms to increase the re-
6 cruitment and retention of members of underrep-
7 resented groups in STEM fields, and the attainment
8 of STEM degrees by underrepresented groups.

9 (d) APPROVAL BY CONGRESS.—The plan developed
10 under this section shall be transmitted to Congress at least
11 3 months prior to the implementation of any realignment
12 or consolidation of the programs described in subsection
13 (a).

14 **SEC. 251. GRAND CHALLENGES IN EDUCATION RESEARCH.**

15 (a) IN GENERAL.—The Director and the Secretary
16 of Education shall collaborate in—

17 (1) identifying, prioritizing, and developing
18 strategies to address grand challenges in research
19 and development on the teaching and learning of
20 STEM at the pre-K–12 level, in formal and informal
21 settings, for diverse learning populations, including
22 individuals identified in section 33 or 34 of the
23 Science and Engineering Equal Opportunities Act
24 (42 U.S.C. 1885a or 1885b); and

1 (2) ensuring the dissemination of the results of
2 such research and development.

3 (b) STAKEHOLDER INPUT.—In identifying the grand
4 challenges required in subsection (a), the Director and the
5 Secretary shall—

6 (1) take into consideration critical research
7 gaps identified in existing reports, including reports
8 by the National Academies, on the teaching and
9 learning of STEM at the pre-K–12 level in formal
10 and informal settings; and

11 (2) solicit input from a wide range of stake-
12 holders, including local and State education officials,
13 STEM teachers, STEM education researchers, sci-
14 entific and engineering societies, STEM faculty at
15 institutions of higher education, informal STEM
16 education providers, businesses with a large STEM
17 workforce, and other stakeholders in the teaching
18 and learning of STEM at the pre-K–12 level, and
19 may enter into an arrangement with the National
20 Research Council for these purposes.

21 (c) TOPICS TO CONSIDER.—In identifying the grand
22 challenges required in subsection (a), the Director and the
23 Secretary shall, at a minimum, consider the following top-
24 ics:

1 (1) Research on scalability, sustainability, and
2 replication of successful STEM activities, programs,
3 and models, in formal and informal environments.

4 (2) Research that utilizes a systems approach
5 to identifying challenges and opportunities to im-
6 prove the teaching and learning of STEM, including
7 development of model systems that support improved
8 teaching and learning of STEM across entire school
9 districts and States, and encompassing and inte-
10 grating the teaching and learning of STEM in for-
11 mal and informal venues, and in K–12 schools and
12 institutions of higher education.

13 (3) Research to understand what makes a
14 STEM teacher effective and STEM teacher profes-
15 sional development effective, including development
16 of tools and methodologies to measure STEM teach-
17 er effectiveness.

18 (4) Research and development on cyber-enabled
19 tools and programs and television-based tools and
20 programs for learning and teaching STEM, includ-
21 ing development of tools and methodologies for as-
22 sessing cyber- and television-enabled teaching and
23 learning.

24 (5) Research and development on STEM teach-
25 ing and learning in informal environments, including

1 development of tools and methodologies for assessing
2 STEM teaching and learning in informal environ-
3 ments.

4 (6) Research and development on how inte-
5 grating engineering with mathematics and science
6 education may—

7 (A) improve student learning of mathe-
8 matics and science;

9 (B) increase student interest and persist-
10 ence in STEM; or

11 (C) improve student understanding of engi-
12 neering design principles and of the built world.

13 (d) REPORT TO CONGRESS.—Not later than 18
14 months after the date of enactment of this Act, the Direc-
15 tor and the Secretary shall report back to Congress with
16 a description of—

17 (1) the grand challenges identified pursuant to
18 this section;

19 (2) the role of each agency in supporting re-
20 search and development activities to address the
21 grand challenges;

22 (3) the common metrics that will be used to as-
23 sess progress toward meeting the grand challenges;

24 (4) plans for periodically updating the grand
25 challenges;

1 (5) how the agencies will disseminate the re-
2 sults of research and development activities carried
3 out under this section to STEM education practi-
4 tioners, to other Federal agencies that support
5 STEM programs and activities, and to non-Federal
6 funders of STEM education; and

7 (6) how the agencies will support implementa-
8 tion of best practices identified by the research and
9 development activities.

10 **SEC. 252. RESEARCH EXPERIENCES FOR UNDERGRADU-**
11 **ATES.**

12 (a) **RESEARCH SITES.**—The Director shall award
13 grants, on a merit-reviewed, competitive basis, to institu-
14 tions of higher education, nonprofit organizations, or con-
15 sortia of such institutions and organizations, for sites des-
16 ignated by the Director to provide research experiences for
17 10 or more undergraduate STEM students. The Director
18 shall ensure that—

19 (1) at least half of the students participating in
20 a program funded by a grant under this subsection
21 at each site shall be recruited from institutions of
22 higher education where research opportunities in
23 STEM are limited;

24 (2) the awards provide undergraduate research
25 experiences in a wide range of STEM disciplines;

1 (3) the awards support a variety of projects, in-
2 cluding independent investigator-led projects, inter-
3 disciplinary projects, and multi-institutional projects
4 (including virtual projects);

5 (4) students participating in each program
6 funded have mentors, including during the academic
7 year to the extent practicable, to help connect the
8 students' research experiences to the overall aca-
9 demic course of study and to help students achieve
10 success in courses of study leading to a bacca-
11 laureate degree in a STEM field;

12 (5) mentors and students are supported with
13 appropriate salary or stipends; and

14 (6) student participants are tracked, for em-
15 ployment and continued matriculation in STEM
16 fields, through receipt of the undergraduate degree
17 and for at least 3 years thereafter.

18 (b) INCLUSION OF UNDERGRADUATES IN STANDARD
19 RESEARCH GRANTS.—The Director shall require that
20 every recipient of a research grant from the Foundation
21 proposing to include 1 or more undergraduate students
22 in carrying out the research under the grant shall request
23 support, including stipend support, for such under-
24 graduate students as part of the research proposal itself
25 rather than as a supplement to the research proposal, un-

1 less such undergraduate participation was not foreseeable
2 at the time of the original proposal.

3 **TITLE III—STEM EDUCATION**

4 **SEC. 301. COORDINATION OF FEDERAL STEM EDUCATION.**

5 (a) **SHORT TITLE.**—This section may be cited as the
6 “STEM Education Coordination Act of 2010”.

7 (b) **DEFINITION.**—In this section, the term “STEM”
8 means science, technology, engineering, and mathematics.

9 (c) **ESTABLISHMENT.**—The Director of the Office of
10 Science and Technology Policy shall establish a committee
11 under the National Science and Technology Council with
12 the responsibility to coordinate Federal programs and ac-
13 tivities in support of STEM education, including at the
14 National Science Foundation, the Department of Energy,
15 the National Aeronautics and Space Administration, the
16 National Oceanic and Atmospheric Administration, the
17 Department of Education, and all other Federal agencies
18 that have programs and activities in support of STEM
19 education.

20 (d) **RESPONSIBILITIES OF THE COMMITTEE.**—The
21 committee established under subsection (c) shall—

22 (1) coordinate the STEM education activities
23 and programs of the Federal agencies;

1 (2) develop, implement through the partici-
2 pating agencies, and update once every 5 years a 5-
3 year STEM education strategic plan, which shall—

4 (A) specify and prioritize annual and long-
5 term objectives;

6 (B) specify the common metrics that will
7 be used to assess progress toward achieving the
8 objectives;

9 (C) describe the approaches that will be
10 taken by each participating agency to assess the
11 effectiveness of its STEM education programs
12 and activities; and

13 (D) with respect to subparagraph (A), de-
14 scribe the role of each agency in supporting
15 programs and activities designed to achieve the
16 objectives; and

17 (3) establish, periodically update, and maintain
18 an inventory of federally sponsored STEM education
19 programs and activities, including documentation of
20 assessments of the effectiveness of such programs
21 and activities and rates of participation by underrep-
22 resented minorities in such programs and activities.

23 (e) RESPONSIBILITIES OF OSTP.—The Director of
24 the Office of Science and Technology Policy shall encour-
25 age and monitor the efforts of the participating agencies

1 to ensure that the strategic plan under subsection (d)(2)
2 is developed and executed effectively and that the objec-
3 tives of the strategic plan are met.

4 (f) REPORT.—The Director of the Office of Science
5 and Technology Policy shall transmit a report annually to
6 Congress at the time of the President’s budget request de-
7 scribing the plan required under subsection (d)(2). The
8 annual report shall include—

9 (1) a description of the STEM education pro-
10 grams and activities for the previous and current fis-
11 cal years, and the proposed programs and activities
12 under the President’s budget request, of each par-
13 ticipating Federal agency;

14 (2) the levels of funding for each participating
15 Federal agency for the programs and activities de-
16 scribed under paragraph (1) for the previous fiscal
17 year and under the President’s budget request;

18 (3) except for the initial annual report, a de-
19 scription of the progress made in carrying out the
20 implementation plan, including a description of the
21 outcome of any program assessments completed in
22 the previous year, and any changes made to that
23 plan since the previous annual report; and

24 (4) a description of how the participating Fed-
25 eral agencies will disseminate information about fed-

1 erally supported resources for STEM education
2 practitioners, including teacher professional develop-
3 ment programs, to States and to STEM education
4 practitioners, including to teachers and administra-
5 tors in high-need schools, as defined in section 200
6 of the Higher Education Act of 1965 (20 U.S.C.
7 1021).

8 **SEC. 302. ADVISORY COMMITTEE ON STEM EDUCATION.**

9 (a) IN GENERAL.—The President shall establish or
10 designate an advisory committee on science, technology,
11 engineering, and mathematics (STEM) education.

12 (b) MEMBERSHIP.—The advisory committee estab-
13 lished or designated by the President under subsection (a)
14 shall be chaired by at least 2 members of the President’s
15 Council of Advisors on Science and Technology, with the
16 remaining advisory committee membership consisting of
17 non-Federal members who are specially qualified to pro-
18 vide the President with advice and information on STEM
19 education. Membership of the advisory committee, at a
20 minimum, shall include individuals from the following cat-
21 egories of individuals and organizations:

- 22 (1) STEM educator professional associations.
23 (2) Organizations that provide informal STEM
24 education activities.
25 (3) Institutions of higher education.

1 (4) Scientific and engineering professional soci-
2 eties.

3 (5) Business and industry associations.

4 (6) Foundations that fund STEM education ac-
5 tivities.

6 (c) RESPONSIBILITIES.—The responsibilities of the
7 advisory committee shall include—

8 (1) soliciting input from teachers, administra-
9 tors, local education agencies, States, and other pub-
10 lic and private STEM education stakeholder groups
11 for the purpose of informing the Federal agencies
12 that support STEM education programs on the
13 STEM education needs of States and school dis-
14 tricts;

15 (2) soliciting input from all STEM education
16 stakeholder groups regarding STEM education pro-
17 grams, including STEM education research pro-
18 grams, supported by Federal agencies;

19 (3) providing advice to the Federal agencies
20 that support STEM education programs on how
21 their programs can be better aligned with the needs
22 of States and school districts as identified in para-
23 graph (1), consistent with the mission of each agen-
24 cy; and

1 (4) offering guidance to the President on cur-
2 rent STEM education activities, research findings,
3 and best practices, with the purpose of increasing
4 connectivity between public and private STEM edu-
5 cation efforts.

6 **SEC. 303. STEM EDUCATION AT THE DEPARTMENT OF EN-**
7 **ERGY.**

8 (a) DEFINITIONS.—Section 5002 of the America
9 COMPETES Act (42 U.S.C. 16531) is amended—

10 (1) by redesignating paragraphs (2) through
11 (4) as paragraphs (3) through (5), respectively; and
12 (2) by inserting after paragraph (1) the fol-
13 lowing new paragraph:

14 “(2) ENERGY SYSTEMS SCIENCE AND ENGI-
15 NEERING.—The term ‘energy systems science and
16 engineering’ means—

17 “(A) nuclear science and engineering, in-
18 cluding—

19 “(i) nuclear engineering;

20 “(ii) nuclear chemistry;

21 “(iii) radiochemistry; and

22 “(iv) health physics;

23 “(B) hydrocarbon system science and engi-
24 neering, including—

- 1 “(i) petroleum or reservoir engineer-
- 2 ing;
- 3 “(ii) environmental geoscience;
- 4 “(iii) petrophysics;
- 5 “(iv) geophysics;
- 6 “(v) geochemistry;
- 7 “(vi) petroleum geology;
- 8 “(vii) ocean engineering; and
- 9 “(viii) environmental engineering;
- 10 “(C) energy efficiency and renewable en-
- 11 ergy technology systems science and engineer-
- 12 ing, including with respect to—
- 13 “(i) solar technology systems;
- 14 “(ii) wind technology systems;
- 15 “(iii) buildings technology systems;
- 16 “(iv) transportation technology sys-
- 17 tems;
- 18 “(v) hydropower systems; and
- 19 “(vi) geothermal systems; and
- 20 “(D) energy storage and distribution sys-
- 21 tems science and engineering, including with re-
- 22 spect to—
- 23 “(i) energy storage; and
- 24 “(ii) energy delivery.”.

1 (b) SCIENCE, TECHNOLOGY, ENGINEERING, AND
2 MATHEMATICS EDUCATION PROGRAMS.—Subpart B of
3 the Department of Energy Science Education Enhance-
4 ment Act (42 U.S.C. 7381g et seq.) is amended—

5 (1) in section 3170—

6 (A) by amending paragraph (1) to read as
7 follows:

8 “(1) DIRECTOR.—The term ‘Director’ means
9 the Director of STEM Education appointed or des-
10 ignated under section 3171(c)(1).”;

11 (B) by redesignating paragraph (2) as
12 paragraph (3);

13 (C) by inserting after paragraph (1) the
14 following new paragraph:

15 “(2) ENERGY SYSTEMS SCIENCE AND ENGI-
16 NEERING.—The term ‘energy systems science and
17 engineering’ means—

18 “(A) nuclear science and engineering, in-
19 cluding—

20 “(i) nuclear engineering;

21 “(ii) nuclear chemistry;

22 “(iii) radiochemistry; and

23 “(iv) health physics;

24 “(B) hydrocarbon system science and engi-
25 neering, including—

- 1 “(i) petroleum or reservoir engineer-
2 ing;
3 “(ii) environmental geoscience;
4 “(iii) petrophysics;
5 “(iv) geophysics;
6 “(v) geochemistry;
7 “(vi) petroleum geology;
8 “(vii) ocean engineering; and
9 “(viii) environmental engineering;
10 “(C) energy efficiency and renewable en-
11 ergy technology systems science and engineer-
12 ing, including with respect to—
13 “(i) solar technology systems;
14 “(ii) wind technology systems;
15 “(iii) buildings technology systems;
16 “(iv) transportation technology sys-
17 tems;
18 “(v) hydropower systems; and
19 “(vi) geothermal systems; and
20 “(D) energy storage and distribution sys-
21 tems science and engineering, including with re-
22 spect to—
23 “(i) energy storage; and
24 “(ii) energy delivery.”; and

1 (D) by adding at the end the following new
2 paragraph:

3 “(4) STEM.—The term ‘STEM’ means science,
4 technology, engineering, and mathematics.”;

5 (2) by striking chapters 1, 2, 3, 4, and 6;

6 (3) by inserting after section 3170 the following
7 new chapter:

8 **“CHAPTER 1—STEM EDUCATION**

9 **“SEC. 3171. STEM EDUCATION.**

10 “(a) IN GENERAL.—The Secretary of Energy shall
11 develop, conduct, support, promote, and coordinate formal
12 and informal educational activities at all levels that lever-
13 age the Department’s unique content expertise and facili-
14 ties to contribute to improving STEM education at all lev-
15 els in the United States, and to enhance awareness and
16 understanding of STEM, including energy sciences,
17 among the general public, with consideration given to the
18 goal of promoting the participation of individuals from
19 underrepresented groups in the STEM fields.

20 “(b) PROGRAMS.—The Secretary shall carry out evi-
21 dence-based programs designed to increase student inter-
22 est and participation, improve public literacy and support,
23 and improve the teaching and learning of energy systems
24 science and engineering and other STEM disciplines sup-

1 ported by the Department. Programs authorized under
2 this subsection may include—

3 “(1) informal educational programming de-
4 signed to excite and inspire students and the general
5 public about energy systems science and engineering
6 and other STEM disciplines supported by the De-
7 partment, while strengthening their content knowl-
8 edge in these fields;

9 “(2) teacher training and professional develop-
10 ment opportunities for pre-service and in-service ele-
11 mentary and secondary teachers designed to increase
12 the content knowledge of teachers in energy systems
13 science and engineering and other STEM disciplines
14 supported by the Department, including through
15 hands-on research experiences;

16 “(3) research opportunities for secondary school
17 students, including internships at the National Lab-
18 oratories, that provide secondary school students
19 with hands-on research experiences as well as expo-
20 sure to working scientists;

21 “(4) research opportunities at the National
22 Laboratories for undergraduate and graduate stu-
23 dents pursuing degrees in energy systems science
24 and engineering and other STEM disciplines sup-
25 ported by the Department; and

1 “(5) competitive scholarships, fellowships, and
2 traineeships for undergraduate and graduate stu-
3 dents in energy systems science and engineering and
4 other STEM disciplines supported by the Depart-
5 ment.

6 “(c) ORGANIZATION OF STEM EDUCATION PRO-
7 GRAMS.—

8 “(1) DIRECTOR OF STEM EDUCATION.—The
9 Secretary shall appoint or designate a Director of
10 STEM Education, who shall have the principal re-
11 sponsibility to oversee and coordinate all programs
12 and activities of the Department in support of
13 STEM education, including energy systems science
14 and engineering education, across all functions of
15 the Department.

16 “(2) QUALIFICATIONS.—The Director shall be
17 an individual, who by reason of professional back-
18 ground and experience, is specially qualified to ad-
19 vise the Secretary on all matters pertaining to
20 STEM education, including energy systems science
21 and engineering education, at the Department.

22 “(3) DUTIES.—The Director shall—

23 “(A) oversee and coordinate all programs
24 in support of STEM education, including en-

1 ergy systems science and engineering education,
2 across all functions of the Department;

3 “(B) represent the Department as the
4 principal interagency liaison for all STEM edu-
5 cation programs, unless otherwise represented
6 by the Secretary, the Under Secretary for
7 Science, or the Under Secretary for Energy;

8 “(C) prepare the annual budget and advise
9 the Under Secretary for Science and the Under
10 Secretary for Energy on all budgetary issues for
11 STEM education, including energy systems
12 science and engineering education, relative to
13 the programs of the Department;

14 “(D) establish, periodically update, and
15 maintain a publicly accessible online inventory
16 of STEM education programs and activities, in-
17 cluding energy systems science and engineering
18 education programs and activities;

19 “(E) develop, implement, and update the
20 Department of Energy STEM education stra-
21 tegic plan, as required by subsection (d);

22 “(F) increase, to the maximum extent
23 practicable, the participation and advancement
24 of women and underrepresented minorities at
25 every level of STEM education, including en-

1 energy systems science and engineering education;
2 and

3 “(G) perform such other matters relating
4 to STEM education as are required by the Sec-
5 retary, the Under Secretary for Science, or the
6 Under Secretary for Energy.

7 “(d) DEPARTMENT OF ENERGY STEM EDUCATION
8 STRATEGIC PLAN.—The Director of STEM education ap-
9 pointed or designated under subsection (c)(1) shall de-
10 velop, implement, and update once every 3 years a 3-year
11 STEM education strategic plan for the Department, which
12 shall—

13 “(1) identify and prioritize annual and long-
14 term STEM education goals and objectives for the
15 Department that are aligned with the overall goals
16 of the National Science and Technology Council
17 Committee on STEM Education Strategic plan;

18 “(2) describe the role of each program or activ-
19 ity of the Department in contributing to the goals
20 and objectives identified under paragraph (1);

21 “(3) specify the metrics that will be used to as-
22 sess progress toward achieving those goals and ob-
23 jectives; and

1 “(4) describe the approaches that will be taken
2 to assess the effectiveness of each STEM education
3 program and activity supported by the Department.

4 “(e) OUTREACH TO STUDENTS FROM UNDERREP-
5 RESENTED GROUPS.—In carrying out a program author-
6 ized under this section, the Secretary shall give consider-
7 ation to the goal of promoting the participation of individ-
8 uals identified in section 33 or 34 of the Science and Engi-
9 neering Equal Opportunities Act (42 U.S.C. 1885a or
10 1885b).

11 “(f) CONSULTATION AND PARTNERSHIP WITH
12 OTHER AGENCIES.—In carrying out the programs and ac-
13 tivities authorized under this section, the Secretary shall—

14 “(1) consult with the Secretary of Education
15 and the Director of the National Science Foundation
16 regarding activities designed to improve elementary
17 and secondary STEM education; and

18 “(2) consult and partner with the Director of
19 the National Science Foundation in carrying out
20 programs under this section designed to build capac-
21 ity in STEM education at the undergraduate and
22 graduate level, including by supporting excellent pro-
23 posals in energy systems science and engineering
24 that are submitted for funding to the Foundation’s
25 Advanced Technological Education Program.”; and

- 1 (4) in section 3191—
2 (A) in subsection (a)—
3 (i) by striking “web-based”; and
4 (ii) by inserting “and project-based
5 learning opportunities” after “laboratory
6 experiments”;
7 (B) in subsection (b)(1), by striking “the
8 science of energy” and inserting “energy sys-
9 tems science and engineering”; and
10 (C) by striking subsection (d).

11 (c) ENERGY APPLIED SCIENCE TALENT EXPANSION
12 PROGRAM FOR INSTITUTIONS OF HIGHER EDUCATION.—
13 Strike sections 5004 and 5005 of the America COM-
14 PETES Act (42 U.S.C. 16532 and 16533) and insert the
15 following new section:

16 **“SEC. 5004. ENERGY APPLIED SCIENCE TALENT EXPANSION**
17 **PROGRAM FOR INSTITUTIONS OF HIGHER**
18 **EDUCATION.**

19 “(a) PURPOSES.—The purposes of this section are—
20 “(1) to address the decline in the number of
21 and resources available to energy systems science
22 and engineering programs at institutions of higher
23 education, including community colleges; and
24 “(2) to increase the number of graduates with
25 degrees in energy systems science and engineering,

1 an area of strategic importance to the economic
2 competitiveness and energy security of the United
3 States.

4 “(b) ESTABLISHMENT.—The Secretary shall award
5 grants, on a competitive, merit-reviewed basis, to institu-
6 tions of higher education to implement or expand the en-
7 ergy systems science and engineering educational and
8 technical training capabilities of the institution, and to
9 provide merit-based financial support for master’s and
10 doctoral level students pursuing courses of study and re-
11 search in energy systems sciences and engineering.

12 “(c) USE OF FUNDS.—An institution of higher edu-
13 cation that receives a grant under this section may use
14 the grant to—

15 “(1) provide traineeships, including stipends
16 and cost of education allowances, to master’s and
17 doctoral students;

18 “(2) develop or expand multidisciplinary or
19 interdisciplinary courses or programs;

20 “(3) recruit and retain new faculty;

21 “(4) develop or improve core and specialized
22 course content;

23 “(5) encourage interdisciplinary and multidisci-
24 plinary research collaborations;

1 “(6) support outreach efforts to recruit stu-
2 dents; and

3 “(7) pursue opportunities for collaboration with
4 industry and National Laboratories.

5 “(d) CRITERIA.—Criteria for awarding a grant under
6 this section shall be based on—

7 “(1) the potential to attract new students to the
8 program;

9 “(2) academic rigor; and

10 “(3) the ability to offer hands-on education and
11 training opportunities for graduate students in the
12 emerging areas of energy systems science and engi-
13 neering.

14 “(e) PRIORITY.—The Secretary shall give priority to
15 proposals that involve active partnerships with a National
16 Laboratory or other energy systems science and engineer-
17 ing related entity, as determined by the Secretary.

18 “(f) DURATION AND AMOUNT.—

19 “(1) DURATION.—A grant under this section
20 may be for up to 5 years in duration.

21 “(2) AMOUNT.—An institution of higher edu-
22 cation that receives a grant under this section shall
23 be eligible for up to \$1,000,000 for each year of the
24 grant period.

1 “(g) AUTHORIZATION OF APPROPRIATIONS.—There
2 are authorized to be appropriated to the Secretary to carry
3 out this section—

4 “(1) \$30,000,000 for fiscal year 2011;

5 “(2) \$32,000,000 for fiscal year 2012;

6 “(3) \$36,000,000 for fiscal year 2013;

7 “(4) \$38,000,000 for fiscal year 2014; and

8 “(5) \$40,000,000 for fiscal year 2015.”.

9 (d) DEPARTMENT OF ENERGY EARLY CAREER
10 AWARDS FOR SCIENCE, ENGINEERING, AND MATHE-
11 MATICS RESEARCHERS.—Section 5006 of the America
12 COMPETES Act (42 U.S.C. 16534) is amended—

13 (1) in subsection (a), by striking “Director of
14 the Office” and all that follows through “shall
15 carry” and inserting “Secretary shall carry”;

16 (2) in subsection (b)(1)—

17 (A) in subparagraph (A), by inserting “per
18 year” after “\$80,000”; and

19 (B) in subparagraph (B), by striking
20 “\$125,000” and inserting “\$500,000 per year”;

21 (3) in subsection (c)(1), by striking “, as deter-
22 mined by the Director”;

23 (4) in subsections (c)(2), (e), (f), and (g), by
24 striking “Director” each place it appears and insert-
25 ing “Secretary”;

1 (5) in subsection (d), by striking “merit-re-
2 viewed” and inserting “merit-based, peer reviewed”;
3 and

4 (6) in subsection (h)—

5 (A) by striking “, acting through the Di-
6 rector,”; and

7 (B) by striking “\$25,000,000 for each fis-
8 cal years 2008 through 2010” and inserting
9 “such sums as are necessary”.

10 (e) PROTECTING AMERICA’S COMPETITIVE EDGE
11 (PACE) GRADUATE FELLOWSHIP PROGRAM.—Section
12 5009 of the America COMPETES Act (42 U.S.C. 16536)
13 is amended—

14 (1) in subsections (a) and (b), by inserting
15 “master’s or” before “doctoral”;

16 (2) in subsection (c)—

17 (A) in paragraph (1), by striking “involv-
18 ing written and oral interviews, that will result
19 in a wide distribution of awards throughout the
20 United States,”; and

21 (B) in paragraph (2)(B)(iv), by striking
22 “verbal and”;

23 (3) in subsection (d)(1)(B)(i), by inserting
24 “partial or full” before “graduate tuition”; and

25 (4) by striking subsection (f).

1 (f) REPEAL.—Section 3164 of the Department of En-
2 ergy Science Education Enhancement Act (42 U.S.C.
3 7381a) is repealed.

4 **TITLE IV—NATIONAL INSTITUTE**
5 **OF STANDARDS AND TECH-**
6 **NOLOGY**

7 **SEC. 401. SHORT TITLE.**

8 This title may be cited as the “National Institute of
9 Standards and Technology Authorization Act of 2010”.

10 **SEC. 402. AUTHORIZATION OF APPROPRIATIONS.**

11 (a) FISCAL YEAR 2011.—

12 (1) IN GENERAL.—There are authorized to be
13 appropriated to the Secretary of Commerce
14 \$1,012,100,000 for the National Institute of Stand-
15 ards and Technology for fiscal year 2011.

16 (2) SPECIFIC ALLOCATIONS.—Of the amount
17 authorized under paragraph (1)—

18 (A) \$620,000,000 shall be authorized for
19 scientific and technical research and services
20 laboratory activities;

21 (B) \$125,000,000 shall be authorized for
22 the construction and maintenance of facilities;
23 and

1 (C) \$267,100,000 shall be authorized for
2 industrial technology services activities, of
3 which—

4 (i) \$116,000,000 shall be authorized
5 for the Technology Innovation Program
6 under section 28 of the National Institute
7 of Standards and Technology Act (15
8 U.S.C. 278n);

9 (ii) \$141,100,000 shall be authorized
10 for the Manufacturing Extension Partner-
11 ship program under sections 25 and 26 of
12 such Act (15 U.S.C. 278k and 278l); and

13 (iii) \$10,000,000 shall be authorized
14 for the Malcolm Baldrige National Quality
15 Award program under section 17 of the
16 Stevenson-Wydler Technology Innovation
17 Act of 1980 (15 U.S.C. 3711a).

18 (b) FISCAL YEAR 2012.—

19 (1) IN GENERAL.—There are authorized to be
20 appropriated to the Secretary of Commerce
21 \$1,035,400,000 for the National Institute of Stand-
22 ards and Technology for fiscal year 2012.

23 (2) SPECIFIC ALLOCATIONS.—Of the amount
24 authorized under paragraph (1)—

1 (A) \$657,200,000 shall be authorized for
2 scientific and technical research and services
3 laboratory activities;

4 (B) \$85,000,000 shall be authorized for
5 the construction and maintenance of facilities;
6 and

7 (C) \$293,200,000 shall be authorized for
8 industrial technology services activities, of
9 which—

10 (i) \$132,000,000 shall be authorized
11 for the Technology Innovation Program
12 under section 28 of the National Institute
13 of Standards and Technology Act (15
14 U.S.C. 278n);

15 (ii) \$150,900,000 shall be authorized
16 for the Manufacturing Extension Partner-
17 ship program under sections 25 and 26 of
18 such Act (15 U.S.C. 278k and 278l); and

19 (iii) \$10,300,000 shall be authorized
20 for the Malcolm Baldrige National Quality
21 Award program under section 17 of the
22 Stevenson-Wydler Technology Innovation
23 Act of 1980 (15 U.S.C. 3711a).

24 (c) FISCAL YEAR 2013.—

1 (1) IN GENERAL.—There are authorized to be
2 appropriated to the Secretary of Commerce
3 \$1,137,809,000 for the National Institute of Stand-
4 ards and Technology for fiscal year 2013.

5 (2) SPECIFIC ALLOCATIONS.—Of the amount
6 authorized under paragraph (1)—

7 (A) \$696,700,000 shall be authorized for
8 scientific and technical research and services
9 laboratory activities;

10 (B) \$122,000,000 shall be authorized for
11 the construction and maintenance of facilities;
12 and

13 (C) \$319,109,000 shall be authorized for
14 industrial technology services activities, of
15 which—

16 (i) \$147,000,000 shall be authorized
17 for the Technology Innovation Program
18 under section 28 of the National Institute
19 of Standards and Technology Act (15
20 U.S.C. 278n);

21 (ii) \$161,500,000 shall be authorized
22 for the Manufacturing Extension Partner-
23 ship program under sections 25 and 26 of
24 such Act (15 U.S.C. 278k and 278l); and

1 (iii) \$10,609,000 shall be authorized
2 for the Malcolm Baldrige National Quality
3 Award program under section 17 of the
4 Stevenson-Wydler Technology Innovation
5 Act of 1980 (15 U.S.C. 3711a).

6 (d) FISCAL YEAR 2014.—

7 (1) IN GENERAL.—There are authorized to be
8 appropriated to the Secretary of Commerce
9 \$1,188,277,000 for the National Institute of Stand-
10 ards and Technology for fiscal year 2014.

11 (2) SPECIFIC ALLOCATIONS.—Of the amount
12 authorized under paragraph (1)—

13 (A) \$738,500,000 shall be authorized for
14 scientific and technical research and services
15 laboratory activities;

16 (B) \$124,000,000 shall be authorized for
17 the construction and maintenance of facilities;
18 and

19 (C) \$325,727,000 shall be authorized for
20 industrial technology services activities, of
21 which—

22 (i) \$142,000,000 shall be authorized
23 for the Technology Innovation Program
24 under section 28 of the National Institute

1 of Standards and Technology Act (15
2 U.S.C. 278n);

3 (ii) \$172,800,000 shall be authorized
4 for the Manufacturing Extension Partner-
5 ship program under sections 25 and 26 of
6 such Act (15 U.S.C. 278k and 278l); and

7 (iii) \$10,927,000 shall be authorized
8 for the Malcolm Baldrige National Quality
9 Award program under section 17 of the
10 Stevenson-Wydler Technology Innovation
11 Act of 1980 (15 U.S.C. 3711a).

12 (e) FISCAL YEAR 2015.—

13 (1) IN GENERAL.—There are authorized to be
14 appropriated to the Secretary of Commerce
15 \$1,255,955,000 for the National Institute of Stand-
16 ards and Technology for fiscal year 2015.

17 (2) SPECIFIC ALLOCATIONS.—Of the amount
18 authorized under paragraph (1)—

19 (A) \$782,800,000 shall be authorized for
20 scientific and technical research and services
21 laboratory activities;

22 (B) \$133,000,000 shall be authorized for
23 the construction and maintenance of facilities;
24 and

1 (C) \$340,155,000 shall be authorized for
2 industrial technology services activities, of
3 which—

4 (i) \$144,000,000 shall be authorized
5 for the Technology Innovation Program
6 under section 28 of the National Institute
7 of Standards and Technology Act (15
8 U.S.C. 278n);

9 (ii) \$184,900,000 shall be authorized
10 for the Manufacturing Extension Partner-
11 ship program under sections 25 and 26 of
12 such Act (15 U.S.C. 278k and 278l); and

13 (iii) \$11,255,000 shall be authorized
14 for the Malcolm Baldrige National Quality
15 Award program under section 17 of the
16 Stevenson-Wydler Technology Innovation
17 Act of 1980 (15 U.S.C. 3711a).

18 **SEC. 403. UNDER SECRETARY OF COMMERCE FOR STAND-**
19 **ARDS AND TECHNOLOGY.**

20 (a) IN GENERAL.—Section 5 of the Stevenson-
21 Wydler Technology Innovation Act of 1980 (15 U.S.C.
22 3704) is amended—

23 (1) in the heading, by striking “**EXPERI-**
24 **MENTAL PROGRAM TO STIMULATE COMPETI-**
25 **TIVE**” and inserting “**STANDARDS AND**”;

1 (2) in the heading in subsection (a), by striking
2 “PROGRAM ESTABLISHMENT” and inserting “ES-
3 TABLISHMENT OF EXPERIMENTAL PROGRAM TO
4 STIMULATE COMPETITIVE TECHNOLOGY”;

5 (3) by redesignating subsections (a) through (c)
6 as subsections (b) through (d), respectively; and

7 (4) by inserting before subsection (b), as so re-
8 designated, the following:

9 “(a) UNDER SECRETARY OF COMMERCE FOR STAND-
10 ARDS AND TECHNOLOGY.—

11 “(1) ESTABLISHMENT.—There shall be in the
12 Department of Commerce an Under Secretary of
13 Commerce for Standards and Technology who shall
14 serve as the Director of the National Institute of
15 Standards and Technology and perform such duties
16 as provided for in the National Institute of Stand-
17 ards and Technology Act (15 U.S.C. 271 et seq.)
18 and as the Secretary shall prescribe.

19 “(2) APPOINTMENT.—The Under Secretary of
20 Commerce for Standards and Technology shall be
21 appointed by the President by and with the advice
22 and consent of the Senate and shall be compensated
23 at the rate now or hereafter provided for level III of
24 the Executive Schedule Pay Rates (5 U.S.C. 5314).

1 “(3) APPLICABILITY.—The individual serving
2 on the date of enactment of the National Institute
3 of Standards and Technology Authorization Act of
4 2010 as the Director of the National Institute of
5 Standards and Technology shall also serve as the
6 Under Secretary of Commerce for Standards and
7 Technology until such time as a successor is ap-
8 pointed under paragraph (2).”.

9 (b) CONFORMING AMENDMENTS.—

10 (1) STEVENSON-WYDLER.—Subsection (c) of
11 section 5 of such Act (15 U.S.C. 3704), as redesign-
12 nated in subsection (a)(3), is amended to read as
13 follows:

14 “(c) COORDINATION.—To the extent practicable, in
15 carrying out subsection (b), the Secretary shall coordinate
16 the program established under such subsection with other
17 programs of the Department of Commerce.”.

18 (2) TITLE 5, UNITED STATES CODE.—

19 (A) LEVEL III.—Section 5314 of title 5,
20 United States Code, is amended by inserting
21 before the item “Associate Attorney General”
22 the following:

23 “Under Secretary of Commerce for Standards
24 and Technology, the incumbent of which also serves

1 as Director of the National Institute of Standards
2 and Technology.”.

3 (B) LEVEL IV.—Section 5315 of title 5,
4 United States Code, is amended by striking
5 “Director, National Institute of Standards and
6 Technology, Department of Commerce.”.

7 (3) NIST ACT.—Section 5 of the National In-
8 stitute of Standards and Technology Act (15 U.S.C.
9 274) is amended by striking the following: “The Di-
10 rector shall be compensated at the rate in effect for
11 level IV of the Executive Schedule under section
12 5315 of title 5, United States Code.”.

13 **SEC. 404. REORGANIZATION OF NIST LABORATORIES.**

14 (a) ORGANIZATION.—The Director shall reorganize
15 the scientific and technical research and services labora-
16 tory program into the following operational units:

17 (1) The Physical Measurement Laboratory,
18 whose mission is to realize and disseminate the na-
19 tional standards for length, mass, time and fre-
20 quency, electricity, temperature, force, and radiation
21 by activities including fundamental research in
22 measurement science, the provision of measurement
23 services and standards, and the provision of testing
24 facilities resources for use by the Federal Govern-
25 ment.

1 (2) The Information Technology Laboratory,
2 whose mission is to develop and disseminate stand-
3 ards, measurements, and testing capabilities for
4 interoperability, security, usability, and reliability of
5 information technologies, including cyber security
6 standards and guidelines for Federal agencies,
7 United States industry, and the public, through fun-
8 damental and applied research in computer science,
9 mathematics, and statistics.

10 (3) The Engineering Laboratory, whose mission
11 is to develop and disseminate advanced manufac-
12 turing and construction technologies to the United
13 States manufacturing and construction industries
14 through activities including measurement science re-
15 search, performance metrics, tools for engineering
16 applications, promotion of green infrastructure, and
17 energy efficiency measurements and standards.

18 (4) The Material Measurement Laboratory,
19 whose mission is to serve as the national reference
20 laboratory in biological, chemical, and material
21 sciences and engineering through activities including
22 fundamental research in the composition, structure,
23 and properties of biological and environmental mate-
24 rials and processes, the development of certified ref-
25 erence materials and critically evaluated data, and

1 other programs to assure measurement quality in
2 materials and biotechnology fields.

3 (5) The Center for Nanoscale Science and
4 Technology, a national shared-use facility for
5 nanoscale fabrication and measurement, whose mis-
6 sion is to develop innovative nanoscale measurement
7 and fabrication capabilities to support researchers
8 from industry, institutions of higher education, the
9 National Institute of Standards and Technology, and
10 other Federal agencies in nanoscale technology from
11 discovery to production.

12 (6) The NIST Center for Neutron Research, a
13 national shared-use facility, whose mission is to pro-
14 vide neutron-based measurement capabilities to re-
15 searchers from industry, institutions of higher edu-
16 cation, the National Institute of Standards and
17 Technology, and other Federal agencies in support
18 of materials research, nondestructive evaluation,
19 neutron imaging, chemical analysis, neutron stand-
20 ards, dosimetry, and radiation metrology.

21 (b) REVISION.—

22 (1) IN GENERAL.—Subsequent to the reorga-
23 nization required under subsection (a), the Director
24 may revise the organization of the scientific and
25 technical research and services laboratory program.

1 (2) REPORT TO CONGRESS.—Any revision to
2 the organization of such program under paragraph
3 (1) shall be submitted in a report to the Committee
4 on Science and Technology of the House of Rep-
5 resentatives and the Committee on Commerce,
6 Science, and Transportation of the Senate at least
7 60 days before the effective date of such revision.

8 **SEC. 405. FEDERAL GOVERNMENT STANDARDS AND CON-**
9 **FORMITY ASSESSMENT COORDINATION.**

10 (a) COORDINATION.—Section 2(b) of the National In-
11 stitute of Standards and Technology Act (15 U.S.C.
12 272(b)) is amended—

13 (1) in paragraph (12), by striking “and” after
14 the semicolon;

15 (2) in paragraph (13), by striking the period at
16 the end and inserting a semicolon; and

17 (3) by adding after paragraph (13) the fol-
18 lowing:

19 “(14) to promote collaboration among Federal
20 departments and agencies and private sector stake-
21 holders in the development and implementation of
22 standards and conformity assessment frameworks to
23 address specific Federal Government policy goals;
24 and

1 “(15) to convene Federal departments and
2 agencies, as appropriate, to—

3 “(A) coordinate and determine Federal
4 Government positions on specific policy issues
5 related to international technical standards and
6 conformity assessment-related activities; and

7 “(B) coordinate Federal department and
8 agency engagement in the development of inter-
9 national technical standards and conformity as-
10 sessment-related activities.”.

11 (b) REPORT.—The Director, in consultation with ap-
12 propriate Federal agencies, shall submit a report annually
13 to Congress addressing the Federal Government’s tech-
14 nical standards and conformity assessment-related activi-
15 ties. The report shall identify—

16 (1) current and anticipated international stand-
17 ards and conformity assessment-related issues that
18 have the potential to impact the competitiveness and
19 innovation capabilities of the United States;

20 (2) any action being taken by the Federal Gov-
21 ernment to address these issues and the Federal
22 agency taking that action; and

23 (3) any action that the Director is taking or
24 will take to ensure effective Federal Government en-
25 gagement on technical standards and conformity as-

1 assessment-related issues, as appropriate, where the
2 Federal Government is not effectively engaged.

3 **SEC. 406. MANUFACTURING EXTENSION PARTNERSHIP.**

4 (a) COMMUNITY COLLEGE SUPPORT.—Section 25(a)
5 of the National Institute of Standards and Technology Act
6 (15 U.S.C. 278k(a)) is amended—

7 (1) in paragraph (4), by striking “and” after
8 the semicolon;

9 (2) in paragraph (5), by striking the period at
10 the end and inserting “; and”; and

11 (3) by adding after paragraph (5) the following:

12 “(6) providing to community colleges informa-
13 tion about the job skills needed in small- and me-
14 dium-sized manufacturing businesses in the regions
15 they serve.”.

16 (b) INNOVATIVE SERVICES INITIATIVE.—

17 (1) IN GENERAL.—Section 25 of such Act (15
18 U.S.C. 278k) is amended by adding at the end the
19 following:

20 “(g) INNOVATIVE SERVICES INITIATIVE.—

21 “(1) ESTABLISHMENT.—The Director may es-
22 tablish, within the Centers program under this sec-
23 tion, an innovative services initiative to assist small-
24 and medium-sized manufacturers in—

1 “(A) reducing their energy usage and envi-
2 ronmental waste to improve profitability; and

3 “(B) accelerating the domestic commer-
4 cialization of new product technologies, includ-
5 ing components for renewable energy systems.

6 “(2) MARKET DEMAND.—The Director may not
7 undertake any activity to accelerate the domestic
8 commercialization of a new product technology
9 under this subsection unless an analysis of market
10 demand for the new product technology has been
11 conducted.”.

12 (2) GRANTS.—Section 33 of such Act (15
13 U.S.C. 278r) is amended by adding at the end the
14 following:

15 “(g) INNOVATIVE SERVICES.—The Director may
16 make awards under this section to carry out the innovative
17 services initiative under section 25(g).”.

18 (c) REPORTS.—Section 25 of such Act (15 U.S.C.
19 278k) is further amended by adding at the end the fol-
20 lowing:

21 “(h) REPORTS.—

22 “(1) IN GENERAL.—In submitting the 3-year
23 programmatic planning document and annual up-
24 dates under section 23, the Director shall include an

1 assessment of the Director's governance of the pro-
2 gram established under this section.

3 “(2) CRITERIA.—In conducting such assess-
4 ment, the Director shall use the criteria established
5 pursuant to the Malcolm Baldrige National Quality
6 Award under section 17(d)(1)(C) of the Stevenson-
7 Wydler Technology Innovation Act of 1980 (15
8 U.S.C. 3711a(d)(1)(C)).”.

9 (d) HOLLINGS MANUFACTURING EXTENSION PART-
10 NERSHIP PROGRAM COST-SHARING.—Section 25(e) of
11 such Act (15 U.S.C. 278k(e)) is amended by adding at
12 the end the following:

13 “(7) Notwithstanding paragraphs (1), (3), and
14 (5), for fiscal year 2011 through fiscal year 2015,
15 the Secretary may not provide to a Center more
16 than 50 percent of the costs incurred by such Center
17 and may not require that a Center's cost share ex-
18 ceed 50 percent.

19 “(8) Not later than 4 years after the date of
20 enactment of the National Institute of Standards
21 and Technology Authorization Act of 2010, the Sec-
22 retary shall submit to Congress a report on the cost
23 share requirements under the program. The report
24 shall—

1 “(A) discuss various cost share structures,
2 including the cost share structure in place prior
3 to such date of enactment and the cost share
4 structure in place under paragraph (7), and the
5 effect of such cost share structures on indi-
6 vidual Centers and the overall program; and

7 “(B) include a recommendation for how
8 best to structure the cost share requirement
9 after fiscal year 2015 to provide for the long-
10 term sustainability of the program.”.

11 (e) ADVISORY BOARD.—Section 25(e)(4) of such Act
12 (15 U.S.C. 278k(e)(4)) is amended to read as follows:

13 “(4) FEDERAL ADVISORY COMMITTEE ACT AP-
14 PLICABILITY.—

15 “(A) IN GENERAL.—In discharging its du-
16 ties under this subsection, the MEP Advisory
17 Board shall function solely in an advisory ca-
18 pacity, in accordance with the Federal Advisory
19 Committee Act.

20 “(B) EXCEPTION.—Section 14 of the Fed-
21 eral Advisory Committee Act shall not apply to
22 the MEP Advisory Board.”.

23 (f) DEFINITIONS.—Section 25 of such Act (15 U.S.C.
24 278k) is further amended by adding at the end the fol-
25 lowing:

1 “(i) DEFINITION.—In this section, the term ‘commu-
2 nity college’ means an institution of higher education (as
3 defined under section 101(a) of the Higher Education Act
4 of 1965 (20 U.S.C. 1001(a))) at which the highest degree
5 that is predominately awarded to students is an associate’s
6 degree.”.

7 **SEC. 407. BIOSCIENCE RESEARCH PROGRAM.**

8 (a) IN GENERAL.—The National Institute of Stand-
9 ards and Technology Act (15 U.S.C. 271 et seq.) is
10 amended—

11 (1) by redesignating section 34 as section 35;

12 and

13 (2) by inserting after section 33 the following:

14 **“SEC. 34. BIOSCIENCE RESEARCH PROGRAM.**

15 “(a) IN GENERAL.—The Director shall establish a
16 bioscience research program to support research and de-
17 velopment of standard reference materials, measurements,
18 methods, and genomic and other data to advance—

19 “(1) biological drug research and development;

20 “(2) molecular diagnostics;

21 “(3) medical imaging technologies; and

22 “(4) personalized medicine.

23 “(b) UNIVERSITY RESEARCH CENTERS.—

24 “(1) ESTABLISHMENT.—The Director may es-
25 tablish research centers at institutions of higher edu-

1 cation (in this section referred to as ‘university re-
2 search centers’) through a competitive application
3 process to conduct research that furthers the objec-
4 tives of the bioscience research program.

5 “(2) APPLICATION.—

6 “(A) IN GENERAL.—An institution of high-
7 er education seeking to establish a university
8 research center under this subsection shall sub-
9 mit an application to the Director at such time,
10 in such manner, and containing such informa-
11 tion and assurances as the Director may re-
12 quire.

13 “(B) COMPONENTS.—The application shall
14 include, at a minimum, a description of—

15 “(i) the relevant research and instruc-
16 tional capacity of the applicant;

17 “(ii) the research projects that will be
18 undertaken by the applicant;

19 “(iii) the extent to which the applicant
20 will partner with industry and the role in-
21 dustry will play in the research undertaken
22 by the university research center;

23 “(iv) how the applicant will dissemi-
24 nate research results effectively; and

1 “(v) the metrics that will be used to
2 evaluate the success of the projects under
3 clause (ii) and the contribution of the uni-
4 versity research center in furthering the
5 objectives of the bioscience research pro-
6 gram.

7 “(C) SPECIAL CONSIDERATION.—The Di-
8 rector shall give special consideration to an ap-
9 plication from an institution of higher education
10 that is—

11 “(i) an 1890 Institution, as defined in
12 section 2 of the Agricultural Research, Ex-
13 tension, and Education Reform Act of
14 1998 (7 U.S.C. 7061);

15 “(ii) a Predominantly Black Institu-
16 tion, as defined in section 318 of the High-
17 er Education Act of 1965 (20 U.S.C.
18 1059e);

19 “(iii) a part B institution, as defined
20 in section 322 of the Higher Education
21 Act of 1965 (20 U.S.C. 1061);

22 “(iv) a Tribal College or University,
23 as defined in section 316 of the Higher
24 Education Act of 1965 (20 U.S.C. 1059e);

1 “(v) a Native American-serving, non-
2 tribal institution, as defined in section 319
3 of the Higher Education Act of 1965 (20
4 U.S.C. 1059f);

5 “(vi) an Asian American and Native
6 American Pacific Islander-serving institu-
7 tion, as defined in section 320 of the High-
8 er Education Act of 1965 (20 U.S.C.
9 1059g);

10 “(vii) an Alaska Native-serving insti-
11 tution, as defined in section 317 of the
12 Higher Education Act of 1965 (20 U.S.C.
13 1059d);

14 “(viii) a Native Hawaiian-serving in-
15 stitution, as defined in section 317 of the
16 Higher Education Act of 1965 (20 U.S.C.
17 1059d); or

18 “(ix) a Hispanic-serving institution,
19 as defined in section 502 of the Higher
20 Education Act of 1965 (20 U.S.C. 1101a).

21 “(3) ASSESSMENT.—Not later than 3 years
22 after the date on which a university research center
23 is established and every 3 years thereafter, the Di-
24 rector shall evaluate the university research center

1 for its contributions to the bioscience research pro-
2 gram.

3 “(4) ANNUAL MEETING.—If the Director estab-
4 lishes more than 1 university research center, the
5 Director shall convene an annual meeting of re-
6 searchers from all of the university research centers
7 and the Institute to foster collaboration and commu-
8 nication.

9 “(c) USER FACILITY.—The Director may establish a
10 bioscience user facility to provide access to advanced or
11 unique equipment, services, materials, and other resources
12 to industry, institutions of higher education, nonprofit or-
13 ganizations, and government agencies to perform research
14 and testing.

15 “(d) POSTDOCTORAL FELLOWS.—The Director shall,
16 to the extent practicable, assign 1 or more fellows from
17 the postdoctoral fellowship program established in section
18 19 to the bioscience research program.

19 “(e) PROGRAMMATIC PLANNING DOCUMENT.—The
20 Director shall ensure that the updates to the pro-
21 grammatic planning document transmitted to Congress
22 under section 23(d) include the bioscience research pro-
23 gram.

24 “(f) DEFINITIONS.—In this section:

1 “(1) BIOSCIENCE RESEARCH PROGRAM.—The
2 term ‘bioscience research program’ means the re-
3 search and development program authorized under
4 subsection (a).

5 “(2) INSTITUTION OF HIGHER EDUCATION.—
6 The term ‘institution of higher education’ has the
7 same meaning given the term in section 101(a) of
8 the Higher Education Act of 1965 (20 U.S.C.
9 1001(a)).”.

10 (b) VISITING COMMITTEE ON ADVANCED TECH-
11 NOLOGY AMENDMENTS.—Section 10 of the National Insti-
12 tute of Standards and Technology Act (15 U.S.C. 278)
13 is amended—

14 (1) in subsection (a)—

15 (A) by striking “15 members” and insert-
16 ing “at least 15, but not more than 20, mem-
17 bers”; and

18 (B) by striking “at least 10” and inserting
19 “at least 13”; and

20 (2) in subsection (h)(1), by striking “Program
21 established under section 28” and inserting “pro-
22 grams established under sections 28 and 34”.

1 **SEC. 408. TIP ADVISORY BOARD.**

2 Section 28(k)(4) of the National Institute of Stand-
3 ards and Technology Act (15 U.S.C. 278n(k)(4)) is
4 amended to read as follows:

5 “(4) FEDERAL ADVISORY COMMITTEE ACT AP-
6 PLICABILITY.—

7 “(A) IN GENERAL.—In discharging its du-
8 ties under this subsection, the TIP Advisory
9 Board shall function solely in an advisory ca-
10 pacity, in accordance with the Federal Advisory
11 Committee Act.

12 “(B) EXCEPTION.—Section 14 of the Fed-
13 eral Advisory Committee Act shall not apply to
14 the TIP Advisory Board.”.

15 **SEC. 409. UNDERREPRESENTED MINORITIES.**

16 (a) RESEARCH FELLOWSHIPS.—Section 18 of the
17 National Institute of Standards and Technology Act (15
18 U.S.C. 278g-1) is amended by adding at the end the fol-
19 lowing:

20 “(c) UNDERREPRESENTED MINORITIES.—In evalu-
21 ating applications for fellowships under this section, the
22 Director shall give consideration to the goal of promoting
23 the participation of underrepresented minorities in re-
24 search areas supported by the Institute.”.

25 (b) POSTDOCTORAL FELLOWSHIP PROGRAM.—Sec-
26 tion 19 of such Act (15 U.S.C. 278g-2) is amended by

1 adding at the end the following: “In evaluating applica-
2 tions for fellowships under this section, the Director shall
3 give consideration to the goal of promoting the partici-
4 tion of underrepresented minorities in research areas sup-
5 ported by the Institute.”.

6 (c) **TEACHER DEVELOPMENT.**—Section 19A(c) of
7 such Act (15 U.S.C. 278g–2a(c)) is amended by adding
8 at the end the following: “The Director shall give priority
9 to an application from a teacher from a high-need school,
10 as defined in section 200 of the Higher Education Act of
11 1965 (20 U.S.C. 1021).”.

12 **SEC. 410. CYBER SECURITY STANDARDS AND GUIDELINES.**

13 Cyber security standards and guidelines developed by
14 the National Institute of Standards and Technology for
15 use by United States industry and the public shall be vol-
16 untary.

17 **SEC. 411. DEFINITIONS.**

18 In this title:

19 (1) **DIRECTOR.**—The term “Director” means
20 the Director of the National Institute of Standards
21 and Technology.

22 (2) **FEDERAL AGENCY.**—The term “Federal
23 agency” has the meaning given such term in section
24 4 of the Stevenson-Wydler Technology Innovation
25 Act of 1980 (15 U.S.C. 3703).

1 **TITLE V—INNOVATION**

2 **SEC. 501. OFFICE OF INNOVATION AND ENTREPRENEUR-**
3 **SHIP.**

4 The Stevenson-Wydler Technology Innovation Act of
5 1980 (15 U.S.C. 3701 et seq.) is amended by adding at
6 the end the following new section:

7 **“SEC. 24. OFFICE OF INNOVATION AND ENTREPRENEUR-**
8 **SHIP.**

9 “(a) IN GENERAL.—The Secretary shall establish an
10 Office of Innovation and Entrepreneurship to foster inno-
11 vation and the commercialization of new technologies,
12 products, processes, and services with the goal of pro-
13 moting productivity and economic growth in the United
14 States.

15 “(b) DUTIES.—The Office of Innovation and Entre-
16 preneurship shall be responsible for—

17 “(1) developing and advocating policies to accel-
18 erate innovation and advance the commercialization
19 of research and development, including federally
20 funded research and development;

21 “(2) identifying existing barriers to innovation
22 and commercialization, including access to capital
23 and other resources, and ways to overcome those
24 barriers;

1 to small- or medium-sized manufacturers for the use or
2 production of innovative technologies.

3 “(b) ELIGIBLE PROJECTS.—A loan guarantee may be
4 made under such program only for a project that reequips,
5 expands, or establishes a manufacturing facility in the
6 United States to—

7 “(1) use an innovative technology or an innova-
8 tive process in manufacturing; or

9 “(2) manufacture an innovative technology
10 product or an integral component of such product.

11 “(c) ELIGIBLE BORROWER.—A loan guarantee may
12 be made under such program only for a borrower who is
13 a small- or medium-sized manufacturer, as determined by
14 the Secretary under the criteria established pursuant to
15 subsection (m).

16 “(d) LIMITATION ON AMOUNT.—A loan guarantee
17 shall not exceed an amount equal to 80 percent of the
18 project cost, as estimated at the time at which the loan
19 guarantee is issued.

20 “(e) LIMITATIONS ON LOAN GUARANTEE.—No loan
21 guarantee shall be made unless the Secretary determines
22 that—

23 “(1) there is a reasonable prospect of repay-
24 ment of the principal and interest on the obligation
25 by the borrower;

1 “(2) the amount of the obligation (when com-
2 bined with amounts available to the borrower from
3 other sources) is sufficient to carry out the project;

4 “(3) the obligation is not subordinate to other
5 financing;

6 “(4) the obligation bears interest at a rate that
7 does not exceed a level that the Secretary determines
8 appropriate, taking into account the prevailing rate
9 of interest in the private sector for similar loans and
10 risks; and

11 “(5) the term of an obligation requires full re-
12 payment over a period not to exceed the lesser of—

13 “(A) 30 years; or

14 “(B) 90 percent of the projected useful
15 life, as determined by the Secretary, of the
16 physical asset to be financed by the obligation.

17 “(f) DEFAULTS.—

18 “(1) PAYMENT BY SECRETARY.—

19 “(A) IN GENERAL.—If a borrower defaults
20 (as defined in regulations promulgated by the
21 Secretary and specified in the loan guarantee)
22 on the obligation, the holder of the loan guar-
23 antee shall have the right to demand payment
24 of the unpaid amount from the Secretary.

1 “(B) PAYMENT REQUIRED.—Within such
2 period as may be specified in the loan guar-
3 antee or related agreements, the Secretary shall
4 pay to the holder of the loan guarantee the un-
5 paid interest on and unpaid principal of the ob-
6 ligation as to which the borrower has defaulted,
7 unless the Secretary finds that there was no de-
8 fault by the borrower in the payment of interest
9 or principal or that the default has been rem-
10 edied.

11 “(C) FORBEARANCE.—Nothing in this sub-
12 section precludes any forbearance by the holder
13 of the obligation for the benefit of the borrower
14 which may be agreed upon by the parties to the
15 obligation and approved by the Secretary.

16 “(2) SUBROGATION.—

17 “(A) IN GENERAL.—If the Secretary
18 makes a payment under paragraph (1), the Sec-
19 retary shall be subrogated to the rights, as
20 specified in the loan guarantee, of the recipient
21 of the payment or related agreements including,
22 if appropriate, the authority (notwithstanding
23 any other provision of law) to—

24 “(i) complete, maintain, operate,
25 lease, or otherwise dispose of any property

1 of the borrower from funds appropriated for that purpose
2 the principal and interest payments that become due and
3 payable on the unpaid balance of the obligation if the Sec-
4 retary finds that—

5 “(1)(A) the borrower is unable to make the
6 payments and is not in default;

7 “(B) it is in the public interest to permit the
8 borrower to continue to pursue the project; and

9 “(C) the probable net benefit to the Federal
10 Government in paying the principal and interest will
11 be greater than that which would result in the event
12 of a default;

13 “(2) the amount of the payment that the Sec-
14 retary is authorized to pay shall be no greater than
15 the amount of principal and interest that the bor-
16 rower is obligated to pay under the obligation being
17 guaranteed; and

18 “(3) the borrower agrees to reimburse the Sec-
19 retary for the payment (including interest) on terms
20 and conditions that are satisfactory to the Secretary.

21 “(h) TERMS AND CONDITIONS.—A loan guarantee
22 under this section shall include such detailed terms and
23 conditions as the Secretary determines appropriate to—

24 “(1) protect the interests of the United States
25 in the case of default; and

1 of the borrower from funds appropriated for that purpose
2 the principal and interest payments that become due and
3 payable on the unpaid balance of the obligation if the Sec-
4 retary finds that—

5 “(1)(A) the borrower is unable to make the
6 payments and is not in default;

7 “(B) it is in the public interest to permit the
8 borrower to continue to pursue the project; and

9 “(C) the probable net benefit to the Federal
10 Government in paying the principal and interest will
11 be greater than that which would result in the event
12 of a default;

13 “(2) the amount of the payment that the Sec-
14 retary is authorized to pay shall be no greater than
15 the amount of principal and interest that the bor-
16 rower is obligated to pay under the obligation being
17 guaranteed; and

18 “(3) the borrower agrees to reimburse the Sec-
19 retary for the payment (including interest) on terms
20 and conditions that are satisfactory to the Secretary.

21 “(h) TERMS AND CONDITIONS.—A loan guarantee
22 under this section shall include such detailed terms and
23 conditions as the Secretary determines appropriate to—

24 “(1) protect the interests of the United States
25 in the case of default; and

1 “(2) have available all the patents and tech-
2 nology necessary for any person selected, including
3 the Secretary, to complete and operate the project.

4 “(i) CONSULTATION.—In establishing the terms and
5 conditions of a loan guarantee under this section, the Sec-
6 retary shall consult with the Secretary of the Treasury.

7 “(j) FEES.—

8 “(1) IN GENERAL.—The Secretary shall charge
9 and collect fees for loan guarantees in amounts the
10 Secretary determines are sufficient to cover applica-
11 ble administrative expenses.

12 “(2) AVAILABILITY.—Fees collected under this
13 subsection shall—

14 “(A) be deposited by the Secretary into the
15 Treasury of the United States; and

16 “(B) remain available until expended, sub-
17 ject to such other conditions as are contained in
18 annual appropriations Acts.

19 “(k) RECORDS.—

20 “(1) IN GENERAL.—With respect to a loan
21 guarantee under this section, the borrower, the lend-
22 er, and any other appropriate party shall keep such
23 records and other pertinent documents as the Sec-
24 retary shall prescribe by regulation, including such

1 records as the Secretary may require to facilitate an
2 effective audit.

3 “(2) ACCESS.—The Secretary and the Comp-
4 troller General of the United States, or their duly
5 authorized representatives, shall have access to
6 records and other pertinent documents for the pur-
7 pose of conducting an audit.

8 “(1) FULL FAITH AND CREDIT.—The full faith and
9 credit of the United States is pledged to the payment of
10 all loan guarantees issued under this section with respect
11 to principal and interest.

12 “(m) REGULATIONS.—The Secretary shall issue final
13 regulations before making any loan guarantees under the
14 program. Such regulations shall include—

15 “(1) criteria that the Secretary shall use to de-
16 termine eligibility for loan guarantees under this sec-
17 tion, including whether a borrower is a small- or me-
18 dium-sized manufacturer;

19 “(2) a determination of what expenses shall and
20 shall not be included in project costs;

21 “(3) policies and procedures for selecting and
22 monitoring lenders and loan performance; and

23 “(4) any other policies, procedures, or informa-
24 tion necessary to implement this section.

25 “(n) AUDIT.—

1 “(1) ANNUAL INDEPENDENT AUDITS.—The
2 Secretary shall enter into an arrangement with an
3 independent auditor for annual evaluations of the
4 program under this section.

5 “(2) ANNUAL REVIEW.—The Comptroller Gen-
6 eral shall conduct an annual review of the Sec-
7 retary’s execution of the program under this section.

8 “(3) REPORT.—The results of the independent
9 audit under paragraph (1) and the Comptroller Gen-
10 eral’s review under paragraph (2) shall be provided
11 directly to the Committee on Science and Tech-
12 nology of the House of Representatives and the
13 Committee on Commerce, Science, and Transpor-
14 tation of the Senate.

15 “(o) REPORT TO CONGRESS.—Concurrent with the
16 submission to Congress of the President’s annual budget
17 request in each year after the date of enactment of this
18 section, the Secretary shall transmit to the Committee on
19 Science and Technology of the House of Representatives
20 and the Committee on Commerce, Science, and Transpor-
21 tation of the Senate a report containing a summary of
22 all activities carried out under this section.

23 “(p) COORDINATION AND NONDUPLICATION.—To
24 the maximum extent practicable, the Secretary shall en-
25 sure that the activities carried out under this section are

1 coordinated with, and do not duplicate the efforts of, other
2 loan guarantee programs within the Federal Government.

3 “(q) MEP CENTERS.—The Secretary may use cen-
4 ters established under section 25 of the National Institute
5 of Standards and Technology Act (15 U.S.C. 278k) to
6 provide information about the program established under
7 this section and to conduct outreach to potential bor-
8 rowers, as appropriate.

9 “(r) DEFINITIONS.—In this section:

10 “(1) COST.—The term ‘cost’ has the meaning
11 given such term under section 502 of the Federal
12 Credit Reform Act of 1990 (2 U.S.C. 661a).

13 “(2) INNOVATIVE PROCESS.—The term ‘innova-
14 tive process’ means a process that is significantly
15 improved as compared to the process in general use
16 in the commercial marketplace in the United States
17 at the time the loan guarantee is issued.

18 “(3) INNOVATIVE TECHNOLOGY.—The term ‘in-
19 novative technology’ means a technology that is sig-
20 nificantly improved as compared to the technology in
21 general use in the commercial marketplace in the
22 United States at the time the loan guarantee is
23 issued.

24 “(4) LOAN GUARANTEE.—The term ‘loan guar-
25 antee’ has the meaning given such term in section

1 502 of the Federal Credit Reform Act of 1990 (2
2 U.S.C. 661a). The term includes a loan guarantee
3 commitment (as defined in section 502 of such Act
4 (2 U.S.C. 661a)).

5 “(5) OBLIGATION.—The term ‘obligation’
6 means the loan or other debt obligation that is guar-
7 anteed under this section.

8 “(6) PROGRAM.—The term ‘program’ means
9 the loan guarantee program established in sub-
10 section (a).

11 “(s) AUTHORIZATION OF APPROPRIATIONS.—There
12 are authorized to be appropriated such sums as are nec-
13 essary to provide the cost of loan guarantees under this
14 section.”.

15 **SEC. 503. REGIONAL INNOVATION PROGRAM.**

16 The Stevenson-Wydler Technology Innovation Act of
17 1980 (15 U.S.C. 3701 et seq.) is further amended by add-
18 ing after section 25, as added by section 502 of this title,
19 the following new section:

20 **“SEC. 26. REGIONAL INNOVATION PROGRAM.**

21 “(a) ESTABLISHMENT.—The Secretary shall estab-
22 lish a regional innovation program to encourage and sup-
23 port the development of regional innovation strategies, in-
24 cluding regional innovation clusters.

25 “(b) REGIONAL INNOVATION CLUSTER GRANTS.—

1 “(1) IN GENERAL.—As part of the program es-
2 tablished under subsection (a), the Secretary may
3 award grants on a competitive basis to eligible re-
4 cipients for activities relating to the formation and
5 development of regional innovation clusters.

6 “(2) PERMISSIBLE ACTIVITIES.—Grants award-
7 ed under this subsection may be used for activities
8 determined appropriate by the Secretary including—

9 “(A) feasibility studies;

10 “(B) planning activities;

11 “(C) technical assistance;

12 “(D) developing or strengthening commu-
13 nication and collaboration between and among
14 participants of a regional innovation cluster;

15 “(E) attracting additional participants to a
16 regional innovation cluster;

17 “(F) facilitating market development of
18 products or services provided by a regional in-
19 novation cluster; and

20 “(G) developing relationships between a re-
21 gional innovation cluster and entities or clusters
22 in other regions.

23 “(3) ELIGIBLE RECIPIENT.—For purposes of
24 this subsection, the term ‘eligible recipient’ means
25 any of the following:

- 1 “(A) A State.
- 2 “(B) An Indian tribe.
- 3 “(C) A city or other political subdivision of
4 a State.
- 5 “(D) An entity that—
- 6 “(i) is a nonprofit organization, an in-
7 stitution of higher education, a public-pri-
8 vate partnership, or an economic develop-
9 ment organization or similar entity; and
- 10 “(ii) has an application that is sup-
11 ported by a State or a political subdivision
12 of a State.
- 13 “(E) A consortium of any of the entities
14 listed in subparagraphs (A) through (D).
- 15 “(4) APPLICATION.—
- 16 “(A) IN GENERAL.—An applicant shall
17 submit an application to the Secretary at such
18 time, in such manner, and containing such in-
19 formation and assurances as the Secretary may
20 require.
- 21 “(B) COMPONENTS.—The application shall
22 include, at a minimum, a description of the re-
23 gional innovation cluster supported by the pro-
24 posed activity, including a description of—

1 “(i) whether the regional innovation
2 cluster is supported by the private sector,
3 State and local governments, and other rel-
4 evant stakeholders;

5 “(ii) how the existing participants in
6 the regional innovation cluster will encour-
7 age and solicit participation by all types of
8 entities that might benefit from participa-
9 tion, including newly formed entities and
10 those rival to existing participants;

11 “(iii) the extent to which the regional
12 innovation cluster is likely to stimulate in-
13 novation and have a positive impact on re-
14 gional economic growth and development;

15 “(iv) whether the participants in the
16 regional innovation cluster have access to,
17 or contribute to, a well-trained workforce;

18 “(v) whether the participants in the
19 regional innovation cluster are capable of
20 attracting additional funds from non-Fed-
21 eral sources; and

22 “(vi) the likelihood that the partici-
23 pants in the regional innovation cluster will
24 be able to sustain activities once grant

1 funds under this subsection have been ex-
2 pended.

3 “(5) COST SHARE.—The Secretary may not
4 provide more than 50 percent of the total cost of
5 any activity funded under this subsection.

6 “(6) USE AND APPLICATION OF RESEARCH AND
7 INFORMATION PROGRAM.—To the maximum extent
8 practicable, the Secretary shall ensure that activities
9 funded under this subsection use and apply any rel-
10 evant research, best practices, and metrics developed
11 under the program established in subsection (c).

12 “(c) REGIONAL INNOVATION RESEARCH AND INFOR-
13 MATION PROGRAM.—

14 “(1) IN GENERAL.—As part of the program es-
15 tablished under subsection (a), the Secretary shall
16 establish a regional innovation research and infor-
17 mation program to—

18 “(A) gather, analyze, and disseminate in-
19 formation on best practices for regional innova-
20 tion strategies (including regional innovation
21 clusters), including information relating to how
22 innovation, productivity, and economic develop-
23 ment can be maximized through such strategies;

24 “(B) provide technical assistance, including
25 through the development of technical assistance

1 guides, for the development and implementation
2 of regional innovation strategies (including re-
3 gional innovation clusters);

4 “(C) support the development of relevant
5 metrics and measurement standards to evaluate
6 regional innovation strategies (including re-
7 gional innovation clusters), including the extent
8 to which such strategies stimulate innovation,
9 productivity, and economic development; and

10 “(D) collect and make available data on re-
11 gional innovation cluster activity in the United
12 States, including data on—

13 “(i) the size, specialization, and com-
14 petitiveness of regional innovation clusters;

15 “(ii) the regional domestic product
16 contribution, total jobs and earnings by
17 key occupations, establishment size, nature
18 of specialization, patents, Federal research
19 and development spending, and other rel-
20 evant information for regional innovation
21 clusters; and

22 “(iii) supply chain product and service
23 flows within and between regional innova-
24 tion clusters.

1 “(2) RESEARCH GRANTS.—The Secretary may
2 award research grants on a competitive basic to sup-
3 port and further the goals of the program estab-
4 lished under this subsection.

5 “(3) DISSEMINATION OF INFORMATION.—Data
6 and analysis compiled by the Secretary under the
7 program established in this subsection shall be made
8 available to other Federal agencies, State and local
9 governments, and nonprofit and for-profit entities.

10 “(4) CLUSTER GRANT PROGRAM.—The Sec-
11 retary shall incorporate data and analysis relating to
12 any regional innovation cluster supported by a grant
13 under subsection (b) into the program established
14 under this subsection.

15 “(d) INTERAGENCY COORDINATION.—

16 “(1) IN GENERAL.—To the maximum extent
17 practicable, the Secretary shall ensure that the ac-
18 tivities carried out under this section are coordinated
19 with, and do not duplicate the efforts of, other pro-
20 grams at the Department of Commerce and other
21 Federal agencies.

22 “(2) COLLABORATION.—The Secretary shall ex-
23 plore and pursue ways to collaborate with other Fed-
24 eral agencies, including through multiagency funding
25 opportunities, on regional innovation strategies.

1 “(e) EVALUATION.—

2 “(1) IN GENERAL.—Not later than 4 years
3 after the date of enactment of this section, the Sec-
4 retary shall enter into a contract with an inde-
5 pendent entity, such as the National Academy of
6 Sciences, to conduct an evaluation of the program
7 established under subsection (a).

8 “(2) REQUIREMENTS.—The evaluation shall in-
9 clude—

10 “(A) whether such program is achieving its
11 goals;

12 “(B) any recommendations for how such
13 program may be improved; and

14 “(C) a recommendation as to whether such
15 program should be continued or terminated.

16 “(f) REGIONAL INNOVATION CLUSTER DEFINED.—
17 The term ‘regional innovation cluster’ means a geographi-
18 cally bounded network of similar, synergistic, or com-
19 plimentary entities that—

20 “(1) are engaged in or with a particular indus-
21 try sector;

22 “(2) have active channels for business trans-
23 actions and communication;

24 “(3) share specialized infrastructure, labor mar-
25 kets, and services; and

1 “(4) leverage the region’s unique competitive
2 strengths to stimulate innovation and create jobs.

3 “(g) AUTHORIZATION OF APPROPRIATIONS.—There
4 are authorized to be appropriated such sums as are nec-
5 essary for each of fiscal years 2011 through 2015 to carry
6 out this section, including such sums as are necessary to
7 carry out the evaluation required under subsection (e).”.

8 **TITLE VI—DEPARTMENT OF**
9 **ENERGY**
10 **Subtitle A—Office of Science**

11 **SEC. 601. SHORT TITLE.**

12 This subtitle may be cited as the “Department of En-
13 ergy Office of Science Authorization Act of 2010”.

14 **SEC. 602. DEFINITIONS.**

15 Except as otherwise provided, in this subtitle:

16 (1) DEPARTMENT.—The term “Department”
17 means the Department of Energy.

18 (2) DIRECTOR.—The term “Director” means
19 the Director of the Office of Science.

20 (3) OFFICE OF SCIENCE.—The term “Office of
21 Science” means the Department of Energy Office of
22 Science.

23 (4) SECRETARY.—The term “Secretary” means
24 the Secretary of Energy.

1 **SEC. 603. MISSION OF THE OFFICE OF SCIENCE.**

2 (a) MISSION.—The mission of the Office of Science
3 shall be the delivery of scientific discoveries and major sci-
4 entific tools to transform the understanding of nature and
5 to advance the energy, economic, and national security of
6 the United States.

7 (b) DUTIES.—In support of this mission, the Sec-
8 retary shall carry out, through the Office of Science, pro-
9 grams on basic energy sciences, biological and environ-
10 mental research, advanced scientific computing research,
11 fusion energy sciences, high energy physics, and nuclear
12 physics through activities focused on—

13 (1) Science for Discovery to unravel nature’s
14 mysteries through the study of subatomic particles,
15 atoms, and molecules that make up the materials of
16 our everyday world to DNA, proteins, cells, and en-
17 tire biological systems;

18 (2) Science for National Need by—

19 (A) advancing a clean energy agenda
20 through basic research on energy production,
21 storage, transmission, and use; and

22 (B) advancing our understanding of the
23 Earth’s climate through basic research in at-
24 mospheric and environmental sciences and cli-
25 mate change; and

1 (3) National Scientific User Facilities to deliver
2 the 21st century tools of science, engineering, and
3 technology and provide the Nation's researchers with
4 the most advanced tools of modern science including
5 accelerators, colliders, supercomputers, light sources
6 and neutron sources, and facilities for studying the
7 nanoworld.

8 (e) SUPPORTING ACTIVITIES.—The activities de-
9 scribed in subsection (b) shall include providing for rel-
10 evant facilities and infrastructure, analysis, coordination,
11 and education and outreach activities.

12 (d) USER FACILITIES.—The Director shall carry out
13 the construction, operation, and maintenance of user fa-
14 cilities to support the activities described in subsection (b).
15 As practicable, these facilities shall serve the needs of the
16 Department, industry, the academic community, and other
17 relevant entities for the purposes of advancing the mis-
18 sions of the Department.

19 (e) OTHER AUTHORIZED ACTIVITIES.—In addition to
20 the activities authorized under this subtitle, the Office of
21 Science shall carry out such other activities it is author-
22 ized or required to carry out by law.

23 (f) COORDINATION AND JOINT ACTIVITIES.—The
24 Department's Under Secretary for Science shall ensure
25 the coordination of activities under this subtitle with the

1 other activities of the Department, and shall support joint
2 activities among the programs of the Department.

3 **SEC. 604. BASIC ENERGY SCIENCES PROGRAM.**

4 (a) PROGRAM.—As part of the activities authorized
5 under section 603, the Director shall carry out a program
6 in basic energy sciences, including materials sciences and
7 engineering, chemical sciences, biosciences, and geo-
8 sciences, for the purpose of providing the scientific founda-
9 tions for new energy technologies.

10 (b) BASIC ENERGY SCIENCES USER FACILITIES.—

11 (1) IN GENERAL.—The Director shall carry out
12 a program for the construction, operation, and main-
13 tenance of national user facilities to support the pro-
14 gram under this section. As practicable, these facili-
15 ties shall serve the needs of the Department, indus-
16 try, the academic community, and other relevant en-
17 tities to create and examine new materials and
18 chemical processes for the purposes of advancing
19 new energy technologies and improving the competi-
20 tiveness of the United States. These facilities shall
21 include—

- 22 (A) x-ray light sources;
- 23 (B) neutron sources;
- 24 (C) electron beam microcharacterization
25 centers;

1 (D) nanoscale science research centers;
2 and

3 (E) other facilities the Director considers
4 appropriate, consistent with section 603(d).

5 (2) FACILITY CONSTRUCTION AND UP-
6 GRADES.—Consistent with the Office of Science’s
7 project management practices, the Director shall
8 support construction of—

9 (A) the National Synchrotron Light Source
10 II;

11 (B) a Second Target Station at the Spall-
12 ation Neutron Source; and

13 (C) an upgrade of the Advanced Photon
14 Source to improve brightness and performance.

15 (c) ENERGY FRONTIER RESEARCH CENTERS.—

16 (1) IN GENERAL.—The Director shall carry out
17 a grant program to provide awards, on a competi-
18 tive, merit-reviewed basis, to multi-institutional col-
19 laborations or other appropriate entities to conduct
20 fundamental and use-inspired energy research to ac-
21 celerate scientific breakthroughs related to needs
22 identified in—

23 (A) the Grand Challenges report of the De-
24 partment’s Basic Energy Sciences Advisory
25 Committee;

1 (B) the Basic Energy Sciences Basic Re-
2 search Needs workshop reports;

3 (C) energy-related Grand Challenges for
4 Engineering, as described by the National
5 Academy of Engineering; or

6 (D) other relevant reports identified by the
7 Director.

8 (2) COLLABORATIONS.—A collaboration receiv-
9 ing a grant under this subsection may include mul-
10 tiple types of institutions and private sector entities.

11 (3) SELECTION AND DURATION.—

12 (A) IN GENERAL.—A collaboration under
13 this subsection shall be selected for a period of
14 5 years.

15 (B) REAPPLICATION.—After the end of the
16 period described in subparagraph (A), a grantee
17 may reapply for selection for a second period of
18 5 years on a competitive, merit-reviewed basis.

19 (4) NO FUNDING FOR CONSTRUCTION.—No
20 funding provided pursuant to this subsection may be
21 used for the construction of new buildings or facili-
22 ties.

23 (d) ACCELERATOR RESEARCH AND DEVELOP-
24 MENT.—The Director shall carry out research and devel-
25 opment on advanced accelerator technologies relevant to

1 the development of Basic Energy Sciences user facilities,
2 in consultation with the Office of Science's High Energy
3 Physics and Nuclear Physics programs.

4 **SEC. 605. BIOLOGICAL AND ENVIRONMENTAL RESEARCH**
5 **PROGRAM.**

6 (a) IN GENERAL.—As part of the activities author-
7 ized under section 603, the Director shall carry out a pro-
8 gram of research, development, demonstration, and com-
9 mercial application in the areas of biological systems
10 science and climate and environmental science to support
11 the energy and environmental missions of the Department.

12 (b) BIOLOGICAL SYSTEMS SCIENCE SUBPROGRAM.—

13 (1) SUBPROGRAM.—As part of the activities au-
14 thorized under subsection (a), the Director shall
15 carry out a subprogram of research, development,
16 and demonstration on fundamental, structural, com-
17 putational, and systems biology to increase systems-
18 level understanding of complex biological systems,
19 which shall include activities to—

20 (A) accelerate breakthroughs and new
21 knowledge that will enable cost-effective sus-
22 tainable production of biomass-based liquid
23 transportation fuels, bioenergy, and biobased
24 products that minimize greenhouse gas emis-
25 sions;

1 (B) improve understanding of the global
2 carbon cycle, including processes for removing
3 carbon dioxide from the atmosphere, through
4 photosynthesis and other biological processes,
5 for sequestration and storage; and

6 (C) understand the biological mechanisms
7 used to destroy, immobilize, or remove contami-
8 nants from subsurface environments, including
9 at facilities of the Department.

10 (2) RESEARCH PLAN.—Not later than 1 year
11 after the date of enactment of this Act, and at least
12 once every 3 years thereafter, the Director shall pre-
13 pare and transmit to Congress a research plan de-
14 scribing how the subprogram authorized under this
15 subsection will be undertaken.

16 (3) BIOENERGY RESEARCH CENTERS.—

17 (A) IN GENERAL.—In carrying out the
18 subprogram under paragraph (1), the Director
19 shall support at least 3 bioenergy research cen-
20 ters to accelerate basic biological research, de-
21 velopment, demonstration, and commercial ap-
22 plication of biomass-based liquid transportation
23 fuels, bioenergy, and biobased products that re-
24 duce greenhouse gas emissions and are pro-

1 duced from a variety of regionally diverse feed-
2 stocks.

3 (B) GEOGRAPHIC DISTRIBUTION.—The Di-
4 rector shall ensure that the bioenergy research
5 centers under this paragraph are established in
6 geographically diverse locations.

7 (C) SELECTION AND DURATION.—A center
8 established under subparagraph (A) shall be se-
9 lected on a competitive, merit-reviewed basis for
10 a period of 5 years beginning on the date of es-
11 tablishment of that center. A center already in
12 existence on the date of enactment of this Act
13 may continue to receive support for a period of
14 5 years beginning on the date of establishment
15 of that center.

16 (4) ENABLING SYNTHETIC BIOLOGY PLAN.—

17 (A) IN GENERAL.—The Secretary, in con-
18 sultation with other relevant Federal agencies,
19 the academic community, research-based non-
20 profit entities, and the private sector, shall de-
21 velop a comprehensive plan for federally sup-
22 ported research and development activities that
23 will support the energy and environmental mis-
24 sions of the Department and accelerate the

1 growth of a competitive synthetic biology indus-
2 try in the United States.

3 (B) PLAN.—The plan developed under sub-
4 paragraph (A) shall assess the need to create a
5 database for synthetic biology information, the
6 need and process for developing standards for
7 biological parts, components and systems, and
8 the need for a federally funded facility that en-
9 ables the discovery, design, development, pro-
10 duction, and systematic use of parts, compo-
11 nents, and systems created through synthetic
12 biology. The plan shall describe the role of the
13 Federal Government in meeting these needs.

14 (C) SUBMISSION TO CONGRESS.—The Sec-
15 retary shall transmit the plan developed under
16 subparagraph (A) to the Congress not later
17 than 9 months after the date of enactment of
18 this Act.

19 (5) COMPUTATIONAL BIOLOGY AND SYSTEMS
20 BIOLOGY KNOWLEDGEBASE.—As part of the subpro-
21 gram described in paragraph (1), the Director shall
22 carry out research in computational biology, acquire
23 or otherwise ensure the availability of hardware for
24 biology-specific computation, and establish and
25 maintain an open virtual database and information

1 management system to centrally integrate systems
2 biology data, analytical software, and computational
3 modeling tools that will allow data sharing and free
4 information exchange in the scientific community.

5 (6) REPEAL.—Section 977 of the Energy Policy
6 Act of 2005 (42 U.S.C. 16317) is repealed.

7 (c) CLIMATE AND ENVIRONMENTAL SCIENCES SUB-
8 PROGRAM.—

9 (1) IN GENERAL.—As part of the activities au-
10 thorized under subsection (a), the Director shall
11 carry out a subprogram of climate and environ-
12 mental science research, which shall include activi-
13 ties to—

14 (A) understand, observe, and model the re-
15 sponse of the Earth's atmosphere and bio-
16 sphere, including oceans, to increased green-
17 house gas emissions, and any associated
18 changes in climate;

19 (B) sequester, destroy, immobilize, or re-
20 move contaminants and carbon from subsurface
21 environments, including at facilities of the De-
22 partment; and

23 (C) develop potential mitigation and adap-
24 tation options for increased greenhouse gas

1 emissions and any associated changes in cli-
2 mate.

3 (2) SUBSURFACE BIOGEOCHEMISTRY RE-
4 SEARCH.—

5 (A) IN GENERAL.—As part of the subpro-
6 gram described in paragraph (1), the Director
7 shall carry out research to advance a funda-
8 mental understanding of coupled physical,
9 chemical, and biological processes for control-
10 ling the movement of sequestered carbon and
11 subsurface environmental contaminants, includ-
12 ing field observations of subsurface microorga-
13 nisms and field-scale subsurface research.

14 (B) COORDINATION.—

15 (i) DIRECTOR.—The Director shall
16 carry out activities under this paragraph in
17 accordance with priorities established by
18 the Department's Under Secretary for
19 Science to support and accelerate the de-
20 contamination of relevant facilities man-
21 aged by the Department.

22 (ii) UNDER SECRETARY FOR
23 SCIENCE.—The Department's Under Sec-
24 retary for Science shall ensure the coordi-
25 nation of the activities of the Department,

1 including activities under this paragraph,
2 to support and accelerate the decontamina-
3 tion of relevant facilities managed by the
4 Department.

5 (3) NEXT-GENERATION ECOSYSTEM-CLIMATE
6 EXPERIMENT.—

7 (A) IN GENERAL.—The Director, in col-
8 laboration with other relevant agencies that are
9 participants in the United States Global
10 Change Research Program, shall carry out the
11 selection and development of a next-generation
12 ecosystem-climate change experiment to under-
13 stand the impact and feedbacks of increased
14 temperature and elevated carbon levels on eco-
15 systems.

16 (B) REPORT.—Not later than 1 year after
17 the date of enactment of this Act, the Director
18 shall transmit to the Congress a report con-
19 taining—

20 (i) an identification of the location or
21 locations that have been selected for the
22 experiment described in subparagraph (A);

23 (ii) a description of the need for addi-
24 tional experiments; and

25 (iii) an associated research plan.

1 (4) AMERIFLUX NETWORK COORDINATION AND
2 RESEARCH.—As part of the subprogram described in
3 paragraph (1), the Director shall carry out research
4 and coordinate the AmeriFlux Network to directly
5 observe and understand the exchange of greenhouse
6 gases, water, and energy within terrestrial eco-
7 systems and the response of those systems to climate
8 change and other dynamic terrestrial landscape
9 changes. The Director, in collaboration with other
10 relevant Federal agencies, shall—

11 (A) identify opportunities to incorporate
12 innovative and emerging observation tech-
13 nologies and practices into the existing Net-
14 work;

15 (B) conduct research to determine the
16 need for increased greenhouse gas observation
17 facilities across North America to meet future
18 mitigation and adaptation needs of the United
19 States; and

20 (C) examine how the technologies and
21 practices described in subparagraph (A), and
22 increased coordination among scientific commu-
23 nities through the Network, have the potential
24 to help characterize baseline greenhouse gas

1 emission sources and sinks in the United States
2 and internationally.

3 (5) REGIONAL AND GLOBAL CLIMATE MOD-
4 ELING.—As part of the subprogram described in
5 paragraph (1), the Director, in collaboration with
6 the Office of Advanced Scientific Computing Re-
7 search described in section 606, shall carry out re-
8 search to develop, evaluate, and use high-resolution
9 regional and global climate and Earth models and
10 predictions to determine, and support efforts to re-
11 duce, the impacts of changing climate.

12 (6) INTEGRATED ASSESSMENT RESEARCH.—
13 The Director shall carry out research into options
14 for mitigation of and adaptation to climate change
15 through multiscale models of the entire climate sys-
16 tem. Such modeling shall include human processes
17 and greenhouse gas emissions, land use, and inter-
18 action among human and Earth systems.

19 (7) COORDINATION.—The Director shall coordi-
20 nate activities under this subsection with other Of-
21 fice of Science activities and with the United States
22 Global Change Research Program.

23 (d) USER FACILITIES AND ANCILLARY EQUIP-
24 MENT.—

1 (1) IN GENERAL.—The Director shall carry out
2 a program for the construction, operation, and main-
3 tenance of user facilities to support the program
4 under this section. As practicable, these facilities
5 shall serve the needs of the Department, industry,
6 the academic community, and other relevant entities.

7 (2) INCLUDED FUNCTIONS.—User facilities de-
8 scribed in paragraph (1) shall include facilities which
9 carry out—

10 (A) genome sequencing and analysis of
11 plants, microbes, and microbial communities
12 using high throughput tools, technologies, and
13 comparative analysis;

14 (B) molecular level research in biological
15 interactions, subsurface science, and the inter-
16 faces of natural and engineered materials; and

17 (C) measurement of cloud and aerosol
18 properties used for examining atmospheric proc-
19 esses and evaluating climate model perform-
20 ance, including ground stations at various loca-
21 tions, mobile resources, and aerial vehicles.

22 **SEC. 606. ADVANCED SCIENTIFIC COMPUTING RESEARCH**
23 **PROGRAM.**

24 (a) IN GENERAL.—As part of the activities author-
25 ized under section 603, the Director shall carry out a re-

1 search, development, demonstration, and commercial ap-
2 plication program to advance computational and net-
3 working capabilities to analyze, model, simulate, and pre-
4 dict complex phenomena relevant to the development of
5 new energy technologies and the competitiveness of the
6 United States.

7 (b) COORDINATION.—

8 (1) DIRECTOR.—The Director shall carry out
9 activities under this section in accordance with prior-
10 ities established by the Department's Under Sec-
11 retary for Science to determine and meet the com-
12 putational and networking research and facility
13 needs of the Office of Science and all other relevant
14 energy technology programs within the Department.

15 (2) UNDER SECRETARY FOR SCIENCE.—The
16 Department's Under Secretary for Science shall en-
17 sure the coordination of the activities of the Depart-
18 ment, including activities under this section, to de-
19 termine and meet the computational and networking
20 research and facility needs of the Office of Science
21 and all other relevant energy technology programs
22 within the Department.

23 (c) RESEARCH TO SUPPORT ENERGY APPLICA-
24 TIONS.—As part of the activities authorized under sub-
25 section (a), the program shall support research in high-

1 performance computing and networking relevant to energy
2 applications, including both basic and applied energy re-
3 search programs carried out by the Secretary.

4 (d) REPORTS.—

5 (1) ADVANCED COMPUTING FOR ENERGY APPLI-
6 CATIONS.—Not later than one year after the date of
7 enactment of this Act, the Secretary shall transmit
8 to the Congress a plan to integrate and leverage the
9 expertise and capabilities of the program described
10 in subsection (a), as well as other relevant computa-
11 tional and networking research programs and re-
12 sources supported by the Federal Government, to
13 advance the missions of the Department's applied
14 energy and energy efficiency programs.

15 (2) EXASCALE COMPUTING.—At least 18
16 months prior to the initiation of construction or in-
17 stallation of any exascale-class computing facility,
18 the Secretary shall transmit a plan to the Congress
19 detailing the proposed facility's cost projections and
20 capabilities to significantly accelerate the develop-
21 ment of new energy technologies.

22 (e) APPLIED MATHEMATICS AND SOFTWARE DEVEL-
23 OPMENT FOR HIGH-END COMPUTING SYSTEMS.—The Di-
24 rector shall carry out activities to develop, test, and sup-
25 port mathematics, models, and algorithms for complex

1 systems, as well as programming environments, tools, lan-
2 guages, and operating systems for high-end computing
3 systems (as defined in section 2 of the Department of En-
4 ergy High-End Computing Revitalization Act of 2004 (15
5 U.S.C. 5541)).

6 (f) HIGH-END COMPUTING FACILITIES.—The Direc-
7 tor shall—

8 (1) provide for sustained access by the public
9 and private research community in the United
10 States to high-end computing systems and to Lead-
11 ership Systems (as defined in section 2 of the De-
12 partment of Energy High-End Computing Revital-
13 ization Act of 2004 (15 U.S.C. 5541)), including
14 provision of technical support for users of such sys-
15 tems; and

16 (2) conduct research and development on next-
17 generation computing architectures and platforms to
18 support the missions of the Department.

19 (g) OUTREACH.—The Director shall conduct out-
20 reach programs and may form partnerships to increase the
21 use of and access to high-performance computing mod-
22 eling and simulation capabilities by industry, including
23 manufacturers.

1 **SEC. 607. FUSION ENERGY RESEARCH PROGRAM.**

2 (a) PROGRAM.—As part of the activities authorized
3 under section 603, the Director shall carry out a fusion
4 energy sciences research and development program to ef-
5 fectively address the scientific and engineering challenges
6 to building a cost-competitive fusion power plant and a
7 competitive fusion power industry in the United States.
8 As part of this program, the Director shall carry out re-
9 search activities to expand the fundamental understanding
10 of plasmas and matter at very high temperatures and den-
11 sities.

12 (b) ITER.—The Director shall coordinate and carry
13 out the responsibilities of the United States with respect
14 to the ITER international fusion project pursuant to the
15 Agreement on the Establishment of the ITER Inter-
16 national Fusion Energy Organization for the Joint Imple-
17 mentation of the ITER Project.

18 (c) IDENTIFICATION OF PRIORITIES.—Not later than
19 1 year after the date of enactment of this Act, the Sec-
20 retary shall transmit to the Congress a report on the De-
21 partment's proposed research and development activities
22 in magnetic fusion over the 10 years following the date
23 of enactment of this Act under four realistic budget sce-
24 narios. The report shall—

25 (1) identify specific areas of fusion energy de-
26 velopment in which the United States can and

1 should establish or solidify a lead in the global fu-
2 sion energy development effort; and

3 (2) identify priorities for initiation of facility
4 construction and facility decommissioning under
5 each of those scenarios.

6 (d) FUSION MATERIALS RESEARCH AND DEVELOP-
7 MENT.—The Director, in coordination with the Assistant
8 Secretary for Nuclear Energy of the Department, shall
9 carry out research and development activities to identify,
10 characterize, and create materials that can endure the
11 neutron, plasma, and heat fluxes expected in a commercial
12 fusion power plant. As part of the activities authorized
13 under subsection (c), the Secretary shall—

14 (1) provide an assessment of the need for a fa-
15 cility or facilities that can examine and test potential
16 fusion and next generation fission materials; and

17 (2) provide an assessment of whether a single
18 new facility that substantially addresses magnetic
19 fusion, inertial fusion, and next generation fission
20 materials research needs is feasible, in conjunction
21 with the expected capabilities of facilities operational
22 as of the date of enactment of this Act.

23 (e) FUSION SIMULATION PROJECT.—In collaboration
24 with the Office of Science’s Advanced Scientific Com-
25 puting Research program described in section 606, the Di-

1 rector shall carry out a computational project to advance
2 the capability of fusion researchers to accurately simulate
3 an entire fusion energy system.

4 (f) INERTIAL FUSION ENERGY RESEARCH AND DE-
5 VELOPMENT PROGRAM.—The Secretary shall carry out a
6 program of research and technology development in iner-
7 tial fusion for energy applications, including ion beam and
8 laser fusion. Not later than 180 days after the release of
9 a report from the National Academies on inertial fusion
10 energy research, the Secretary shall transmit to Congress
11 a report describing the Department's plan to incorporate
12 any relevant recommendations from the National Acad-
13 emies' report into this program.

14 **SEC. 608. HIGH ENERGY PHYSICS PROGRAM.**

15 (a) PROGRAM.—As part of the activities authorized
16 under section 603, the Director shall carry out a research
17 program on the elementary constituents of matter and en-
18 ergy and the nature of space and time.

19 (b) NEUTRINO RESEARCH.—As part of the program
20 described in subsection (a), the Director shall carry out
21 research activities on rare decay processes and the nature
22 of the neutrino, which may—

23 (1) include collaborations with the National
24 Science Foundation on relevant projects; and

1 (2) utilize components of existing accelerator
2 facilities to produce neutrino beams of sufficient in-
3 tensity to explore research priorities identified by the
4 High Energy Physics Advisory Panel or the National
5 Academy of Sciences.

6 (c) DARK ENERGY AND DARK MATTER RE-
7 SEARCH.—As part of the program described in subsection
8 (a), the Director shall carry out research activities on the
9 nature of dark energy and dark matter. These activities
10 shall be consistent with research priorities identified by
11 the High Energy Physics Advisory Panel or the National
12 Academy of Sciences, and may include—

13 (1) the development of space-based and land-
14 based facilities and experiments; and

15 (2) collaborations with the National Aeronautics
16 and Space Administration, the National Science
17 Foundation, or international collaborations on rel-
18 evant research projects.

19 (d) ACCELERATOR RESEARCH AND DEVELOP-
20 MENT.—The Director shall carry out research and devel-
21 opment in advanced accelerator concepts and technologies
22 to reduce the necessary scope and cost for the next genera-
23 tion of particle accelerators.

24 (e) INTERNATIONAL COLLABORATION.—The Direc-
25 tor, as practicable and in coordination with other appro-

1 priate Federal agencies as necessary, shall maximize the
2 access of United States researchers to the most advanced
3 accelerator facilities and research capabilities in the world,
4 including the Large Hadron Collider.

5 **SEC. 609. NUCLEAR PHYSICS PROGRAM.**

6 (a) PROGRAM.—As part of the activities authorized
7 under section 603, the Director shall carry out a research
8 program, and support relevant facilities, to discover and
9 understand various forms of nuclear matter.

10 (b) FACILITY CONSTRUCTION AND UPGRADES.—
11 Consistent with the Office of Science’s project manage-
12 ment practices, the Director shall carry out—

13 (1) an upgrade of the Continuous Electron
14 Beam Accelerator Facility to a 12 gigaelectronvolt
15 beam of electrons; and

16 (2) construction of the Facility for Rare Isotope
17 Beams.

18 (c) ISOTOPE DEVELOPMENT AND PRODUCTION FOR
19 RESEARCH APPLICATIONS.—The Director shall carry out
20 a program for the production of isotopes, including the
21 development of techniques to produce isotopes, that the
22 Secretary determines are needed for research or other pur-
23 poses. In making this determination, the Secretary shall
24 consider any relevant recommendations made by Federal
25 advisory committees, the National Academies, and inter-

1 agency working groups in which the Department partici-
2 pates.

3 **SEC. 610. SCIENCE LABORATORIES INFRASTRUCTURE PRO-**
4 **GRAM.**

5 (a) PROGRAM.—The Director shall carry out a pro-
6 gram to improve the safety, efficiency, and mission readi-
7 ness of infrastructure at Office of Science laboratories.

8 The program shall include projects to—

9 (1) renovate or replace space that does not
10 meet research needs;

11 (2) replace facilities that are no longer cost ef-
12 fective to renovate or operate;

13 (3) modernize utility systems to prevent failures
14 and ensure efficiency;

15 (4) remove excess facilities to allow safe and ef-
16 ficient operations; and

17 (5) construct modern facilities to conduct ad-
18 vanced research in controlled environmental condi-
19 tions.

20 (b) MINOR CONSTRUCTION PROJECTS.—

21 (1) AUTHORITY.—Using operation and mainte-
22 nance funds or facilities and infrastructure funds
23 authorized by law, the Secretary may carry out
24 minor construction projects with respect to labora-
25 tories administered by the Office of Science.

1 (2) ANNUAL REPORT.—The Secretary shall
2 submit to Congress, as part of the annual budget
3 submission of the Department, a report on each ex-
4 ercise of the authority under subsection (a) during
5 the preceding fiscal year. Each report shall include
6 a summary of maintenance and infrastructure needs
7 and associated funding requirements at each of the
8 laboratories, including the amount of both planned
9 and deferred infrastructure spending at each labora-
10 tory. Each report shall provide a brief description of
11 each minor construction project covered by the re-
12 port.

13 (3) COST VARIATION REPORTS.—If, at any time
14 during the construction of any minor construction
15 project, the estimated cost of the project is revised
16 and the revised cost of the project exceeds the minor
17 construction threshold, the Secretary shall imme-
18 diately submit to Congress a report explaining the
19 reasons for the cost variation.

20 (4) DEFINITIONS.—In this section—

21 (A) the term “minor construction project”
22 means any plant project not specifically author-
23 ized by law for which the approved total esti-
24 mated cost does not exceed the minor construc-
25 tion threshold; and

1 (B) the term “minor construction thresh-
2 old” means \$10,000,000, with such amount to
3 be adjusted by the Secretary in accordance with
4 the Engineering News-Record Construction
5 Cost Index, or an appropriate alternative index
6 as determined by the Secretary, once every five
7 years after the date of enactment of this Act.

8 (5) NONAPPLICABILITY.—Sections 4703 and
9 4704 of the Atomic Energy Defense Act (50 U.S.C.
10 2743 and 2744) shall not apply to laboratories ad-
11 ministered by the Office of Science.

12 **SEC. 611. AUTHORIZATION OF APPROPRIATIONS.**

13 There are authorized to be appropriated to the Sec-
14 retary for the activities of the Office of Science—

15 (1) \$6,221,000,000 for fiscal year 2011, of
16 which—

17 (A) \$2,020,000,000 shall be for Basic En-
18 ergy Sciences activities under section 604;

19 (B) \$700,000,000 shall be for Biological
20 and Environmental Research activities under
21 section 605; and

22 (C) \$469,000,000 shall be for Advanced
23 Scientific Computing Research activities under
24 section 606;

1 (2) \$6,656,000,000 for fiscal year 2012, of
2 which—

3 (A) \$2,220,000,000 shall be for Basic En-
4 ergy Sciences activities under section 604;

5 (B) \$791,000,000 shall be for Biological
6 and Environmental Research activities under
7 section 605; and

8 (C) \$515,000,000 shall be for Advanced
9 Scientific Computing Research activities under
10 section 606;

11 (3) \$7,122,000,000 for fiscal year 2013, of
12 which—

13 (A) \$2,440,000,000 shall be for Basic En-
14 ergy Sciences activities under section 604;

15 (B) \$894,000,000 shall be for Biological
16 and Environmental Research activities under
17 section 605; and

18 (C) \$567,000,000 shall be for Advanced
19 Scientific Computing Research activities under
20 section 606;

21 (4) \$7,621,000,000 for fiscal year 2014, of
22 which—

23 (A) \$2,690,000,000 shall be for Basic En-
24 ergy Sciences activities under section 604;

1 (B) \$957,000,000 shall be for Biological
2 and Environmental Research activities under
3 section 605; and

4 (C) \$624,000,000 shall be for Advanced
5 Scientific Computing Research activities under
6 section 606; and

7 (5) \$8,154,000,000 for fiscal year 2015, of
8 which—

9 (A) \$2,960,000,000 shall be for Basic En-
10 ergy Sciences activities under section 604;

11 (B) \$1,060,000,000 shall be for Biological
12 and Environmental Research activities under
13 section 605; and

14 (C) \$686,000,000 shall be for Advanced
15 Scientific Computing Research activities under
16 section 606.

17 **Subtitle B—Advanced Research**
18 **Projects Agency—Energy**

19 **SEC. 621. SHORT TITLE.**

20 This subtitle may be cited as the “ARPA–E Reau-
21 thorization Act of 2010”.

22 **SEC. 622. ARPA–E AMENDMENTS.**

23 Section 5012 of the America COMPETES Act (42
24 U.S.C. 16538) is amended—

25 (1) in subsection (c)(2)—

1 (A) in subparagraph (A), by inserting
2 “and applied” after “advances in fundamental”;

3 (B) by striking “and” at the end of sub-
4 paragraph (B);

5 (C) by striking the period at the end of
6 subparagraph (C) and inserting “; and”; and

7 (D) by adding at the end the following new
8 subparagraph:

9 “(D) promoting the commercial application
10 of advanced energy technologies.”;

11 (2) in subsection (e)(3), by amending subpara-
12 graph (C) to read as follows:

13 “(C) research and development of ad-
14 vanced manufacturing process and technologies
15 for the domestic manufacturing of novel energy
16 technologies; and”;

17 (3) by redesignating subsections (f) through
18 (m) as subsections (g), (h), (i), (j), (l), (m), (n), and
19 (o), respectively;

20 (4) by inserting after subsection (e) the fol-
21 lowing new subsection:

22 “(f) AWARDS.—In carrying out this section, the Di-
23 rector shall initiate and execute awards in the form of
24 grants, contracts, cooperative agreements, cash prizes,
25 and other transactions.”;

1 (5) in subsection (g), as so redesignated by
2 paragraph (3) of this section—

3 (A) by redesignating paragraphs (1) and
4 (2) as paragraphs (2) and (3), respectively;

5 (B) by inserting before paragraph (2), as
6 so redesignated by subparagraph (A) of this
7 paragraph, the following new paragraph:

8 “(1) IN GENERAL.—The Director shall establish
9 and maintain within ARPA–E a staff, including
10 legal counsel, contracting personnel, and program di-
11 rectors, with sufficient qualifications and expertise
12 to enable ARPA–E to carry out its responsibilities
13 under this section separate and distinct from the op-
14 erations of the rest of the Department.”;

15 (C) in paragraph (2)(A), as so redesi-
16 gated by subparagraph (A) of this paragraph,
17 by striking “each of”;

18 (D) in paragraph (2)(B), as so redesi-
19 gated by subparagraph (A) of this paragraph—

20 (i) in clause (iv), by striking “, with
21 advice under subsection (j) as appro-
22 priate,”;

23 (ii) by redesignating clauses (v) and
24 (vi) as clauses (vi) and (viii), respectively;

1 (iii) by inserting after clause (iv) the
2 following new clause:

3 “(v) identifying innovative cost-shar-
4 ing arrangements for ARPA-E projects,
5 including through use of the authority
6 under section 988(b)(3) of the Energy Pol-
7 icy Act of 2005 (42 U.S.C. 16352(b)(3));”;

8 (iv) in clause (vi), as so redesignated
9 by clause (ii) of this subparagraph, by
10 striking “; and” and inserting a semicolon;
11 and

12 (v) by inserting after clause (vi), as so
13 redesignated by clause (ii) of this subpara-
14 graph, the following new clause:

15 “(vii) identifying mechanisms for com-
16 mercial application of successful energy
17 technology development projects, including
18 through establishment of partnerships be-
19 tween awardees and commercial entities;
20 and”;

21 (E) in paragraph (2)(C), as so redesign-
22 ated by subparagraph (A) of this paragraph,
23 by inserting “up to” after “shall be”;

24 (F) in paragraph (3), as so redesignated
25 by subparagraph (A) of this paragraph, by

1 striking subparagraph (B) and redesignating
2 subparagraphs (C) and (D) as subparagraphs
3 (B) and (C), respectively;

4 (G) by striking “program managers” each
5 place it appears and inserting “program direc-
6 tors”;

7 (H) by striking “program manager” each
8 place it appears and inserting “program direc-
9 tor”; and

10 (I) by adding at the end the following new
11 paragraph:

12 “(4) FELLOWSHIPS.—The Director is author-
13 ized to select exceptional early-career and senior sci-
14 entific, legal, business, and technical personnel to
15 serve as fellows to work at ARPA-E for terms not
16 to exceed two years. Responsibilities of fellows may
17 include—

18 “(A) supporting program managers in pro-
19 gram creation, design, implementation, and
20 management;

21 “(B) exploring technical fields for future
22 ARPA-E program areas;

23 “(C) assisting the Director in the creation
24 of the strategic vision for ARPA-E referred to
25 in subsection (h)(2);

1 “(D) preparing energy technology and eco-
2 nomic analyses; and

3 “(E) any other appropriate responsibilities
4 identified by the Director.”;

5 (6) in subsection (h)(2), as so redesignated by
6 paragraph (3) of this section—

7 (A) by striking “2008” and inserting
8 “2010”; and

9 (B) by striking “2011” and inserting
10 “2013”;

11 (7) by amending subsection (j), as so redesign-
12 ated by paragraph (3) of this section, to read as
13 follows:

14 “(j) FEDERAL DEMONSTRATION OF TECH-
15 NOLOGIES.—The Director shall seek opportunities to part-
16 ner with purchasing and procurement programs of Federal
17 agencies to demonstrate energy technologies resulting
18 from activities funded through ARPA-E.”;

19 (8) by inserting after such subsection (j) the
20 following new subsection:

21 “(k) EVENTS.—The Director is authorized to con-
22 vene, organize, and sponsor events that further the objec-
23 tives of ARPA-E, including events that assemble award-
24 ees, the most promising applicants for ARPA-E funding,
25 and a broad range of ARPA-E stakeholders (which may

1 include members of relevant scientific research and aca-
2 demic communities, government officials, financial institu-
3 tions, private investors, entrepreneurs, and other private
4 entities), for the purposes of—

5 “(1) demonstrating projects of ARPA–E award-
6 ees;

7 “(2) demonstrating projects of finalists for
8 ARPA–E awards and other energy technology
9 projects;

10 “(3) facilitating discussion of the commercial
11 application of energy technologies developed under
12 ARPA–E and other government-sponsored research
13 and development programs; or

14 “(4) such other purposes as the Director con-
15 siders appropriate.”;

16 (9) in subsection (m)(1), as so redesignated by
17 paragraph (3) of this section, by striking “4 years”
18 and inserting “6 years”;

19 (10) in subsection (m)(2)(B), as so redesign-
20 ated by paragraph (3) of this section, by inserting
21 “, and how those lessons may apply to the operation
22 of other programs within the Department of En-
23 ergy” after “ARPA–E”;

1 (11) by amending subsection (o)(2), as so re-
2 designated by paragraph (3) of this section, to read
3 as follows:

4 “(2) AUTHORIZATION OF APPROPRIATIONS.—
5 Subject to paragraph (4), there are authorized to be
6 appropriated to the Director for deposit in the
7 Fund, without fiscal year limitation—

8 “(A) \$300,000,000 for fiscal year 2011;
9 “(B) \$500,000,000 for fiscal year 2012;
10 “(C) \$700,000,000 for fiscal year 2013;
11 “(D) \$900,000,000 for fiscal year 2014;
12 “(E) \$1,000,000,000 for fiscal year 2015;

13 and

14 “(F) such sums as are necessary for each
15 of fiscal years 2016 through 2020.”;

16 (12) in subsection (o), as so redesignated by
17 paragraph (3) of this section, by—

18 (A) striking paragraph (4); and

19 (B) redesignated paragraph (5) as para-
20 graph (4); and

21 (13) in subsection (o)(4)(B), as so redesignated
22 by paragraphs (3) and (12)(B) of this subsection—

23 (A) by striking “2.5 percent” and inserting
24 “5 percent”; and

1 (B) by inserting “, consistent with the goal
2 described in subsection (c)(2)(D) and within the
3 responsibilities of program directors as specified
4 in subsection (g)(2)(B)(vii)” after “outreach ac-
5 tivities”.

6 **Subtitle C—Energy Innovation**
7 **Hubs**

8 **SEC. 631. SHORT TITLE.**

9 This subtitle may be cited as the “Energy Innovation
10 Hubs Authorization Act of 2010”.

11 **SEC. 632. ENERGY INNOVATION HUBS.**

12 (a) ESTABLISHMENT OF PROGRAM.—

13 (1) IN GENERAL.—The Secretary of Energy
14 shall carry out a program to enhance the Nation’s
15 economic, environmental, and energy security by
16 making grants to consortia for establishing and op-
17 erating Energy Innovation Hubs to conduct and
18 support, whenever practicable at one centralized lo-
19 cation, multidisciplinary, collaborative research, de-
20 velopment, demonstration, and commercial applica-
21 tion of advanced energy technologies in areas not
22 being served by the private sector.

23 (2) TECHNOLOGY DEVELOPMENT FOCUS.—The
24 Secretary shall designate for each Hub a unique ad-
25 vanced energy technology development focus.

1 (3) COORDINATION.—The Secretary shall en-
2 sure the coordination of, and avoid unnecessary du-
3 plication of, the activities of Hubs with those of
4 other Department of Energy research entities, in-
5 cluding the National Laboratories, the Advanced Re-
6 search Projects Agency—Energy, and Energy Fron-
7 tier Research Centers, and within industry. Such co-
8 ordination shall include convening and consulting
9 with representatives of staff of the Department of
10 Energy, representatives from Hubs and the quali-
11 fying entities that are members of the consortia op-
12 erating the Hubs, and representatives of such other
13 entities as the Secretary considers appropriate, to
14 share research results, program plans, and opportu-
15 nities for collaboration.

16 (4) ADMINISTRATION.—The Secretary shall ad-
17 minister this section with respect to each Hub
18 through the Department program office appropriate
19 to administer the subject matter of the technology
20 development focus assigned under paragraph (2) for
21 the Hub.

22 (b) CONSORTIA.—

23 (1) ELIGIBILITY.—To be eligible to receive a
24 grant under this section for the establishment and
25 operation of a Hub, a consortium shall—

- 1 (A) be composed of no fewer than 2 quali-
2 fying entities;
- 3 (B) operate subject to a binding agreement
4 entered into by its members that documents—
- 5 (i) the proposed partnership agree-
6 ment, including the governance and man-
7 agement structure of the Hub;
- 8 (ii) measures to enable cost-effective
9 implementation of the program under this
10 section;
- 11 (iii) a proposed budget, including fi-
12 nancial contributions from non-Federal
13 sources;
- 14 (iv) conflict of interest procedures
15 consistent with subsection (d)(3), all
16 known material conflicts of interest, and
17 corresponding mitigation plans;
- 18 (v) an accounting structure that en-
19 ables the Secretary to ensure that the con-
20 sortium has complied with the require-
21 ments of this section; and
- 22 (vi) an external advisory committee
23 consistent with subsection (d)(2); and
- 24 (C) operate as a nonprofit organization.

1 (2) APPLICATION.—A consortium seeking to es-
2 tablish and operate a Hub under this section, acting
3 through a prime applicant, shall transmit to the Sec-
4 retary an application at such time, in such form,
5 and accompanied by such information as the Sec-
6 retary shall require, including a detailed description
7 of the elements of the consortium agreement re-
8 quired under paragraph (1)(B).

9 (c) SELECTION AND SCHEDULE.—The Secretary
10 shall select consortia for grants for the establishment and
11 operation of Hubs through competitive selection processes.
12 Grants made to a Hub shall be for a period not to exceed
13 5 years, after which the grant may be renewed, subject
14 to a competitive selection process.

15 (d) HUB OPERATIONS.—

16 (1) IN GENERAL.—Hubs shall conduct or pro-
17 vide for multidisciplinary, collaborative research, de-
18 velopment, demonstration, and commercial applica-
19 tion of advanced energy technologies within the tech-
20 nology development focus designated for the Hub by
21 the Secretary under subsection (a)(2). Each Hub
22 shall—

23 (A) encourage collaboration and commu-
24 nication among the member qualifying entities
25 of the consortium and awardees by conducting

1 activities whenever practicable at one central-
2 ized location;

3 (B) develop and publish on the Depart-
4 ment of Energy's Web site proposed plans and
5 programs;

6 (C) submit an annual report to the Sec-
7 retary summarizing the Hub's activities, includ-
8 ing detailing organizational expenditures, listing
9 external advisory committee members, and de-
10 scribing each project undertaken by the Hub;
11 and

12 (D) monitor project implementation and
13 coordination.

14 (2) EXTERNAL ADVISORY COMMITTEE.—Each
15 Hub shall establish an external advisory committee,
16 the membership of which shall have sufficient exper-
17 tise to advise and provide guidance on scientific,
18 technical, industry, financial, and research manage-
19 ment matters.

20 (3) CONFLICTS OF INTEREST.—

21 (A) PROCEDURES.—Hubs shall establish
22 conflict of interest procedures, consistent with
23 those of the Department of Energy, to ensure
24 that employees and consortia designees for Hub
25 activities who are in decisionmaking capacities

1 disclose all material conflicts of interest, includ-
2 ing financial, organizational, and personal con-
3 flicts of interest.

4 (B) DISQUALIFICATION AND REVOCATION.—The Secretary may disqualify an appli-
5 cation or revoke funds distributed to a Hub if
6 the Secretary discovers a failure to comply with
7 conflict of interest procedures established under
8 subparagraph (A).
9

10 (e) PROHIBITION ON CONSTRUCTION.—No funds
11 provided pursuant to this section may be used for con-
12 struction of new buildings or facilities for Hubs. Construc-
13 tion of new buildings or facilities shall not be considered
14 as part of the non-Federal share of a Hub cost-sharing
15 agreement.

16 (f) OVERSIGHT BOARD.—The Secretary shall estab-
17 lish and maintain within the Department an Oversight
18 Board to oversee the progress of Hubs.

19 (g) DEFINITIONS.—For purposes of this section:

20 (1) ADVANCED ENERGY TECHNOLOGY.—The
21 term “advanced energy technology” means an inno-
22 vative technology—

23 (A) that produces energy from solar, wind,
24 geothermal, biomass, tidal, wave, ocean, or
25 other renewable energy resources;

1 (B) that produces nuclear energy;

2 (C) for carbon capture and sequestra

3 or

4 (D) that generates, transmits, distribu
5 utilizes, or stores energy more efficiently
6 conventional technologies.

7 (2) HUB.—The term “Hub” means an En
8 Innovation Hub established in accordance with
9 section.

10 (3) INSTITUTION OF HIGHER EDUCATION.—
11 term “institution of higher education” has
12 meaning given that term in section 101(a) of
13 Higher Education Act of 1965 (20 U.S.C. 1001

14 (4) QUALIFYING ENTITY.—The term “q
15 ualifying entity” means—

16 (A) an institution of higher education;

17 (B) an appropriate State or Federal en

18 (C) a nongovernmental organization
19 expertise in advanced energy technology
20 search, development, demonstration, or c
21 mercial application; or

22 (D) any other relevant entity the Secre
23 considers appropriate.

24 (5) SECRETARY.—The term “Secretary” m
25 the Secretary of Energy.

1 (h) AUTHORIZATION OF APPROPRIATIONS.—There
2 are authorized to be appropriated to the Secretary to carry
3 out this section—

4 (1) \$110,000,000 for fiscal year 2011;

5 (2) \$135,000,000 for fiscal year 2012;

6 (3) \$195,000,000 for fiscal year 2013;

7 (4) \$210,000,000 for fiscal year 2014; and

8 (5) \$210,000,000 for fiscal year 2015.

○

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**AMENDMENT IN THE NATURE OF A SUBSTITUTE
OFFERED BY MR. GORDON OF TENNESSEE**

Strike all after the enacting clause and insert the following:

1 SECTION 1. SHORT TITLE; TABLE OF CONTENTS.

2 (a) **SHORT TITLE.**—This Act may be cited as th
3 “America COMPETES Reauthorization Act of 2010”.

4 (b) **TABLE OF CONTENTS.**—The table of contents fo
5 this Act is as follows:

Sec. 1. Short title; table of contents.

TITLE I—SCIENCE AND TECHNOLOGY POLICY

Subtitle A—National Nanotechnology Initiative Amendments

Sec. 101. Short title.
Sec. 102. National nanotechnology program amendments.
Sec. 103. Societal dimensions of nanotechnology.
Sec. 104. Technology transfer.
Sec. 105. Research in areas of national importance.
Sec. 106. Nanomanufacturing research.
Sec. 107. Definitions.

Subtitle B—Networking and Information Technology Research and
Development

Sec. 111. Short title.
Sec. 112. Program planning and coordination.
Sec. 113. Large-scale research in areas of national importance.
Sec. 114. Cyber-physical systems and information management.
Sec. 115. National Coordination Office.
Sec. 116. Improving networking and information technology education.
Sec. 117. Conforming and technical amendments.

Subtitle C—Other OSTP Provisions

Sec. 121. Federal scientific collections.
Sec. 122. Coordination of manufacturing research and development.
Sec. 123. Interagency public access committee.

TITLE II—NATIONAL SCIENCE FOUNDATION

Sec. 201. Short title.

Subtitle A—General Provisions

Sec. 211. Definitions.

Sec. 212. Authorization of appropriations.

Sec. 213. National Science Board administrative amendments.

Sec. 214. Broader impacts review criterion.

Sec. 215. National Center for Science and Engineering Statistics.

Subtitle B—Research and Innovation

Sec. 221. Support for potentially transformative research.

Sec. 222. Facilitating interdisciplinary collaborations for national needs.

Sec. 223. National Science Foundation manufacturing research.

Sec. 224. Strengthening institutional research partnerships.

Sec. 225. National Science Board report on mid-scale instrumentation.

Sec. 226. Sense of Congress on overall support for research infrastructure at the Foundation.

Sec. 227. Partnerships for innovation.

Sec. 228. Prize awards.

Subtitle C—STEM Education and Workforce Training

Sec. 241. Graduate student support.

Sec. 242. Postdoctoral fellowship in STEM education research.

Sec. 243. Robert Noyce teacher scholarship program.

Sec. 244. Institutions serving persons with disabilities.

Sec. 245. Institutional integration.

Sec. 246. Postdoctoral research fellowships.

Sec. 247. Broadening participation training and outreach.

Sec. 248. Transforming undergraduate education in STEM.

Sec. 249. 21st century graduate education.

Sec. 250. Undergraduate broadening participation program.

Sec. 251. Grand challenges in education research.

Sec. 252. Research experiences for undergraduates.

Sec. 253. Laboratory science pilot program.

TITLE III—STEM EDUCATION

Sec. 301. Coordination of Federal STEM education.

Sec. 302. Advisory committee on STEM education.

Sec. 303. STEM education at the Department of Energy.

TITLE IV—NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY

Sec. 401. Short title.

Sec. 402. Authorization of appropriations.

Sec. 403. Under Secretary of Commerce for Standards and Technology.

Sec. 404. Reorganization of NIST laboratories.

Sec. 405. Federal Government standards and conformity assessment coordination.

Sec. 406. Manufacturing extension partnership.

Sec. 407. Bioscience research program.

Sec. 408. Emergency communication and tracking technologies research initiative.

- Sec. 409. TIP Advisory Board.
- Sec. 410. Underrepresented minorities.
- Sec. 411. Cyber security standards and guidelines.
- Sec. 412. Definitions.

TITLE V—INNOVATION

- Sec. 501. Office of Innovation and Entrepreneurship.
- Sec. 502. Federal loan guarantees for innovative technologies in manufacturing.
- Sec. 503. Regional innovation program.

TITLE VI—DEPARTMENT OF ENERGY

Subtitle A—Office of Science

- Sec. 601. Short title.
- Sec. 602. Definitions.
- Sec. 603. Mission of the Office of Science.
- Sec. 604. Basic Energy Sciences Program.
- Sec. 605. Biological and Environmental Research Program.
- Sec. 606. Advanced Scientific Computing Research Program.
- Sec. 607. Fusion energy research program.
- Sec. 608. High Energy Physics Program.
- Sec. 609. Nuclear Physics Program.
- Sec. 610. Science Laboratories Infrastructure Program.
- Sec. 611. Authorization of appropriations.

Subtitle B—Advanced Research Projects Agency-Energy

- Sec. 621. Short title.
- Sec. 622. ARPA-E amendments.

Subtitle C—Energy Innovation Hubs

- Sec. 631. Short title.
- Sec. 632. Energy Innovation Hubs.

1 **TITLE I—SCIENCE AND**
 2 **TECHNOLOGY POLICY**
 3 **Subtitle A—National Nanotechnol-**
 4 **ogy Initiative Amendments**

5 **SEC. 101. SHORT TITLE.**

6 This subtitle may be cited as the “National Nano-
 7 technology Initiative Amendments Act of 2010”.

1 **SEC. 102. NATIONAL NANOTECHNOLOGY PROGRAM AMEND-**
2 **MENTS.**

3 The 21st Century Nanotechnology Research and De-
4 velopment Act (15 U.S.C. 7501 et seq.) is amended—

5 (1) by striking section 2(c)(4) and inserting the
6 following new paragraph:

7 “(4) develop, within 12 months after the date
8 of enactment of the National Nanotechnology Initia-
9 tive Amendments Act of 2010, and update every 3
10 years thereafter, a strategic plan to guide the activi-
11 ties described under subsection (b) that specifies
12 near-term and long-term objectives for the Program,
13 the anticipated time frame for achieving the near-
14 term objectives, and the metrics to be used for as-
15 sessing progress toward the objectives, and that de-
16 scribes—

17 “(A) how the Program will move results
18 out of the laboratory and into applications for
19 the benefit of society, including through co-
20 operation and collaborations with nanotechnol-
21 ogy research, development, and technology tran-
22 sition initiatives supported by the States;

23 “(B) how the Program will encourage and
24 support interdisciplinary research and develop-
25 ment in nanotechnology; and

1 “(C) proposed research in areas of national
2 importance in accordance with the requirements
3 of section 105 of the National Nanotechnology
4 Initiative Amendments Act of 2010;”;

5 (2) in section 2—

6 (A) in subsection (d)—

7 (i) by redesignating paragraphs (1)
8 through (5) as paragraphs (2) through (6),
9 respectively; and

10 (ii) by inserting the following new
11 paragraph before paragraph (2), as so re-
12 designated by clause (i) of this subpara-
13 graph:

14 “(1) the Program budget, for the previous fiscal
15 year, for each agency that participates in the Pro-
16 gram, including a breakout of spending for the de-
17 velopment and acquisition of research facilities and
18 instrumentation, for each program component area,
19 and for all activities pursuant to subsection
20 (b)(10);”;

21 (B) by inserting at the end the following
22 new subsection:

23 “(e) STANDARDS SETTING.—The agencies partici-
24 pating in the Program shall support the activities of com-
25 mittees involved in the development of standards for nano-

1 technology and may reimburse the travel costs of scientists
2 and engineers who participate in activities of such commit-
3 tees.”;

4 (3) by striking section 3(b) and inserting the
5 following new subsection:

6 “(b) FUNDING.—(1) The operation of the National
7 Nanotechnology Coordination Office shall be supported by
8 funds from each agency participating in the Program. The
9 portion of such Office’s total budget provided by each
10 agency for each fiscal year shall be in the same proportion
11 as the agency’s share of the total budget for the Program
12 for the previous fiscal year, as specified in the report re-
13 quired under section 2(d)(1).

14 “(2) The annual report under section 2(d) shall in-
15 clude—

16 “(A) a description of the funding required by
17 the National Nanotechnology Coordination Office to
18 perform the functions specified under subsection (a)
19 for the next fiscal year by category of activity, in-
20 cluding the funding required to carry out the re-
21 quirements of section 2(b)(10)(D), subsection (d) of
22 this section, and section 5;

23 “(B) a description of the funding required by
24 such Office to perform the functions specified under
25 subsection (a) for the current fiscal year by category

1 of activity, including the funding required to carry
2 out the requirements of subsection (d); and

3 “(C) the amount of funding provided for such
4 Office for the current fiscal year by each agency par-
5 ticipating in the Program.”;

6 (4) by inserting at the end of section 3 the fol-
7 lowing new subsection:

8 “(d) PUBLIC INFORMATION.—(1) The National
9 Nanotechnology Coordination Office shall develop and
10 maintain a database accessible by the public of projects
11 funded under the Environmental, Health, and Safety, the
12 Education and Societal Dimensions, and the Nanomanu-
13 facturing program component areas, or any successor pro-
14 gram component areas, including a description of each
15 project, its source of funding by agency, and its funding
16 history. For the Environmental, Health, and Safety pro-
17 gram component area, or any successor program compo-
18 nent area, projects shall be grouped by major objective as
19 defined by the research plan required under section 103(b)
20 of the National Nanotechnology Initiative Amendments
21 Act of 2010. For the Education and Societal Dimensions
22 program component area, or any successor program com-
23 ponent area, the projects shall be grouped in subcategories
24 of—

25 “(A) education in formal settings;

1 “(B) education in informal settings;

2 “(C) public outreach; and

3 “(D) ethical, legal, and other societal issues.

4 “(2) The National Nanotechnology Coordination Of-
5 fice shall develop, maintain, and publicize information on
6 nanotechnology facilities supported under the Program,
7 and may include information on nanotechnology facilities
8 supported by the States, that are accessible for use by in-
9 dividuals from academic institutions and from industry.
10 The information shall include at a minimum the terms and
11 conditions for the use of each facility, a description of the
12 capabilities of the instruments and equipment available for
13 use at the facility, and a description of the technical sup-
14 port available to assist users of the facility.”;

15 (5) in section 4(a)—

16 (A) by striking “or designate”;

17 (B) by inserting “as a distinct entity”
18 after “Advisory Panel”; and

19 (C) by inserting at the end “The Advisory
20 Panel shall form a subpanel with membership
21 having specific qualifications tailored to enable
22 it to carry out the requirements of subsection
23 (e)(7).”;

24 (6) in section 4(b)—

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1 (A) by striking “or designated” and “or
2 designating”; and

3 (B) by adding at the end the following:
4 “At least one member of the Advisory Panel
5 shall be an individual employed by and rep-
6 resenting a minority-serving institution.”;

7 (7) by amending section 5 to read as follows:

8 **“SEC. 5. TRIENNIAL EXTERNAL REVIEW OF THE NATIONAL
9 NANOTECHNOLOGY PROGRAM.**

10 “(a) IN GENERAL.—The Director of the National
11 Nanotechnology Coordination Office shall enter into an ar-
12 rangement with the National Research Council of the Na-
13 tional Academy of Sciences to conduct a triennial review
14 of the Program. The Director shall ensure that the ar-
15 rangement with the National Research Council is con-
16 cluded in order to allow sufficient time for the reporting
17 requirements of subsection (b) to be satisfied. Each tri-
18 ennial review shall include an evaluation of the—

19 “(1) research priorities and technical content of
20 the Program, including whether the allocation of
21 funding among program component areas, as des-
22 ignated according to section 2(c)(2), is appropriate;

23 “(2) effectiveness of the Program’s manage-
24 ment and coordination across agencies and dis-

1 ciplines, including an assessment of the effectiveness
2 of the National Nanotechnology Coordination Office

3 “(3) Program’s scientific and technological ac-
4 complishments and its success in transferring tech-
5 nology to the private sector; and

6 “(4) adequacy of the Program’s activities ad-
7 dressing ethical, legal, environmental, and other ap-
8 propriate societal concerns, including human health
9 concerns.

10 “(b) EVALUATION TO BE TRANSMITTED TO CON-
11 GRESS.—The National Research Council shall document
12 the results of each triennial review carried out in accord-
13 ance with subsection (a) in a report that includes any rec-
14 ommendations for ways to improve the Program’s man-
15 agement and coordination processes and for changes to
16 the Program’s objectives, funding priorities, and technical
17 content. Each report shall be submitted to the Director
18 of the National Nanotechnology Coordination Office, who
19 shall transmit it to the Advisory Panel, the Committee on
20 Commerce, Science, and Transportation of the Senate
21 and the Committee on Science and Technology of the
22 House of Representatives not later than September 30 of
23 every third year, with the first report due September 30
24 2010.

1 “(c) FUNDING.—Of the amounts provided in accord-
2 ance with section 3(b)(1), the following amounts shall be
3 available to carry out this section:

4 “(1) \$500,000 for fiscal year 2010.

5 “(2) \$500,000 for fiscal year 2011.

6 “(3) \$500,000 for fiscal year 2012.”; and

7 (8) in section 10—

8 (A) by amending paragraph (2) to read as
9 follows:

10 “(2) NANOTECHNOLOGY.—The term ‘nanotech-
11 nology’ means the science and technology that will
12 enable one to understand, measure, manipulate, and
13 manufacture at the nanoscale, aimed at creating ma-
14 terials, devices, and systems with fundamentally new
15 properties or functions.”; and

16 (B) by adding at the end the following new
17 paragraph:

18 “(7) NANOSCALE.—The term ‘nanoscale’ means
19 one or more dimensions of between approximately 1
20 and 100 nanometers.”.

21 **SEC. 103. SOCIETAL DIMENSIONS OF NANOTECHNOLOGY.**

22 (a) COORDINATOR FOR SOCIETAL DIMENSIONS OF
23 NANOTECHNOLOGY.—The Director of the Office of
24 Science and Technology Policy shall designate an associate
25 director of the Office of Science and Technology Policy

1 as the Coordinator for Societal Dimensions of Nanotech-
2 nology. The Coordinator shall be responsible for oversight
3 of the coordination, planning, and budget prioritization of
4 activities required by section 2(b)(10) of the 21st Century
5 Nanotechnology Research and Development Act (15
6 U.S.C. 7501(b)(10)). The Coordinator shall, with the as-
7 sistance of appropriate senior officials of the agencies
8 funding activities within the Environmental, Health, and
9 Safety and the Education and Societal Dimensions pro-
10 gram component areas of the Program, or any successor
11 program component areas, ensure that the requirements
12 of such section 2(b)(10) are satisfied. The responsibilities
13 of the Coordinator shall include—

14 (1) ensuring that a research plan for the envi-
15 ronmental, health, and safety research activities re-
16 quired under subsection (b) is developed, updated,
17 and implemented and that the plan is responsive to
18 the recommendations of the subpanel of the Advi-
19 sory Panel established under section 4(a) of the 21st
20 Century Nanotechnology Research and Development
21 Act (15 U.S.C. 7503(a)), as amended by this sub-
22 title;

23 (2) encouraging and monitoring the efforts of
24 the agencies participating in the Program to allocate
25 the level of resources and management attention

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1 necessary to ensure that the ethical, legal, environ-
2 mental, and other appropriate societal concerns re-
3 lated to nanotechnology, including human health
4 concerns, are addressed under the Program, includ-
5 ing the implementation of the research plan de-
6 scribed in subsection (b); and

7 (3) encouraging the agencies required to de-
8 velop the research plan under subsection (b) to iden-
9 tify, assess, and implement suitable mechanisms for
10 the establishment of public-private partnerships for
11 support of environmental, health, and safety re-
12 search.

13 (b) RESEARCH PLAN.—

14 (1) IN GENERAL.—The Coordinator for Societal
15 Dimensions of Nanotechnology shall convene and
16 chair a panel comprised of representatives from the
17 agencies funding research activities under the Envi-
18 ronmental, Health, and Safety program component
19 area of the Program, or any successor program com-
20 ponent area, and from such other agencies as the
21 Coordinator considers necessary to develop, periodi-
22 cally update, and coordinate the implementation of
23 a research plan for this program component area. In
24 developing and updating the plan, the panel con-

1 vened by the Coordinator shall solicit and be respon-
2 sive to recommendations and advice from—

3 (A) the subpanel of the Advisory Panel es-
4 tablished under section 4(a) of the 21st Cen-
5 tury Nanotechnology Research and Develop-
6 ment Act (15 U.S.C. 7503(a)), as amended by
7 this subtitle; and

8 (B) the agencies responsible for environ-
9 mental, health, and safety regulations associ-
10 ated with the production, use, and disposal of
11 nanoscale materials and products.

12 (2) DEVELOPMENT OF STANDARDS.—The plan
13 required under paragraph (1) shall include a de-
14 scription of how the Program will help to ensure the
15 development of—

16 (A) standards related to nomenclature as-
17 sociated with engineered nanoscale materials;

18 (B) engineered nanoscale standard ref-
19 erence materials for environmental, health, and
20 safety testing; and

21 (C) standards related to methods and pro-
22 cedures for detecting, measuring, monitoring,
23 sampling, and testing engineered nanoscale ma-
24 terials for environmental, health, and safety im-
25 pacts.

1 (3) COMPONENTS OF PLAN.—The plan required
2 under paragraph (1) shall, with respect to activities
3 described in paragraphs (1) and (2)—

4 (A) specify near-term research objectives
5 and long-term research objectives;

6 (B) specify milestones associated with each
7 near-term objective and the estimated time and
8 resources required to reach each milestone;

9 (C) with respect to subparagraphs (A) and
10 (B), describe the role of each agency carrying
11 out or sponsoring research in order to meet the
12 objectives specified under subparagraph (A) and
13 to achieve the milestones specified under sub-
14 paragraph (B);

15 (D) specify the funding allocated to each
16 major objective of the plan and the source of
17 funding by agency for the current fiscal year;
18 and

19 (E) estimate the funding required for each
20 major objective of the plan and the source of
21 funding by agency for the following 3 fiscal
22 years.

23 (4) TRANSMITTAL TO CONGRESS.—The plan re-
24 quired under paragraph (1) shall be submitted not
25 later than 60 days after the date of enactment of

1 this Act to the Committee on Commerce, Science,
2 and Transportation of the Senate and the Com-
3 mittee on Science and Technology of the House of
4 Representatives.

5 (5) UPDATING AND APPENDING TO REPORT.—
6 The plan required under paragraph (1) shall be up-
7 dated annually and appended to the report required
8 under section 2(d) of the 21st Century Nanotechnol-
9 ogy Research and Development Act (15 U.S.C.
10 7501(d)).

11 (c) NANOTECHNOLOGY PARTNERSHIPS.—

12 (1) ESTABLISHMENT.—As part of the program
13 authorized by section 9 of the National Science
14 Foundation Authorization Act of 2002, the Director
15 of the National Science Foundation shall provide 1
16 or more grants to establish partnerships as defined
17 by subsection (a)(2) of that section, except that each
18 such partnership shall include 1 or more businesses
19 engaged in the production of nanoscale materials,
20 products, or devices. Partnerships established in ac-
21 cordance with this subsection shall be designated as
22 “Nanotechnology Education Partnerships”.

23 (2) PURPOSE.—Nanotechnology Education
24 Partnerships shall be designed to recruit and help
25 prepare secondary school students to pursue postsec-

1 ondary level courses of instruction in nanotechnol-
2 ogy. At a minimum, grants shall be used to sup-
3 port—

4 (A) professional development activities to
5 enable secondary school teachers to use cur-
6 ricular materials incorporating nanotechnology
7 and to inform teachers about career possibilities
8 for students in nanotechnology;

9 (B) enrichment programs for students, in-
10 cluding access to nanotechnology facilities and
11 equipment at partner institutions, to increase
12 their understanding of nanoscale science and
13 technology and to inform them about career
14 possibilities in nanotechnology as scientists, en-
15 gineers, and technicians; and

16 (C) identification of appropriate nanotech-
17 nology educational materials and incorporation
18 of nanotechnology into the curriculum for sec-
19 ondary school students at one or more organiza-
20 tions participating in a Partnership.

21 (3) SELECTION.—Grants under this subsection
22 shall be awarded in accordance with subsection (b)
23 of such section 9, except that paragraph (3)(B) of
24 that subsection shall not apply.

25 (d) UNDERGRADUATE EDUCATION PROGRAMS.—

1 (1) ACTIVITIES SUPPORTED.—As part of the
2 activities included under the Education and Societal
3 Dimensions program component area, or any suc-
4 cessor program component area, the Program shall
5 support efforts to introduce nanoscale science, engi-
6 neering, and technology into undergraduate science
7 and engineering education through a variety of
8 interdisciplinary approaches. Activities supported
9 may include—

10 (A) development of courses of instruction
11 or modules to existing courses;

12 (B) faculty professional development; and

13 (C) acquisition of equipment and instru-
14 mentation suitable for undergraduate education
15 and research in nanotechnology.

16 (2) COURSE, CURRICULUM, AND LABORATORY
17 IMPROVEMENT AUTHORIZATION.—There are author-
18 ized to be appropriated to the Director of the Na-
19 tional Science Foundation to carry out activities de-
20 scribed in paragraph (1) through the Course, Cur-
21 riculum, and Laboratory Improvement program
22 from amounts authorized under section
23 7002(e)(2)(B) of the America COMPETES Act,
24 \$5,000,000 for fiscal year 2010.

1 (3) ADVANCED TECHNOLOGY EDUCATION AU-
2 THORIZATION.—There are authorized to be appro-
3 priated to the Director of the National Science
4 Foundation to carry out activities described in para-
5 graph (1) through the Advanced Technology Edu-
6 cation program from amounts authorized under sec-
7 tion 7002(e)(2)(B) of the America COMPETES Act,
8 \$5,000,000 for fiscal year 2010.

9 (e) INTERAGENCY WORKING GROUP.—The National
10 Science and Technology Council shall establish under the
11 Nanoscale Science, Engineering, and Technology Sub-
12 committee an Education Working Group to coordinate,
13 prioritize, and plan the educational activities supported
14 under the Program.

15 (f) SOCIETAL DIMENSIONS IN NANOTECHNOLOGY
16 EDUCATION ACTIVITIES.—Activities supported under the
17 Education and Societal Dimensions program component
18 area, or any successor program component area, that in-
19 volve informal, precollege, or undergraduate nanotechnol-
20 ogy education shall include education regarding the envi-
21 ronmental, health and safety, and other societal aspects
22 of nanotechnology.

23 (g) REMOTE ACCESS TO NANOTECHNOLOGY FACILI-
24 TIES.—(1) Agencies supporting nanotechnology research
25 facilities as part of the Program shall require the entities

1 that operate such facilities to allow access via the Internet,
2 and support the costs associated with the provision of such
3 access, by secondary school students and teachers, to in-
4 struments and equipment within such facilities for edu-
5 cational purposes. The agencies may waive this require-
6 ment for cases when particular facilities would be inappro-
7 priate for educational purposes or the costs for providing
8 such access would be prohibitive.

9 (2) The agencies identified in paragraph (1) shall re-
10 quire the entities that operate such nanotechnology re-
11 search facilities to establish and publish procedures, guide-
12 lines, and conditions for the submission and approval of
13 applications for the use of the facilities for the purpose
14 identified in paragraph (1) and shall authorize personnel
15 who operate the facilities to provide necessary technical
16 support to students and teachers.

17 **SEC. 104. TECHNOLOGY TRANSFER.**

18 (a) **PROTOTYPING.—**

19 (1) **ACCESS TO FACILITIES.—**In accordance
20 with section 2(b)(7) of 21st Century Nanotechnology
21 Research and Development Act (15 U.S.C.
22 7501(b)(7)), the agencies supporting nanotechnology
23 research facilities as part of the Program shall pro-
24 vide access to such facilities to companies for the
25 purpose of assisting the companies in the develop-

1 ment of prototypes of nanoscale products, devices, or
2 processes (or products, devices, or processes enabled
3 by nanotechnology) for determining proof of concept.
4 The agencies shall publicize the availability of these
5 facilities and encourage their use by companies as
6 provided for in this section.

7 (2) PROCEDURES.—The agencies identified in
8 paragraph (1)—

9 (A) shall establish and publish procedures,
10 guidelines, and conditions for the submission
11 and approval of applications for use of nano-
12 technology facilities;

13 (B) shall publish descriptions of the capa-
14 bilities of facilities available for use under this
15 subsection, including the availability of tech-
16 nical support; and

17 (C) may waive recovery, require full recov-
18 ery, or require partial recovery of the costs as-
19 sociated with use of the facilities for projects
20 under this subsection.

21 (3) SELECTION AND CRITERIA.—In cases when
22 less than full cost recovery is required pursuant to
23 paragraph (2)(C), projects provided access to nano-
24 technology facilities in accordance with this sub-
25 section shall be selected through a competitive,

1 merit-based process, and the criteria for the selec-
2 tion of such projects shall include at a minimum—

3 (A) the readiness of the project for tech-
4 nology demonstration;

5 (B) evidence of a commitment by the ap-
6 plicant for further development of the project to
7 full commercialization if the proof of concept is
8 established by the prototype; and

9 (C) evidence of the potential for further
10 funding from private sector sources following
11 the successful demonstration of proof of con-
12 cept.

13 The agencies may give special consideration in se-
14 lecting projects to applications that are relevant to
15 important national needs or requirements.

16 (b) USE OF EXISTING TECHNOLOGY TRANSFER PRO-
17 GRAMS.—

18 (1) PARTICIPATING AGENCIES.—Each agency
19 participating in the Program shall—

20 (A) encourage the submission of applica-
21 tions for support of nanotechnology related
22 projects to the Small Business Innovation Re-
23 search Program and the Small Business Tech-
24 nology Transfer Program administered by such
25 agencies; and

1 (B) through the National Nanotechnology
2 Coordination Office and within 6 months after
3 the date of enactment of this Act, submit to the
4 Committee on Commerce, Science, and Trans-
5 portation of the Senate and the Committee on
6 Science and Technology of the House of Rep-
7 resentatives—

8 (i) the plan described in section
9 2(c)(7) of the 21st Century Nanotechnol-
10 ogy Research and Development Act (15
11 U.S.C. 7501(c)(7)); and

12 (ii) a report specifying, if the agency
13 administers a Small Business Innovation
14 Research Program and a Small Business
15 Technology Transfer Program—

16 (I) the number of proposals re-
17 ceived for nanotechnology related
18 projects during the current fiscal year
19 and the previous 2 fiscal years;

20 (II) the number of such pro-
21 posals funded in each year;

22 (III) the total number of nano-
23 technology related projects funded and
24 the amount of funding provided for

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1 fiscal year 2004 through fiscal year
2 2008; and

3 (IV) a description of the projects
4 identified in accordance with sub-
5 clause (III) which received private sec-
6 tor funding beyond the period of
7 phase II support.

8 (2) NATIONAL INSTITUTE OF STANDARDS AND
9 TECHNOLOGY.—The Director of the National Insti-
10 tute of Standards and Technology in carrying out
11 the requirements of section 28 of the National Insti-
12 tute of Standards and Technology Act (15 U.S.C.
13 278n) shall—

14 (A) in regard to subsection (d) of that sec-
15 tion, encourage the submission of proposals for
16 support of nanotechnology related projects; and

17 (B) in regard to subsection (g) of that sec-
18 tion, include a description of how the require-
19 ment of subparagraph (A) of this paragraph is
20 being met, the number of proposals for nano-
21 technology related projects received, the number
22 of such proposals funded, the total number of
23 such projects funded since the beginning of the
24 Technology Innovation Program, and the out-
25 comes of such funded projects in terms of the

1 metrics developed in accordance with such sub-
2 section (g).

3 (3) TIP ADVISORY BOARD.—The TIP Advisory
4 Board established under section 28(k) of the Na-
5 tional Institute of Standards and Technology Act
6 (15 U.S.C. 278n(k)), in carrying out its responsibil-
7 ities under subsection (k)(3), shall provide the Di-
8 rector of the National Institute of Standards and
9 Technology with—

10 (A) advice on how to accomplish the re-
11 quirement of paragraph (2)(A) of this sub-
12 section; and

13 (B) an assessment of the adequacy of the
14 allocation of resources for nanotechnology re-
15 lated projects supported under the Technology
16 Innovation Program.

17 (c) INDUSTRY LIAISON GROUPS.—An objective of the
18 Program shall be to establish industry liaison groups for
19 all industry sectors that would benefit from applications
20 of nanotechnology. The Nanomanufacturing, Industry Li-
21 aison, and Innovation Working Group of the National
22 Science and Technology Council shall actively pursue es-
23 tablishing such liaison groups.

24 (d) COORDINATION WITH STATE INITIATIVES.—Sec-
25 tion 2(b)(5) of the 21st Century Nanotechnology Research

1 and Development Act (15 U.S.C. 7501(b)(5)) is amended
2 to read as follows:

3 “(5) ensuring United States global leadership in
4 the development and application of nanotechnology,
5 including through coordination and leveraging Fed-
6 eral investments with nanotechnology research, de-
7 velopment, and technology transition initiatives sup-
8 ported by the States;”.

9 **SEC. 105. RESEARCH IN AREAS OF NATIONAL IMPORTANCE.**

10 (a) IN GENERAL.—The Program shall include sup-
11 port for nanotechnology research and development activi-
12 ties directed toward application areas that have the poten-
13 tial for significant contributions to national economic com-
14 petitiveness and for other significant societal benefits. The
15 activities supported shall be designed to advance the devel-
16 opment of research discoveries by demonstrating technical
17 solutions to important problems in such areas as nano-
18 electronics, energy efficiency, health care, and water reme-
19 diation and purification. The Advisory Panel shall make
20 recommendations to the Program for candidate research
21 and development areas for support under this section.

22 (b) CHARACTERISTICS.—

23 (1) IN GENERAL.—Research and development
24 activities under this section shall—

1 (A) include projects selected on the basis
2 of applications for support through a competi-
3 tive, merit-based process;

4 (B) involve collaborations among research-
5 ers in academic institutions and industry, and
6 may involve nonprofit research institutions and
7 Federal laboratories, as appropriate;

8 (C) when possible, leverage Federal invest-
9 ments through collaboration with related State
10 initiatives; and

11 (D) include a plan for fostering the trans-
12 fer of research discoveries and the results of
13 technology demonstration activities to industry
14 for commercial development.

15 (2) PROCEDURES.—Determination of the re-
16 quirements for applications under this subsection,
17 review and selection of applications for support, and
18 subsequent funding of projects shall be carried out
19 by a collaboration of no fewer than 2 agencies par-
20 ticipating in the Program. In selecting applications
21 for support, the agencies shall give special consider-
22 ation to projects that include cost sharing from non-
23 Federal sources.

24 (3) INTERDISCIPLINARY RESEARCH CENTERS.—
25 Research and development activities under this sec-

1 tion may be supported through interdisciplinary
2 nanotechnology research centers, as authorized by
3 section 2(b)(4) of the 21st Century Nanotechnology
4 Research and Development Act (15 U.S.C.
5 7501(b)(4)), that are organized to investigate basic
6 research questions and carry out technology dem-
7 onstration activities in areas such as those identified
8 in subsection (a).

9 (c) REPORT.—Reports required under section 2(d) of
10 the 21st Century Nanotechnology Research and Develop-
11 ment Act (15 U.S.C. 7501(d)) shall include a description
12 of research and development areas supported in accord-
13 ance with this section, including the same budget informa-
14 tion as is required for program component areas under
15 paragraphs (1) and (2) of such section 2(d).

16 **SEC. 106. NANOMANUFACTURING RESEARCH.**

17 (a) RESEARCH AREAS.—The Nanomanufacturing
18 program component area, or any successor program com-
19 ponent area, shall include research on—

20 (1) development of instrumentation and tools
21 required for the rapid characterization of nanoscale
22 materials and for monitoring of nanoscale manufac-
23 turing processes; and

1 (2) approaches and techniques for scaling the
2 synthesis of new nanoscale materials to achieve in-
3 dustrial-level production rates.

4 (b) GREEN NANOTECHNOLOGY.—Interdisciplinary
5 research centers supported under the Program in accord-
6 ance with section 2(b)(4) of the 21st Century Nanotech-
7 nology Research and Development Act (15 U.S.C.
8 7501(b)(4)) that are focused on nanomanufacturing re-
9 search and centers established under the authority of sec-
10 tion 105(b)(3) of this subtitle shall include as part of the
11 activities of such centers—

12 (1) research on methods and approaches to de-
13 velop environmentally benign nanoscale products and
14 nanoscale manufacturing processes, taking into con-
15 sideration relevant findings and results of research
16 supported under the Environmental, Health, and
17 Safety program component area, or any successor
18 program component area;

19 (2) fostering the transfer of the results of such
20 research to industry; and

21 (3) providing for the education of scientists and
22 engineers through interdisciplinary studies in the
23 principles and techniques for the design and develop-
24 ment of environmentally benign nanoscale products
25 and processes.

1 (c) REVIEW OF NANOMANUFACTURING RESEARCH
2 AND RESEARCH FACILITIES.—

3 (1) PUBLIC MEETING.—Not later than 12
4 months after the date of enactment of this Act, the
5 National Nanotechnology Coordination Office shall
6 sponsor a public meeting, including representation
7 from a wide range of industries engaged in
8 nanoscale manufacturing, to—

9 (A) obtain the views of participants at the
10 meeting on—

11 (i) the relevance and value of the re-
12 search being carried out under the Nano-
13 manufacturing program component area of
14 the Program, or any successor program
15 component area; and

16 (ii) whether the capabilities of nano-
17 technology research facilities supported
18 under the Program are adequate—

19 (I) to meet current and near-
20 term requirements for the fabrication
21 and characterization of nanoscale de-
22 vices and systems; and

23 (II) to provide access to and use
24 of instrumentation and equipment at
25 the facilities, by means of networking

1 technology, to individuals who are at
2 locations remote from the facilities;
3 and

4 (B) receive any recommendations on ways
5 to strengthen the research portfolio supported
6 under the Nanomanufacturing program compo-
7 nent area, or any successor program component
8 area, and on improving the capabilities of nano-
9 technology research facilities supported under
10 the Program.

11 Companies participating in industry liaison groups
12 shall be invited to participate in the meeting. The
13 Coordination Office shall prepare a report docu-
14 menting the findings and recommendations resulting
15 from the meeting.

16 (2) ADVISORY PANEL REVIEW.—The Advisory
17 Panel shall review the Nanomanufacturing program
18 component area of the Program, or any successor
19 program component area, and the capabilities of
20 nanotechnology research facilities supported under
21 the Program to assess—

22 (A) whether the funding for the Nano-
23 manufacturing program component area, or any
24 successor program component area, is adequate

1 and receiving appropriate priority within the
2 overall resources available for the Program;

3 (B) the relevance of the research being
4 supported to the identified needs and require-
5 ments of industry;

6 (C) whether the capabilities of nanotech-
7 nology research facilities supported under the
8 Program are adequate—

9 (i) to meet current and near-term re-
10 quirements for the fabrication and charac-
11 terization of nanoscale devices and sys-
12 tems; and

13 (ii) to provide access to and use of in-
14 strumentation and equipment at the facili-
15 ties, by means of networking technology, to
16 individuals who are at locations remote
17 from the facilities; and

18 (D) the level of funding that would be
19 needed to support—

20 (i) the acquisition of instrumentation,
21 equipment, and networking technology suf-
22 ficient to provide the capabilities at nano-
23 technology research facilities described in
24 subparagraph (C); and

1 (ii) the operation and maintenance of
2 such facilities.

3 In carrying out its assessment, the Advisory Panel
4 shall take into consideration the findings and rec-
5 ommendations from the report required under para-
6 graph (1).

7 (3) REPORT.—Not later than 18 months after
8 the date of enactment of this Act, the Advisory
9 Panel shall submit to the Committee on Commerce,
10 Science, and Transportation of the Senate and the
11 Committee on Science and Technology of the House
12 of Representatives a report on its assessment re-
13 quired under paragraph (2), along with any rec-
14 ommendations and a copy of the report prepared in
15 accordance with paragraph (1).

16 **SEC. 107. DEFINITIONS.**

17 In this subtitle, terms that are defined in section 10
18 of the 21st Century Nanotechnology Research and Devel-
19 opment Act (15 U.S.C. 7509) have the meaning given
20 those terms in that section.

1 **Subtitle B—Networking and Infor-**
2 **mation Technology Research**
3 **and Development**

4 **SEC. 111. SHORT TITLE.**

5 This subtitle may be cited as the “Networking and
6 Information Technology Research and Development Act of
7 2010”.

8 **SEC. 112. PROGRAM PLANNING AND COORDINATION.**

9 (a) PERIODIC REVIEWS.—Section 101 of the High-
10 Performance Computing Act of 1991 (15 U.S.C. 5511)
11 is amended by adding at the end the following new sub-
12 section:

13 “(d) PERIODIC REVIEWS.—The agencies identified in
14 subsection (a)(3)(B) shall—

15 “(1) periodically assess the contents and fund-
16 ing levels of the Program Component Areas and re-
17 structure the Program when warranted, taking into
18 consideration any relevant recommendations of the
19 advisory committee established under subsection (b);
20 and

21 “(2) ensure that the Program includes large-
22 scale, long-term, interdisciplinary research and de-
23 velopment activities, including activities described in
24 section 104.”.

1 (b) DEVELOPMENT OF STRATEGIC PLAN.—Section
2 101 of such Act (15 U.S.C. 5511) is amended further by
3 adding after subsection (d), as added by subsection (a)
4 of this section, the following new subsection:

5 “(e) STRATEGIC PLAN.—

6 “(1) IN GENERAL.—The agencies identified in
7 subsection (a)(3)(B), working through the National
8 Science and Technology Council and with the assist-
9 ance of the National Coordination Office established
10 under section 102, shall develop, within 12 months
11 after the date of enactment of the Networking and
12 Information Technology Research and Development
13 Act of 2010, and update every 3 years thereafter, a
14 5-year strategic plan to guide the activities described
15 under subsection (a)(1).

16 “(2) CONTENTS.—The strategic plan shall
17 specify near-term and long-term objectives for the
18 Program, the anticipated time frame for achieving
19 the near-term objectives, the metrics to be used for
20 assessing progress toward the objectives, and how
21 the Program will—

22 “(A) foster the transfer of research and
23 development results into new technologies and
24 applications for the benefit of society, including
25 through cooperation and collaborations with

1 networking and information technology re-
2 search, development, and technology transition
3 initiatives supported by the States;

4 “(B) encourage and support mechanisms
5 for interdisciplinary research and development
6 in networking and information technology, in-
7 cluding through collaborations across agencies,
8 across Program Component Areas, with indus-
9 try, with Federal laboratories (as defined in
10 section 4 of the Stevenson-Wydler Technology
11 Innovation Act of 1980 (15 U.S.C. 3703)), and
12 with international organizations;

13 “(C) address long-term challenges of na-
14 tional importance for which solutions require
15 large-scale, long-term, interdisciplinary research
16 and development;

17 “(D) place emphasis on innovative and
18 high-risk projects having the potential for sub-
19 stantial societal returns on the research invest-
20 ment;

21 “(E) strengthen all levels of networking
22 and information technology education and
23 training programs to ensure an adequate, well-
24 trained workforce; and

1 “(F) attract more women and underrep-
2 resented minorities to pursue postsecondary de-
3 grees in networking and information tech-
4 nology.

5 “(3) NATIONAL RESEARCH INFRASTRUCTURE.—The
6 strategic plan developed in accordance with paragraph (1)
7 shall be accompanied by milestones and roadmaps for es-
8 tablishing and maintaining the national research infra-
9 structure required to support the Program, including the
10 roadmap required by subsection (a)(2)(E).

11 “(4) RECOMMENDATIONS.—The entities involved in
12 developing the strategic plan under paragraph (1) shall
13 take into consideration the recommendations—

14 “(A) of the advisory committee established
15 under subsection (b); and

16 “(B) of the stakeholders whose input was solici-
17 tited by the National Coordination Office, as required
18 under section 102(b)(3).

19 “(5) REPORT TO CONGRESS.—The Director of the
20 National Coordination Office shall transmit the strategic
21 plan required under paragraph (1) to the advisory com-
22 mittee, the Committee on Commerce, Science, and Trans-
23 portation of the Senate, and the Committee on Science
24 and Technology of the House of Representatives.”.

1 (e) ADDITIONAL RESPONSIBILITIES OF DIRECTOR.—
2 Section 101(a)(2) of such Act (15 U.S.C. 5511(a)(2)) is
3 amended—

4 (1) by redesignating subparagraphs (E) and
5 (F) as subparagraphs (F) and (G), respectively; and
6 (2) by inserting after subparagraph (D) the fol-
7 lowing new subparagraph:

8 “(E) encourage and monitor the efforts of
9 the agencies participating in the Program to al-
10 locate the level of resources and management
11 attention necessary to ensure that the strategic
12 plan under subsection (e) is developed and exe-
13 cuted effectively and that the objectives of the
14 Program are met;”.

15 (d) ADVISORY COMMITTEE.—Section 101(b)(1) of
16 such Act (15 U.S.C. 5511(b)(1)) is amended by inserting
17 after “an advisory committee on high-performance com-
18 puting,” the following: “in which the co-chairs shall be
19 members of the President’s Council of Advisors on Science
20 and Technology and with the remainder of the com-
21 mittee”.

22 (e) REPORT.—Section 101(a)(3) of such Act (15
23 U.S.C. 5511(a)(3)) is amended—

24 (1) in subparagraph (C)—

1 (A) by striking “is submitted,” and insert-
2 ing “is submitted, the levels for the previous
3 fiscal year,”; and

4 (B) by striking “each Program Component
5 Area;” and inserting “each Program Compo-
6 nent Area and research area supported in ac-
7 cordance with section 104;”;

8 (2) in subparagraph (D)—

9 (A) by striking “each Program Component
10 Area,” and inserting “each Program Compo-
11 nent Area and research area supported in ac-
12 cordance with section 104;”;

13 (B) by striking “is submitted,” and insert-
14 ing “is submitted, the levels for the previous
15 fiscal year,”; and

16 (C) by striking “and” after the semicolon;
17 (3) by redesignating subparagraph (E) as sub-
18 paragraph (G); and

19 (4) by inserting after subparagraph (D) the fol-
20 lowing new subparagraphs:

21 “(E) include a description of how the ob-
22 jectives for each Program Component Area, and
23 the objectives for activities that involve multiple
24 Program Component Areas, relate to the objec-

1 tives of the Program identified in the strategic
2 plan required under subsection (e);

3 “(F) include—

4 “(i) a description of the funding re-
5 quired by the National Coordination Office
6 to perform the functions specified under
7 section 102(b) for the next fiscal year by
8 category of activity;

9 “(ii) a description of the funding re-
10 quired by such Office to perform the func-
11 tions specified under section 102(b) for the
12 current fiscal year by category of activity;
13 and

14 “(iii) the amount of funding provided
15 for such Office for the current fiscal year
16 by each agency participating in the Pro-
17 gram; and”.

18 (f) DEFINITION.—Section 4 of such Act (15 U.S.C.
19 5503) is amended—

20 (1) by redesignating paragraphs (1) through
21 (7) as paragraphs (2) through (8), respectively;

22 (2) by inserting before paragraph (2), as so re-
23 designated, the following new paragraph:

24 “(1) ‘cyber-physical systems’ means physical or
25 engineered systems whose networking and informa-

1 tion technology functions and physical elements are
2 deeply integrated and are actively connected to the
3 physical world through sensors, actuators, or other
4 means to perform monitoring and control func-
5 tions;”;

6 (3) in paragraph (4), as so redesignated—

7 (A) by striking “high-performance com-
8 puting” and inserting “networking and infor-
9 mation technology”; and

10 (B) by striking “supercomputer” and in-
11 serting “high-end computing”;

12 (4) in paragraph (6), as so redesignated, by
13 striking “network referred to as” and all that fol-
14 lows through the semicolon and inserting “network,
15 including advanced computer networks of Federal
16 agencies and departments;”; and

17 (5) in paragraph (7), as so redesignated, by
18 striking “National High-Performance Computing
19 Program” and inserting “networking and informa-
20 tion technology research and development program”.

21 **SEC. 113. LARGE-SCALE RESEARCH IN AREAS OF NATIONAL**
22 **IMPORTANCE.**

23 Title I of such Act (15 U.S.C. 5511) is amended by
24 adding at the end the following new section:

1 **“SEC. 104. LARGE-SCALE RESEARCH IN AREAS OF NA-**
2 **TIONAL IMPORTANCE.**

3 “(a) IN GENERAL.—The Program shall encourage
4 agencies identified in section 101(a)(3)(B) to support
5 large-scale, long-term, interdisciplinary research and de-
6 velopment activities in networking and information tech-
7 nology directed toward application areas that have the po-
8 tential for significant contributions to national economic
9 competitiveness and for other significant societal benefits.
10 Such activities, ranging from basic research to the dem-
11 onstration of technical solutions, shall be designed to ad-
12 vance the development of research discoveries. The advi-
13 sory committee established under section 101(b) shall
14 make recommendations to the Program for candidate re-
15 search and development areas for support under this sec-
16 tion.

17 “(b) CHARACTERISTICS.—

18 “(1) IN GENERAL.—Research and development
19 activities under this section shall—

20 “(A) include projects selected on the basis
21 of applications for support through a competi-
22 tive, merit-based process;

23 “(B) involve collaborations among re-
24 searchers in institutions of higher education
25 and industry, and may involve nonprofit re-

1 search institutions and Federal laboratories, as
2 appropriate;

3 “(C) when possible, leverage Federal in-
4 vestments through collaboration with related
5 State initiatives; and

6 “(D) include a plan for fostering the trans-
7 fer of research discoveries and the results of
8 technology demonstration activities, including
9 from institutions of higher education and Fed-
10 eral laboratories, to industry for commercial de-
11 velopment.

12 “(2) COST-SHARING.—In selecting applications
13 for support, the agencies shall give special consider-
14 ation to projects that include cost sharing from non-
15 Federal sources.

16 “(3) AGENCY COLLABORATION.—If 2 or more
17 agencies identified in section 101(a)(3)(B), or other
18 appropriate agencies, are working on large-scale re-
19 search and development activities in the same area
20 of national importance, then such agencies shall
21 strive to collaborate through joint solicitation and se-
22 lection of applications for support and subsequent
23 funding of projects.

24 “(4) INTERDISCIPLINARY RESEARCH CEN-
25 TERS.—Research and development activities under

1 this section may be supported through interdiscipli-
2 nary research centers that are organized to inves-
3 tigate basic research questions and carry out tech-
4 nology demonstration activities in areas described in
5 subsection (a). Research may be carried out through
6 existing interdisciplinary centers, including those au-
7 thorized under section 7024(b)(2) of the America
8 COMPETES Act (Public Law 110-69; 42 U.S.C.
9 1862o-10).”.

10 **SEC. 114. CYBER-PHYSICAL SYSTEMS AND INFORMATION**
11 **MANAGEMENT.**

12 (a) **ADDITIONAL PROGRAM CHARACTERISTICS.**—Sec-
13 tion 101(a)(1) of such Act (15 U.S.C. 5511(a)(1)) is
14 amended—

15 (1) in subparagraph (H), by striking “and”
16 after the semicolon;

17 (2) in subparagraph (I), by striking the period
18 at the end and inserting a semicolon; and

19 (3) by adding at the end the following new sub-
20 paragraphs:

21 “(J) provide for increased understanding
22 of the scientific principles of cyber-physical sys-
23 tems and improve the methods available for the
24 design, development, and operation of cyber-

1 physical systems that are characterized by high
2 reliability, safety, and security; and

3 “(K) provide for research and development
4 on human-computer interactions, visualization,
5 and information management.”.

6 (b) TASK FORCE.—Title I of such Act (15 U.S.C.
7 5511) is amended further by adding after section 104, as
8 added by section 113 of this Act, the following new sec-
9 tion:

10 **“SEC. 105. UNIVERSITY/INDUSTRY TASK FORCE.**

11 “(a) ESTABLISHMENT.—Not later than 180 days
12 after the date of enactment of the Networking and Infor-
13 mation Technology Research and Development Act of
14 2010, the Director of the National Coordination Office es-
15 tablished under section 102 shall convene a task force to
16 explore mechanisms for carrying out collaborative research
17 and development activities for cyber-physical systems, in-
18 cluding the related technologies required to enable these
19 systems, through a consortium or other appropriate entity
20 with participants from institutions of higher education,
21 Federal laboratories, and industry.

22 “(b) FUNCTIONS.—The task force shall—

23 “(1) develop options for a collaborative model
24 and an organizational structure for such entity
25 under which the joint research and development ac-

1 tivities could be planned, managed, and conducted
2 effectively, including mechanisms for the allocation
3 of resources among the participants in such entity
4 for support of such activities;

5 “(2) propose a process for developing a re-
6 search and development agenda for such entity, in-
7 cluding objectives and milestones;

8 “(3) define the roles and responsibilities for the
9 participants from institutions of higher education,
10 Federal laboratories, and industry in such entity;

11 “(4) propose guidelines for assigning intellec-
12 tual property rights and for the transfer of research
13 results to the private sector; and

14 “(5) make recommendations for how such enti-
15 ty could be funded from Federal, State, and non-
16 governmental sources.

17 “(c) COMPOSITION.—In establishing the task force
18 under subsection (a), the Director of the National Coordi-
19 nation Office shall appoint an equal number of individuals
20 from institutions of higher education and from industry
21 with knowledge and expertise in cyber-physical systems,
22 of which 2 may be selected from Federal laboratories.

23 “(d) REPORT.—Not later than 1 year after the date
24 of enactment of the Networking and Information Tech-
25 nology Research and Development Act of 2010, the Direc-

1 tor of the National Coordination Office shall transmit to
2 the Committee on Commerce, Science, and Transportation
3 of the Senate and the Committee on Science and Tech-
4 nology of the House of Representatives a report describing
5 the findings and recommendations of the task force.”.

6 **SEC. 115. NATIONAL COORDINATION OFFICE.**

7 Section 102 of such Act (15 U.S.C. 5512) is amended
8 to read as follows:

9 **“SEC. 102. NATIONAL COORDINATION OFFICE.**

10 “(a) ESTABLISHMENT.—The Director shall establish
11 a National Coordination Office with a Director and full-
12 time staff.

13 “(b) FUNCTIONS.—The National Coordination Office
14 shall—

15 “(1) provide technical and administrative sup-
16 port to—

17 “(A) the agencies participating in planning
18 and implementing the Program, including such
19 support as needed in the development of the
20 strategic plan under section 101(e); and

21 “(B) the advisory committee established
22 under section 101(b);

23 “(2) serve as the primary point of contact on
24 Federal networking and information technology ac-
25 tivities for government organizations, academia, in-

1 industry, professional societies, State computing and
2 networking technology programs, interested citizen
3 groups, and others to exchange technical and pro-
4 grammatic information;

5 “(3) solicit input and recommendations from a
6 wide range of stakeholders during the development
7 of each strategic plan required under section 101(e)
8 through the convening of at least 1 workshop with
9 invitees from academia, industry, Federal labora-
10 tories, and other relevant organizations and institu-
11 tions;

12 “(4) conduct public outreach, including the dis-
13 semination of findings and recommendations of the
14 advisory committee, as appropriate; and

15 “(5) promote access to and early application of
16 the technologies, innovations, and expertise derived
17 from Program activities to agency missions and sys-
18 tems across the Federal Government and to United
19 States industry.

20 “(e) SOURCE OF FUNDING.—

21 “(1) IN GENERAL.—The operation of the Na-
22 tional Coordination Office shall be supported by
23 funds from each agency participating in the Pro-
24 gram.

1 **SEC. 117. CONFORMING AND TECHNICAL AMENDMENTS.**

2 (a) SECTION 3.—Section 3 of such Act (15 U.S.C.
3 5502) is amended—

4 (1) in the matter preceding paragraph (1), by
5 striking “high-performance computing” and insert-
6 ing “networking and information technology”;

7 (2) in paragraph (1), in the matter preceding
8 subparagraph (A), by striking “high-performance
9 computing” and inserting “networking and informa-
10 tion technology”;

11 (3) in subparagraphs (A) and (F) of paragraph
12 (1), by striking “high-performance computing” each
13 place it appears and inserting “networking and in-
14 formation technology”; and

15 (4) in paragraph (2)—

16 (A) by striking “high-performance com-
17 puting and” and inserting “networking and in-
18 formation technology and”; and

19 (B) by striking “high-performance com-
20 puting network” and inserting “networking and
21 information technology”.

22 (b) TITLE I.—The heading of title I of such Act (15
23 U.S.C. 5511) is amended by striking “**HIGH-PER-**
24 **FORMANCE COMPUTING**” and inserting “**NET-**
25 **WORKING AND INFORMATION TECH-**
26 **NOLOGY**”.

1 (c) SECTION 101.—Section 101 of such Act (15
2 U.S.C. 5511) is amended—

3 (1) in the section heading, by striking “**HIGH-**
4 **PERFORMANCE COMPUTING**” and inserting
5 “**NETWORKING AND INFORMATION TECH-**
6 **NOLOGY RESEARCH AND DEVELOPMENT**”;

7 (2) in subsection (a)—

8 (A) in the subsection heading, by striking
9 “NATIONAL HIGH-PERFORMANCE COMPUTING”
10 and inserting “NETWORKING AND INFORMA-
11 TION TECHNOLOGY RESEARCH AND DEVELOP-
12 MENT”;

13 (B) in paragraph (1) of such subsection—

14 (i) in the matter preceding subpara-
15 graph (A), by striking “National High-Per-
16 formance Computing Program” and insert-
17 ing “networking and information tech-
18 nology research and development pro-
19 gram”;

20 (ii) in subparagraph (A), by striking
21 “high-performance computing, including
22 networking” and inserting “networking
23 and information technology”; and

24 (iii) in subparagraphs (B), (C), and
25 (G), by striking “high-performance” each

1 place it appears and inserting “high-end”;
2 and
3 (C) in paragraph (2) of such subsection—
4 (i) in subparagraphs (A) and (C)—
5 (I) by striking “high-performance
6 computing” each place it appears and
7 inserting “networking and information
8 technology”; and
9 (II) by striking “development,
10 networking,” each place it appears
11 and inserting “development,”; and
12 (ii) in subparagraphs (F) and (G), as
13 redesignated by section 112(c)(1) of this
14 Act, by striking “high-performance” each
15 place it appears and inserting “high-end”;
16 (3) in subsection (b)(1), in the matter pre-
17 ceding subparagraph (A), by striking “high-perform-
18 ance computing” both places it appears and insert-
19 ing “networking and information technology”; and
20 (4) in subsection (c)(1)(A), by striking “high-
21 performance computing” and inserting “networking
22 and information technology”.
23 (d) SECTION 201.—Section 201(a)(1) of such Act
24 (15 U.S.C. 5521(a)(1)) is amended by striking “high-per-
25 formance computing” and all that follows through “net-

1 working;” and inserting “networking and information re-
2 search and development;”.

3 (e) SECTION 202.—Section 202(a) of such Act (15
4 U.S.C. 5522(a)) is amended by striking “high-perform-
5 ance computing” and inserting “networking and informa-
6 tion technology”.

7 (f) SECTION 203.—Section 203(a)(1) of such Act (15
8 U.S.C. 5523(a)(1)) is amended by striking “high-perform-
9 ance computing and networking” and inserting “net-
10 working and information technology”.

11 (g) SECTION 204.—Section 204(a)(1) of such Act
12 (15 U.S.C. 5524(a)(1)) is amended—

13 (1) in subparagraph (A), by striking “high-per-
14 formance computing systems and networks” and in-
15 serting “networking and information technology sys-
16 tems and capabilities”; and

17 (2) in subparagraph (C), by striking “high-per-
18 formance computing” and inserting “networking and
19 information technology”.

20 (h) SECTION 205.—Section 205(a) of such Act (15
21 U.S.C. 5525(a)) is amended by striking “computational”
22 and inserting “networking and information technology”.

23 (i) SECTION 206.—Section 206(a) of such Act (15
24 U.S.C. 5526(a)) is amended by striking “computational

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1 research” and inserting “networking and information
2 technology research”.

3 (j) SECTION 208.—Section 208 of such Act (15
4 U.S.C. 5528) is amended—

5 (1) in the section heading, by striking “**HIGH-**
6 **PERFORMANCE COMPUTING**” and inserting
7 “**NETWORKING AND INFORMATION TECH-**
8 **NOLOGY**”; and

9 (2) in subsection (a)—

10 (A) in paragraph (1), by striking “High-
11 performance computing and associated” and in-
12 sserting “Networking and information”;

13 (B) in paragraph (2), by striking “high-
14 performance computing” and inserting “net-
15 working and information technologies”;

16 (C) in paragraph (4), by striking “high-
17 performance computers and associated” and in-
18 sserting “networking and information”; and

19 (D) in paragraph (5), by striking “high-
20 performance computing and associated” and in-
21 sserting “networking and information”.

22 **Subtitle C—Other OSTP Provisions**

23 **SEC. 121. FEDERAL SCIENTIFIC COLLECTIONS.**

24 (a) MANAGEMENT OF SCIENTIFIC COLLECTIONS.—
25 The Office of Science and Technology Policy, in consulta-

1 tion with relevant Federal agencies, shall ensure the devel-
2 opment of formal policies for the management and use of
3 Federal scientific collections to improve the quality, orga-
4 nization, access, including online access, and long-term
5 preservation of such collections for the benefit of the sci-
6 entific enterprise.

7 (b) DEFINITION.—For the purposes of this section,
8 the term “scientific collection” means a set of physical
9 specimens, living or inanimate, created for the purpose of
10 supporting science and serving as a long-term research
11 asset, rather than for their market value as collectibles
12 or their historical, artistic, or cultural significance.

13 (c) CLEARINGHOUSE.—The Office of Science and
14 Technology Policy, in consultation with relevant Federal
15 agencies, shall ensure the development of an online clear-
16 inghouse for information on the contents of and access
17 to Federal scientific collections.

18 (d) DISPOSAL OF COLLECTIONS.—The policies devel-
19 oped under subsection (a) shall—

20 (1) require that, before disposing of a scientific
21 collection, a Federal agency shall—

22 (A) conduct a review of the research value
23 of the collection; and

1 (B) consult with researchers who have
2 used the collection, and other potentially inter-
3 ested parties, concerning—

4 (i) the collection's value for research
5 purposes; and

6 (ii) possible additional educational
7 uses for the collection; and

8 (2) include procedures for Federal agencies to
9 transfer scientific collections they no longer need to
10 researchers at institutions or other entities qualified
11 to manage the collections.

12 (e) COST PROJECTIONS.—The Office of Science and
13 Technology Policy, in consultation with relevant Federal
14 agencies, shall develop a common set of methodologies to
15 be used by Federal agencies for the assessment and pro-
16 jection of costs associated with the management and pres-
17 ervation of their scientific collections.

18 **SEC. 122. COORDINATION OF MANUFACTURING RESEARCH**
19 **AND DEVELOPMENT.**

20 (a) INTERAGENCY COMMITTEE.—The Director of the
21 Office of Science and Technology Policy shall establish or
22 designate an interagency committee under the National
23 Science and Technology Council with the responsibility for
24 planning and coordinating Federal programs and activities
25 in manufacturing research and development.

1 (b) RESPONSIBILITIES OF COMMITTEE.—The inter-
2 agency committee established or designated under sub-
3 section (a) shall—

4 (1) coordinate the manufacturing research and
5 development programs and activities of the Federal
6 agencies;

7 (2) establish goals and priorities for manufac-
8 turing research and development that will strengthen
9 United States manufacturing; and

10 (3) develop and update every 5 years thereafter
11 a strategic plan to guide Federal programs and ac-
12 tivities in support of manufacturing research and de-
13 velopment, which shall—

14 (A) specify and prioritize near-term and
15 long-term research and development objectives,
16 the anticipated time frame for achieving the ob-
17 jectives, and the metrics for use in assessing
18 progress toward the objectives;

19 (B) specify the role of each Federal agency
20 in carrying out or sponsoring research and de-
21 velopment to meet the objectives of the stra-
22 tegic plan; and

23 (C) describe how the Federal agencies sup-
24 porting manufacturing research and develop-
25 ment will foster the transfer of research and de-

1 development results into new manufacturing tech-
2 nologies, processes, and products for the benefit
3 of society and the national interest.

4 (c) RECOMMENDATIONS.—In the development of the
5 strategic plan required under subsection (b)(3), the Direc-
6 tor of the Office of Science and Technology Policy, work-
7 ing through the interagency committee, shall take into
8 consideration the recommendations of a wide range of
9 stakeholders, including representatives from diverse man-
10 ufacturing companies, academia, and other relevant orga-
11 nizations and institutions.

12 (d) REPORT TO CONGRESS.—Not later than 1 year
13 after the date of enactment of this Act, the Director of
14 the Office of Science and Technology Policy shall transmit
15 the strategic plan developed under subsection (b)(3) to the
16 Committee on Commerce, Science, and Transportation of
17 the Senate, and the Committee on Science and Technology
18 of the House of Representatives, and shall transmit subse-
19 quent updates to those committees when completed.

20 **SEC. 123. INTERAGENCY PUBLIC ACCESS COMMITTEE.**

21 (a) ESTABLISHMENT.—The Director of the Office of
22 Science and Technology Policy shall establish a working
23 group under the National Science and Technology Council
24 with the responsibility to coordinate Federal science agen-
25 cy research and policies related to the dissemination and

1 long-term stewardship of the results of unclassified re-
2 search, including digital data and peer-reviewed scholarly
3 publications, supported wholly, or in part, by funding from
4 the Federal science agencies.

5 (b) RESPONSIBILITIES.—The working group estab-
6 lished under subsection (a) shall—

7 (1) coordinate the development or designation
8 of uniform standards for research data, the struc-
9 ture of full text and metadata, navigation tools, and
10 other applications to achieve interoperability across
11 Federal science agencies, across science and engi-
12 neering disciplines, and between research data and
13 scholarly publications, taking into account existing
14 consensus standards, including international stand-
15 ards;

16 (2) coordinate Federal science agency programs
17 and activities that support research and education
18 on tools and systems required to ensure preservation
19 and stewardship of all forms of digital research data,
20 including scholarly publications;

21 (3) work with international science and tech-
22 nology counterparts to maximize interoperability be-
23 tween United States based unclassified research
24 databases and international databases and reposi-
25 tories;

1 (4) solicit input and recommendations from,
2 and collaborate with, non-Federal stakeholders, in-
3 cluding universities, nonprofit and for-profit pub-
4 lishers, libraries, federally funded research scientists,
5 and other organizations and institutions with a stake
6 in long term preservation and access to the results
7 of federally funded research; and

8 (5) establish priorities for coordinating the de-
9 velopment of any Federal science agency policies re-
10 lated to public access to the results of federally
11 funded research to maximize uniformity of such poli-
12 cies with respect to their benefit to, and potential
13 economic or other impact on, the science and engi-
14 neering enterprise and the stakeholders thereof.

15 (c) PATENT OR COPYRIGHT LAW.—Nothing in this
16 section shall be construed to affect any right under the
17 provisions of title 17 or 35, United States Code.

18 (d) REPORT TO CONGRESS.—Not later than 1 year
19 after the date of enactment of this Act, the Director of
20 the Office of Science and Technology Policy shall transmit
21 a report to Congress describing the status of any Federal
22 science agency policies related to public access to the re-
23 sults of federally funded research, including a description
24 of any priorities developed under subsection (b)(5).

1 (e) DEFINITION.—For the purposes of this section,
2 the term “Federal science agency” means any Federal
3 agency with an annual extramural research expenditure
4 of over \$100,000,000.

5 **TITLE II—NATIONAL SCIENCE**
6 **FOUNDATION**

7 **SEC. 201. SHORT TITLE.**

8 This title may be cited as the “National Science
9 Foundation Authorization Act of 2010”.

10 **Subtitle A—General Provisions**

11 **SEC. 211. DEFINITIONS.**

12 In this title:

13 (1) DIRECTOR.—The term “Director” means
14 the Director of the National Science Foundation es-
15 tablished under section 2 of the National Science
16 Foundation Act of 1950 (42 U.S.C. 1861).

17 (2) FOUNDATION.—The term “Foundation”
18 means the National Science Foundation established
19 under section 2 of the National Science Foundation
20 Act of 1950 (42 U.S.C. 1861).

21 (3) INSTITUTION OF HIGHER EDUCATION.—The
22 term “institution of higher education” has the
23 meaning given such term in section 101(a) of the
24 Higher Education Act of 1965 (20 U.S.C. 1001(a)).

1 (4) STATE.—The term “State” means one of
2 the several States, the District of Columbia, the
3 Commonwealth of Puerto Rico, the Virgin Islands,
4 Guam, American Samoa, the Commonwealth of the
5 Northern Mariana Islands, or any other territory or
6 possession of the United States.

7 (5) STEM.—The term “STEM” means science,
8 technology, engineering, and mathematics.

9 (6) UNITED STATES.—The term “United
10 States” means the several States, the District of Co-
11 lumbia, the Commonwealth of Puerto Rico, the Vir-
12 gin Islands, Guam, American Samoa, the Common-
13 wealth of the Northern Mariana Islands, and any
14 other territory or possession of the United States.

15 **SEC. 212. AUTHORIZATION OF APPROPRIATIONS.**

16 (a) FISCAL YEAR 2011.—

17 (1) IN GENERAL.—There are authorized to be
18 appropriated to the Foundation \$8,219,670,000 for
19 fiscal year 2011.

20 (2) SPECIFIC ALLOCATIONS.—Of the amount
21 authorized under paragraph (1)—

22 (A) \$6,600,000,000 shall be made avail-
23 able for research and related activities;

24 (B) \$1,104,000,000 shall be made avail-
25 able for education and human resources;

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1 (C) \$166,000,000 shall be made available
2 for major research equipment and facilities con-
3 struction;

4 (D) \$330,000,000 shall be made available
5 for agency operations and award management;

6 (E) \$4,840,000 shall be made available for
7 the Office of the National Science Board; and

8 (F) \$14,830,000 shall be made available
9 for the Office of Inspector General.

10 (b) FISCAL YEAR 2012.—

11 (1) IN GENERAL.—There are authorized to be
12 appropriated to the Foundation \$8,932,080,000 for
13 fiscal year 2012.

14 (2) SPECIFIC ALLOCATIONS.—Of the amount
15 authorized under paragraph (1)—

16 (A) \$7,128,000,000 shall be made avail-
17 able for research and related activities;

18 (B) \$1,192,320,000 shall be made avail-
19 able for education and human resources;

20 (C) \$235,000,000 shall be made available
21 for major research equipment and facilities con-
22 struction;

23 (D) \$356,400,000 shall be made available
24 for agency operations and award management;

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1 (E) \$5,010,000 shall be made available for
2 the Office of the National Science Board; and

3 (F) \$15,350,000 shall be made available
4 for the Office of Inspector General.

5 (e) FISCAL YEAR 2013.—

6 (1) IN GENERAL.—There are authorized to be
7 appropriated to the Foundation \$9,555,160,000 for
8 fiscal year 2013.

9 (2) SPECIFIC ALLOCATIONS.—Of the amount
10 authorized under paragraph (1)—

11 (A) \$7,626,960,000 shall be made avail-
12 able for research and related activities;

13 (B) \$1,275,780,000 shall be made avail-
14 able for education and human resources;

15 (C) \$250,000,000 shall be made available
16 for major research equipment and facilities con-
17 struction;

18 (D) \$381,350,000 shall be made available
19 for agency operations and award management;

20 (E) \$5,180,000 shall be made available for
21 the Office of the National Science Board; and

22 (F) \$15,890,000 shall be made available
23 for the Office of Inspector General.

24 (d) FISCAL YEAR 2014.—

1 (1) IN GENERAL.—There are authorized to be
2 appropriated to the Foundation \$10,112,940,000 for
3 fiscal year 2014.

4 (2) SPECIFIC ALLOCATIONS.—Of the amount
5 authorized under paragraph (1)—

6 (A) \$8,084,580,000 shall be made avail-
7 able for research and related activities;

8 (B) \$1,352,330,000 shall be made avail-
9 able for education and human resources;

10 (C) \$250,000,000 shall be made available
11 for major research equipment and facilities con-
12 struction;

13 (D) \$404,230,000 shall be made available
14 for agency operations and award management;

15 (E) \$5,370,000 shall be made available for
16 the Office of the National Science Board; and

17 (F) \$16,440,000 shall be made available
18 for the Office of Inspector General.

19 (e) FISCAL YEAR 2015.—

20 (1) IN GENERAL.—There are authorized to be
21 appropriated to the Foundation \$10,704,180,000 for
22 fiscal year 2015.

23 (2) SPECIFIC ALLOCATIONS.—Of the amount
24 authorized under paragraph (1)—

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1 (A) \$8,569,650,000 shall be made avail-
2 able for research and related activities;

3 (B) \$1,433,470,000 shall be made avail-
4 able for education and human resources;

5 (C) \$250,000,000 shall be made available
6 for major research equipment and facilities con-
7 struction;

8 (D) \$428,480,000 shall be made available
9 for agency operations and award management;

10 (E) \$5,550,000 shall be made available for
11 the Office of the National Science Board; and

12 (F) \$17,020,000 shall be made available
13 for the Office of Inspector General.

14 **SEC. 213. NATIONAL SCIENCE BOARD ADMINISTRATIVE**
15 **AMENDMENTS.**

16 (a) STAFFING AT THE NATIONAL SCIENCE BOARD.—
17 Section 4(g) of the National Science Foundation Act of
18 1950 (42 U.S.C. 1863(g)) is amended by striking “not
19 more than 5”.

20 (b) SCIENCE AND ENGINEERING INDICATORS DUE
21 DATE.—Section 4(j)(1) of the National Science Founda-
22 tion Act of 1950 (42 U.S.C. 1863(j)(1)) is amended by
23 striking “January 15” and inserting “May 31”.

24 (c) NATIONAL SCIENCE BOARD REPORTS.—Section
25 4(j)(2) of the National Science Foundation Act of 1950

1 (42 U.S.C. 1863(j)(2)) is amended by inserting “within
2 the authority of the Foundation (or otherwise as requested
3 by the appropriate Congressional committees of jurisdic-
4 tion or the President)” after “individual policy matters”.

5 (d) BOARD ADHERENCE TO SUNSHINE ACT.—Sec-
6 tion 15(a) of the National Science Foundation Authoriza-
7 tion Act of 2002 (42 U.S.C. 1862n–5(a)) is amended—

8 (1) by striking paragraph (3) and redesignating
9 paragraphs (4) and (5) as paragraphs (3) and (4),
10 respectively;

11 (2) in paragraph (3), as so redesignated by
12 paragraph (1) of this subsection—

13 (A) by striking “February 15” and insert-
14 ing “April 15”; and

15 (B) by striking “the audit required under
16 paragraph (3) along with” and inserting “any”;
17 and

18 (3) in paragraph (4), as so redesignated by
19 paragraph (1) of this subsection, by striking “To fa-
20 cilitate the audit required under paragraph (3) of
21 this subsection, the” and inserting “The”.

22 **SEC. 214. BROADER IMPACTS REVIEW CRITERION.**

23 (a) GOALS.—The Foundation shall apply a Broader
24 Impacts Review Criterion to achieve the following goals:

1 (1) Increased economic competitiveness of the
2 United States.

3 (2) Development of a globally competitive
4 STEM workforce.

5 (3) Increased participation of women and
6 underrepresented minorities in STEM.

7 (4) Increased partnerships between academia
8 and industry.

9 (5) Improved pre-K-12 STEM education and
10 teacher development.

11 (6) Improved undergraduate STEM education.

12 (7) Increased public scientific literacy.

13 (8) Increased national security.

14 (b) POLICY.—Not later than 6 months after the date
15 of enactment of this Act, the Director shall develop and
16 implement a policy for the Broader Impacts Review Cri-
17 terion that—

18 (1) provides for educating professional staff at
19 the Foundation, merit review panels, and applicants
20 for Foundation research grants on the policy devel-
21 oped under this subsection;

22 (2) clarifies that the activities of grant recipi-
23 ents undertaken to satisfy the Broader Impacts Re-
24 view Criterion shall—

1 (A) to the extent practicable employ proven
2 strategies and models and draw on existing pro-
3 grams and activities; and

4 (B) when novel approaches are justified,
5 build on the most current research results;

6 (3) allows for some portion of funds allocated to
7 broader impacts under a research grant to be used
8 for assessment and evaluation of the broader im-
9 pacts activity;

10 (4) encourages institutions of higher education
11 and other nonprofit education or research organiza-
12 tions to develop and provide, either as individual in-
13 stitutions or in partnerships thereof, appropriate
14 training and programs to assist Foundation-funded
15 principal investigators at their institutions in achiev-
16 ing the goals of the Broader Impacts Review Cri-
17 terion as described in subsection (a); and

18 (5) requires principal investigators applying for
19 Foundation research grants to provide evidence of
20 institutional support for the portion of the investiga-
21 tor's proposal designed to satisfy the Broader Im-
22 pacts Review Criterion, including evidence of rel-
23 evant training, programs, and other institutional re-
24 sources available to the investigator from either their

1 home institution or organization or another institu-
2 tion or organization with relevant expertise.

3 **SEC. 215. NATIONAL CENTER FOR SCIENCE AND ENGINEER-**
4 **ING STATISTICS.**

5 (a) ESTABLISHMENT.—There is established within
6 the Foundation a National Center for Science and Engi-
7 neering Statistics (in this section referred to as the “Cen-
8 ter”), that shall serve as a central Federal clearinghouse
9 for the collection, interpretation, analysis, and dissemina-
10 tion of objective data on science, engineering, technology,
11 and research and development.

12 (b) DUTIES.—In carrying out subsection (a) of this
13 section, the Director, acting through the Center shall—

14 (1) collect, acquire, analyze, report, and dis-
15 seminate statistical data related to the science and
16 engineering enterprise in the United States and
17 other nations that is relevant and useful to practi-
18 tioners, researchers, policymakers, and the public,
19 including statistical data on—

20 (A) research and development trends;

21 (B) the science and engineering workforce;

22 (C) United States competitiveness in
23 science, engineering, technology, and research
24 and development; and

1 (D) the condition and progress of United
2 States STEM education;

3 (2) support research using the data it collects,
4 and on methodologies in areas related to the work
5 of the Center; and

6 (3) support the education and training of re-
7 searchers in the use of large-scale, nationally rep-
8 resentative data sets.

9 (e) STATISTICAL REPORTS.—The Director or the Na-
10 tional Science Board, acting through the Center, shall
11 issue regular, and as necessary, special statistical reports
12 on topics related to the national and international science
13 and engineering enterprise such as the biennial report re-
14 quired by section 4 (j)(1) of the National Science Founda-
15 tion Act of 1950 (42 U.S.C. 1863(j)(1)) on indicators of
16 the state of science and engineering in the United States.

17 **Subtitle B—Research and** 18 **Innovation**

19 **SEC. 221. SUPPORT FOR POTENTIALLY TRANSFORMATIVE** 20 **RESEARCH.**

21 (a) POLICY.—The Director shall establish a policy
22 that requires the Foundation to use at least 5 percent of
23 its research budget to fund high-risk, high-reward basic
24 research proposals. Support for facilities and infrastruc-
25 ture, including preconstruction design and operations and

1 maintenance of major research facilities, shall not be
2 counted as part of the research budget for the purposes
3 of this section.

4 (b) IMPLEMENTATION.—In implementing such policy,
5 the Foundation may—

6 (1) develop solicitations specifically for high-
7 risk, high-reward basic research;

8 (2) establish review panels for the primary pur-
9 pose of selecting high-risk, high-reward proposals or
10 modify instructions to standard review panels to re-
11 quire identification of high-risk, high-reward pro-
12 posals; and

13 (3) support workshops and participate in con-
14 ferences with the primary purpose of identifying new
15 opportunities for high-risk, high-reward basic re-
16 search, especially at interdisciplinary interfaces.

17 (c) DEFINITION.—For purposes of this section, the
18 term “high-risk, high-reward basic research” means re-
19 search driven by ideas that have the potential to radically
20 change our understanding of an important existing sci-
21 entific or engineering concept, or leading to the creation
22 of a new paradigm or field of science or engineering, and
23 that is characterized by its challenge to current under-
24 standing or its pathway to new frontiers.

1 **SEC. 222. FACILITATING INTERDISCIPLINARY COLLABORA-**
2 **TIONS FOR NATIONAL NEEDS.**

3 (a) IN GENERAL.—The Director shall award competi-
4 tive, merit-based awards in amounts not to exceed
5 \$5,000,000 over a period of up to 5 years to interdiscipli-
6 nary research collaborations that are likely to assist in ad-
7 dressing critical challenges to national security, competi-
8 tiveness, and societal well-being and that—

9 (1) involve at least 2 co-equal principal inves-
10 tigators at the same or different institutions;

11 (2) draw upon well-integrated, diverse teams of
12 investigators, including students or postdoctoral re-
13 searchers, from one or more disciplines; and

14 (3) foster creativity and pursue high-risk, high-
15 reward research.

16 (b) PRIORITY.—In selecting grant recipients under
17 this section, the Director shall give priority to applicants
18 that propose to utilize advances in cyberinfrastructure and
19 simulation-based science and engineering.

20 **SEC. 223. NATIONAL SCIENCE FOUNDATION MANUFAC-**
21 **TURING RESEARCH.**

22 The Director shall carry out a program to award
23 merit-reviewed, competitive grants to institutions of higher
24 education to support fundamental research leading to
25 transformative advances in manufacturing technologies,
26 processes, and enterprises that will support United States

1 manufacturing through improved performance, produc-
2 tivity, sustainability, and competitiveness. Research areas
3 may include—

- 4 (1) nanomanufacturing;
- 5 (2) manufacturing and construction machines
6 and equipment, including robotics, automation, and
7 other intelligent systems;
- 8 (3) manufacturing enterprise systems;
- 9 (4) advanced sensing and control techniques;
- 10 (5) materials processing; and
- 11 (6) information technologies for manufacturing,
12 including predictive and real-time models and sim-
13 ulations, and virtual manufacturing.

14 **SEC. 224. STRENGTHENING INSTITUTIONAL RESEARCH**
15 **PARTNERSHIPS.**

16 (a) IN GENERAL.—For any Foundation research
17 grant, in an amount greater than \$2,000,000, to be car-
18 ried out through a partnership that includes one or more
19 minority-serving institutions or predominantly under-
20 graduate institutions and one or more institutions de-
21 scribed in subsection (b), the Director shall award funds
22 directly, according to the budget justification described in
23 the grant proposal, to at least two of the institutions of
24 higher education in the partnership, including at least one
25 minority-serving institution or one predominantly under-

1 graduate institution, to ensure a strong and equitable
2 partnership.

3 (b) INSTITUTIONS.—The institutions referred to in
4 subsection (a) are institutions of higher education that are
5 among the 100 institutions receiving, over the 3-year pe-
6 riod immediately preceding the awarding of grants, the
7 highest amount of research funding from the Foundation.

8 **SEC. 225. NATIONAL SCIENCE BOARD REPORT ON MID-
9 SCALE INSTRUMENTATION.**

10 (a) MID-SCALE RESEARCH INSTRUMENTATION
11 NEEDS.—The National Science Board shall evaluate the
12 needs, across all disciplines supported by the Foundation,
13 for mid-scale research instrumentation that falls between
14 the instruments funded by the Major Research Instrumen-
15 tation program and the very large projects funded by the
16 Major Research Equipment and Facilities Construction
17 program.

18 (b) REPORT ON MID-SCALE RESEARCH INSTRUMEN-
19 TATION PROGRAM.—Not later than 1 year after the date
20 of enactment of this Act, the National Science Board shall
21 submit to Congress a report on mid-scale research instru-
22 mentation at the Foundation. At a minimum, this report
23 shall include—

24 (1) the findings from the Board's evaluation of
25 instrumentation needs required under subsection (a),

1 including a description of differences across dis-
2 ciplines and Foundation research directorates;

3 (2) a recommendation or recommendations re-
4 garding how the Foundation should set priorities for
5 mid-scale instrumentation across disciplines and
6 Foundation research directorates;

7 (3) a recommendation or recommendations re-
8 garding the appropriateness of expanding existing
9 programs, including the Major Research Instrumen-
10 tation program or the Major Research Equipment
11 and Facilities Construction program, to support
12 more instrumentation at the mid-scale;

13 (4) a recommendation or recommendations re-
14 garding the need for and appropriateness of a new,
15 Foundation-wide program or initiative in support of
16 mid-scale instrumentation, including any rec-
17 ommendations regarding the administration of and
18 budget for such a program or initiative and the ap-
19 propriate scope of instruments to be funded under
20 such a program or initiative; and

21 (5) any recommendation or recommendations
22 regarding other options for supporting mid-scale re-
23 search instrumentation at the Foundation.

1 **SEC. 226. SENSE OF CONGRESS ON OVERALL SUPPORT FOR**
2 **RESEARCH INFRASTRUCTURE AT THE FOUN-**
3 **DATION.**

4 It is the sense of Congress that the Foundation
5 should strive to keep the percentage of the Foundation
6 budget devoted to research infrastructure in the range of
7 24 to 27 percent, as recommended in the 2003 National
8 Science Board report entitled “Science and Engineering
9 Infrastructure for the 21st Century”.

10 **SEC. 227. PARTNERSHIPS FOR INNOVATION.**

11 (a) IN GENERAL.—The Director shall carry out a
12 program to award merit-reviewed, competitive grants to
13 institutions of higher education to establish and to expand
14 partnerships that promote innovation and increase the
15 economic and social impact of research by developing tools
16 and resources to connect new scientific discoveries to prac-
17 tical uses.

18 (b) PARTNERSHIPS.—

19 (1) IN GENERAL.—To be eligible for funding
20 under this section, an institution of higher education
21 must propose establishment of a partnership that—

22 (A) includes at least one private sector en-
23 tity; and

24 (B) may include other institutions of high-
25 er education, public sector institutions, private

1 sector entities, and social enterprise nonprofit
2 organizations.

3 (2) PRIORITY.—In selecting grant recipients
4 under this section, the Director shall give priority to
5 partnerships that include one or more institutions of
6 higher education that are among the 100 institu-
7 tions receiving, over the 3-year period immediately
8 preceding the awarding of grants, the highest
9 amount of research funding from the Foundation
10 and at least one of the following:

11 (A) A minority serving institution.

12 (B) A primarily undergraduate institution.

13 (C) A 2-year institution of higher edu-
14 cation.

15 (c) PROGRAM.—Proposals funded under this section
16 shall seek to—

17 (1) increase the economic or social impact of
18 the most promising research at the institution or in-
19 stitutions of higher education that are members of
20 the partnership through knowledge transfer or com-
21 mercialization;

22 (2) increase the engagement of faculty and stu-
23 dents across multiple disciplines and departments,
24 including faculty and students in schools of business

1 and other appropriate non-STEM fields and dis-
2 ciplines in knowledge transfer activities;

3 (3) enhance education and mentoring of stu-
4 dents and faculty in innovation and entrepreneur-
5 ship through networks, courses, and development of
6 best practices and curricula;

7 (4) strengthen the culture of the institution or
8 institutions of higher education to undertake and
9 participate in activities related to innovation and
10 leading to economic or social impact;

11 (5) broaden the participation of all types of in-
12 stitutions of higher education in activities to meet
13 STEM workforce needs and promote innovation and
14 knowledge transfer; and

15 (6) build lasting partnerships with local and re-
16 gional businesses, local and State governments, and
17 other relevant entities.

18 (d) ADDITIONAL CRITERIA.—In selecting grant re-
19 cipients under this section, the Director shall also consider
20 the extent to which the applicants are able to demonstrate
21 evidence of institutional support for, and commitment
22 to—

23 (1) achieving the goals of the program as de-
24 scribed in subsection (e);

1 (2) expansion to an institution-wide program if
2 the initial proposal is not for an institution-wide pro-
3 gram; and

4 (3) sustaining any new innovation tools and re-
5 sources generated from funding under this program.

6 (e) LIMITATION.—No funds provided under this sec-
7 tion may be used to construct or renovate a building or
8 structure.

9 **SEC. 228. PRIZE AWARDS.**

10 (a) SHORT TITLE.—This section may be cited as the
11 “Generating Extraordinary New Innovations in the
12 United States Act of 2010”.

13 (b) IN GENERAL.—The Director shall carry out a
14 pilot program to award innovation inducement cash prizes
15 in any area of research supported by the Foundation. The
16 Director may carry out a program of cash prizes only in
17 conformity with this section.

18 (c) TOPICS.—In identifying topics for prize competi-
19 tions under this section, the Director shall—

20 (1) consult widely both within and outside the
21 Federal Government;

22 (2) give priority to high-risk, high-reward re-
23 search challenges and to problems whose solution
24 could improve the economic competitiveness of the
25 United States; and

1 (3) give consideration to the extent to which the
2 topics have the potential to raise public awareness
3 about federally sponsored research.

4 (d) TYPES OF CONTESTS.—The Director shall con-
5 sider all categories of innovation inducement prizes, in-
6 cluding—

7 (1) contests in which the award is to the first
8 team or individual who accomplishes a stated objec-
9 tive; and

10 (2) contests in which the winner is the team or
11 individual who comes closest to achieving an objec-
12 tive within a specified time.

13 (e) ADVERTISING AND ANNOUNCEMENT.—

14 (1) ADVERTISING AND SOLICITATION OF COM-
15 PETITORS.—The Director shall widely advertise
16 prize competitions to encourage broad participation,
17 including by individuals, institutions of higher edu-
18 cation, nonprofit organizations, and businesses.

19 (2) ANNOUNCEMENT THROUGH FEDERAL REG-
20 ISTER NOTICE.—The Director shall announce each
21 prize competition by publishing a notice in the Fed-
22 eral Register. This notice shall include the subject of
23 the competition, the duration of the competition, the
24 eligibility requirements for participation in the com-
25 petition, the process for participants to register for

1 the competition, the amount of the prize, and the
2 criteria for awarding the prize, including the method
3 by which the prize winner or winners will be se-
4 lected.

5 (3) TIME TO ANNOUNCEMENT.—The Director
6 shall announce a prize competition within 18 months
7 after receipt of appropriated funds.

8 (f) FUNDING.—

9 (1) FUNDING SOURCES.—Prizes under this sec-
10 tion shall consist of Federal appropriated funds and
11 any funds raised pursuant to donations authorized
12 under section 11(f) of the National Science Founda-
13 tion Act of 1950 (42 U.S.C. 1870(f)) for specific
14 prize competitions.

15 (2) ANNOUNCEMENT OF PRIZES.—The Director
16 may not issue a notice as required by subsection
17 (e)(2) until all of the funds needed to pay out the
18 announced amount of the prize have been appro-
19 priated or committed in writing by another entity
20 pursuant to paragraph (1).

21 (g) ELIGIBILITY.—To be eligible to win a prize under
22 this section, an individual or entity—

23 (1) shall have complied with all of the require-
24 ments under this section;

1 (2) in the case of a private entity, shall be in-
2 corporated in and maintain a primary place of busi-
3 ness in the United States, and in the case of an in-
4 dividual, whether participating singly or in a group,
5 shall be a United States citizen or national, or an
6 alien lawfully admitted to the United States for per-
7 manent residence; and

8 (3) shall not be a Federal entity, a Federal em-
9 ployee acting within the scope of his or her employ-
10 ment, or a person employed at a Federal laboratory
11 acting within the scope of his or her employment.

12 (h) AWARDS.—

13 (1) NUMBER OF COMPETITIONS.—The Director
14 may announce up to 5 prize competitions through
15 the end of fiscal year 2013.

16 (2) SIZE OF AWARD.—The Director may deter-
17 mine the amount of each prize award based on the
18 prize topic, but no award shall be less than
19 \$1,000,000 or greater than \$3,000,000.

20 (3) SELECTING WINNERS.—The Director may
21 convene an expert panel to select a winner of a prize
22 competition. If the panel is unable to select a win-
23 ner, the Director shall determine the winner of the
24 prize.

1 (4) PUBLIC OUTREACH.—The Director shall
2 publicly award prizes utilizing the Foundation’s ex-
3 isting public affairs and public outreach resources.

4 (i) ADMINISTERING THE COMPETITION.—The Direc-
5 tor may enter into an agreement with a private, nonprofit
6 entity to administer the prize competition, subject to the
7 provisions of this section.

8 (j) INTELLECTUAL PROPERTY.—The Federal Gov-
9 ernment shall not, by virtue of offering or awarding a
10 prize under this section, be entitled to any intellectual
11 property rights derived as a consequence of, or in direct
12 relation to, the participation by a registered participant
13 in a competition authorized by this section. This sub-
14 section shall not be construed to prevent the Federal Gov-
15 ernment from negotiating a license for the use of intellec-
16 tual property developed for a prize competition under this
17 section.

18 (k) LIABILITY.—The Director may require a reg-
19 istered participant in a prize competition under this sec-
20 tion to waive liability against the Federal Government for
21 injuries and damages that result from participation in
22 such competition.

23 (l) NONSUBSTITUTION.—Any programs created
24 under this section shall not be considered a substitute for
25 Federal research and development programs.

1 (m) REPORTING REQUIREMENT.—Not later than 5
2 years after the date of enactment of this Act, the National
3 Science Board shall transmit to Congress a report con-
4 taining the results of a review and assessment of the pilot
5 program under this section, including—

6 (1) a description of the nature and status of all
7 completed or ongoing prize competitions carried out
8 under this section, including any scientific achieve-
9 ments, publications, intellectual property, or com-
10 mercialized technology that resulted from such com-
11 petitions;

12 (2) any recommendations regarding changes to,
13 the termination of, or continuation of the pilot pro-
14 gram;

15 (3) an analysis of whether the program is at-
16 tracting contestants more diverse than the Founda-
17 tion's traditional academic constituency;

18 (4) an analysis of whether public awareness of
19 innovation or of the goal of the particular prize or
20 prizes is enhanced;

21 (5) an analysis of whether the Foundation's
22 public image or ability to increase public scientific
23 literacy is enhanced through the use of innovation
24 inducement prizes; and

1 (6) an analysis of the extent to which private
2 funds are being used to support registered partici-
3 pants.

4 (n) EARLY TERMINATION OF CONTESTS.—The Di-
5 rector shall terminate a prize contest before any registered
6 participant wins if the Director determines that an unreg-
7 istered entity has produced an innovation that would oth-
8 erwise have qualified for the prize award.

9 (o) AUTHORIZATION OF APPROPRIATIONS.—

10 (1) IN GENERAL.—

11 (A) AWARDS.—There are authorized to be
12 appropriated to the Director for the period en-
13 compassing fiscal years 2011 through 2013
14 \$12,000,000 for carrying out this section.

15 (B) ADMINISTRATION.—Of the amounts
16 authorized in subparagraph (A), not more than
17 15 percent for each fiscal year shall be available
18 for the administrative costs of carrying out this
19 section.

20 (2) CARRYOVER OF FUNDS.—Funds appro-
21 priated for prize awards under this section shall re-
22 main available until expended, and may be trans-
23 ferred, reprogrammed, or expended for other pur-
24 poses as authorized by law only after the expiration
25 of 7 fiscal years after the fiscal year for which the

1 funds were originally appropriated. No provision in
2 this section permits obligation or payment of funds
3 in violation of section 1341 of title 31 of the United
4 States Code (commonly referred to as the Anti-Defi-
5 ciency Act).

6 **Subtitle C—STEM Education and** 7 **Workforce Training**

8 **SEC. 241. GRADUATE STUDENT SUPPORT.**

9 (a) FINDING.—The Congress finds that—

10 (1) the Integrative Graduate Education and Re-
11 search Traineeship program is an important pro-
12 gram for training the next generation of scientists
13 and engineers in team-based interdisciplinary re-
14 search and problem solving, and for providing them
15 with the many additional skills, such as communica-
16 tion skills, needed to thrive in diverse STEM ca-
17 reers; and

18 (2) the Integrative Graduate Education and Re-
19 search Traineeship program is no less valuable to
20 the preparation and support of graduate students
21 than the Foundation’s Graduate Research Fellow-
22 ship program.

23 (b) EQUAL TREATMENT OF IGERT AND GRF.—Be-
24 ginning in fiscal year 2011, the Director shall increase or,
25 if necessary, decrease funding for the Foundation’s Inte-

1 grative Graduate Education and Research Traineeship
2 program (or any program by which it is replaced) at least
3 at the same rate as it increases or decreases funding for
4 the Graduate Research Fellowship program.

5 (c) SUPPORT FOR GRADUATE STUDENT RESEARCH
6 FROM THE RESEARCH ACCOUNT.—For each of the fiscal
7 years 2011 through 2015, at least 50 percent of the total
8 Foundation funds allocated to the Integrative Graduate
9 Education and Research Traineeship program and the
10 Graduate Research Fellowship program shall come from
11 funds appropriated for Research and Related Activities.

12 (d) COST OF EDUCATION ALLOWANCE FOR GRF
13 PROGRAM.—Section 10 of the National Science Founda-
14 tion Act of 1950 (42 U.S.C. 1869) is amended—

15 (1) by inserting “(a)” before “The Foundation
16 is authorized”; and

17 (2) by adding at the end the following new sub-
18 section:

19 “(b) The Director shall establish for each year the
20 amount to be awarded for scholarships and fellowships
21 under this section for that year. Each such scholarship
22 and fellowship shall include a cost of education allowance
23 of \$12,000, subject to any restrictions on the use of cost
24 of education allowance as determined by the Director.”.

1 **SEC. 242. POSTDOCTORAL FELLOWSHIP IN STEM EDU-**
2 **CATION RESEARCH.**

3 (a) IN GENERAL.—The Director shall establish
4 postdoctoral fellowships in STEM education research to
5 provide recent doctoral degree graduates in STEM fields
6 with the necessary skills to assume leadership roles in
7 STEM education research, program development, and
8 evaluation in our Nation's diverse educational institutions.

9 (b) AWARDS.—

10 (1) DURATION.—Fellowships may be awarded
11 under this section for a period of up to 24 months
12 in duration, renewable for an additional 12 months.
13 The Director shall establish criteria for eligibility for
14 renewal of the fellowship.

15 (2) STIPEND.—The Director shall determine
16 the amount of the award for a fellowship, which
17 shall include a stipend and a research allowance, and
18 may include an educational allowance.

19 (3) LOCATION.—A fellowship shall be awarded
20 for research at any institution of higher education
21 that offers degrees in fields supported by the Foun-
22 dation, or at any institution or organization that the
23 Director determines is eligible for education research
24 grants from the Foundation.

25 (4) NUMBER OF AWARDS.—The Director may
26 award up to 20 new fellowships per year.

1 (c) RESEARCH.—Fellowships under this section shall
2 be awarded for research on STEM education at any edu-
3 cational level, including grades pre-K-12, undergraduate,
4 graduate, and general public education, in both formal and
5 informal settings. Research topics may include—

- 6 (1) learning processes and progressions;
- 7 (2) knowledge transfer, including curriculum
8 development;
- 9 (3) uses of technology as teaching and learning
10 tools;
- 11 (4) integrating STEM fields; and
- 12 (5) assessment of student learning and program
13 evaluation.

14 (d) ELIGIBILITY.—To be eligible for a fellowship
15 under this section, an individual must—

- 16 (1) be a United States citizen or national, or an
17 alien lawfully admitted to the United States for per-
18 manent residence, at the time of application; and
- 19 (2) have received a doctoral degree in one of the
20 STEM fields supported by the Foundation within 3
21 years prior to the fellowship application deadline.

1 **SEC. 243. ROBERT NOYCE TEACHER SCHOLARSHIP PRO-**
2 **GRAM.**

3 (a) SECTION 10 AMENDMENTS.—Section 10 of the
4 National Science Foundation Authorization Act of 2002
5 (42 U.S.C. 1862n–1) is amended—

6 (1) in subsection (c)(4), by striking “Service re-
7 quired under this paragraph shall be performed in a
8 high-need local educational agency.”; and

9 (2) in subsection (c), by adding at the end a
10 new paragraph as follows:

11 “(5) EXCEPTION.—The period of service obliga-
12 tion under paragraph (4) shall be reduced by 1 year
13 for scholarship recipients whose service is performed
14 in a high-need local educational agency. The Direc-
15 tor shall establish and maintain a central clearing-
16 house of information on teaching opportunities avail-
17 able in high-need local educational agencies through-
18 out the United States, which shall be made available
19 to individuals having a service obligation under this
20 section.”.

21 (b) SECTION 10A AMENDMENTS.—Section 10A of
22 the National Science Foundation Authorization Act of
23 2002 (42 U.S.C. 1862n–1a) is amended in subsection
24 (h)(1) by striking “50” and inserting “30”.

1 **SEC. 244. INSTITUTIONS SERVING PERSONS WITH DISABIL-**
2 **ITIES.**

3 For the purposes of the activities and programs sup-
4 ported by the Foundation, institutions of higher education
5 chartered to serve large numbers of students with disabil-
6 ities, including Gallaudet University, Landmark College,
7 and the National Technical Institute for the Deaf, shall
8 have a designation consistent with the designation for
9 other institutions that serve populations underrepresented
10 in STEM to ensure that institutions of higher education
11 chartered to serve persons with disabilities can benefit
12 from STEM bridge programs and from research partner-
13 ships with major research universities. Nothing in this sec-
14 tion shall be construed to amend or otherwise affect any
15 of the definitions for minority-serving institutions under
16 title III or title V of the Higher Education Act of 1965.

17 **SEC. 245. INSTITUTIONAL INTEGRATION.**

18 (a) INNOVATION THROUGH INSTITUTIONAL INTE-
19 GRATION.—The Director shall award grants for the insti-
20 tutional integration of projects funded by the Foundation
21 with a focus on education, or on broadening participation
22 in STEM by underrepresented groups, for the purpose of
23 increasing collaboration and coordination across funded
24 projects and institutions and expanding the impact of such
25 projects within and among institutions of higher education
26 in an innovative and sustainable manner.

1 (b) PROGRAM ACTIVITIES.—The program under this
2 section shall support integrative activities that involve the
3 strategic and innovative combination of Foundation-fund-
4 ed projects and that provide for—

5 (1) additional opportunities to increase the re-
6 cruitment, retention, and degree attainment of
7 underrepresented groups in STEM disciplines;

8 (2) the inclusion of programming, practices,
9 and policies that encourage the integration of edu-
10 cation and research;

11 (3) seamless transitions from one educational
12 level to another; and

13 (4) other activities that expand and deepen the
14 impact of Foundation-funded projects with a focus
15 on education, or on broadening participation in
16 STEM by underrepresented groups, and enhance
17 their sustainability.

18 (c) REVIEW CRITERIA.—In selecting recipients of
19 grants under this section, the Director shall consider at
20 a minimum—

21 (1) the extent to which the proposed project ad-
22 dresses the goals of project and program integration
23 and adds value to the existing funded projects;

1 (2) the extent to which there is a proven record
2 of success for the existing projects on which the pro-
3 posed integration project is based; and

4 (3) the extent to which the proposed project ad-
5 dresses the modification of programming, practices,
6 and policies necessary to achieve the purpose de-
7 scribed in subsection (a).

8 (d) PRIORITY.—In selecting recipients of grants
9 under this section, the Director shall give priority to pro-
10 posals for which a senior institutional administrator, in-
11 cluding a dean or other administrator of equal or higher
12 rank, serves as the principal investigator.

13 **SEC. 246. POSTDOCTORAL RESEARCH FELLOWSHIPS.**

14 (a) IN GENERAL.—The Director shall establish a
15 Foundation-wide postdoctoral research fellowship pro-
16 gram, to award competitive, merit-based postdoctoral re-
17 search fellowships in any field of research supported by
18 the Foundation.

19 (b) DURATION AND AMOUNT.—Fellowships may be
20 awarded under this section for a period of up to 3 years
21 in duration. The Director shall determine the amount of
22 the award for a fellowship, which shall include a stipend
23 and a research allowance, and may include an educational
24 allowance.

1 (c) ELIGIBILITY.—To be eligible to receive a fellow-
2 ship under this section, an individual—

3 (1) must be a United States citizen or national,
4 or an alien lawfully admitted to the United States
5 for permanent residence, at the time of application;

6 (2) must have received a doctoral degree in any
7 field of research supported by the Foundation within
8 3 years prior to the fellowship application deadline,
9 or will complete a doctoral degree no more than 1
10 year after the application deadline; and

11 (3) may not have previously received funding as
12 the principal investigator of a research grant from
13 the Foundation, unless such funding was received as
14 a graduate student.

15 (d) PRIORITY.—In evaluating applications for fellow-
16 ships under this section, the Director shall give priority
17 to applications that include—

18 (1) proposals for interdisciplinary research; or

19 (2) proposals for high-risk, high-reward re-
20 search.

21 (e) ADDITIONAL CONSIDERATIONS.—In evaluating
22 applications for fellowships under this section, the Direc-
23 tor shall give consideration to the goal of promoting the
24 participation of individuals identified in section 33 or 34

1 of the Science and Engineering Equal Opportunities Act
2 (42 U.S.C. 1885a or 1885b).

3 (f) NONSUBSTITUTION.—The fellowship program au-
4 thorized under this section is not intended to replace or
5 reduce support for postdoctoral research through existing
6 programs at the Foundation.

7 **SEC. 247. BROADENING PARTICIPATION TRAINING AND**
8 **OUTREACH.**

9 The Director shall provide education and training—

10 (1) to Foundation staff and grant proposal re-
11 view panels on effective mechanisms and tools for
12 broadening participation in STEM by underrep-
13 resented groups, including reviewer selection and
14 mitigation of implicit bias in the review process; and

15 (2) to Foundation staff on related outreach ap-
16 proaches.

17 **SEC. 248. TRANSFORMING UNDERGRADUATE EDUCATION**
18 **IN STEM.**

19 Section 17 of the National Science Foundation Au-
20 thorization Act of 2002 (42 U.S.C. 1862n–6) is amended
21 to read as follows:

22 **“SEC. 17. TRANSFORMING UNDERGRADUATE EDUCATION**
23 **IN STEM.**

24 “(a) IN GENERAL.—The Director shall award grants,
25 on a competitive, merit-reviewed basis, to institutions of

1 higher education (or to consortia thereof) to reform under-
2 graduate STEM education for the purpose of increasing
3 the number and quality of students studying toward and
4 completing baccalaureate degrees in STEM and improving
5 the STEM learning outcomes for all undergraduate stu-
6 dents, including through—

7 “(1) development, implementation, and assess-
8 ment of innovative, research-based approaches to
9 transforming the teaching and learning of discipli-
10 nary or interdisciplinary STEM at the under-
11 graduate level; and

12 “(2) expansion of successful STEM reform ef-
13 forts beyond a single course or group of courses to
14 achieve reform within an entire academic unit, or ex-
15 pansion of successful reform efforts beyond a single
16 academic unit to other STEM academic units within
17 an institution or to comparable academic units at
18 other institutions.

19 “(b) USES OF FUNDS.—Activities supported by
20 grants under this section may include—

21 “(1) creation of multidisciplinary or inter-
22 disciplinary courses or programs that formalize col-
23 laborations for the purpose of improved student in-
24 struction and research in STEM;

1 “(2) expansion of undergraduate STEM re-
2 search opportunities to include interdisciplinary re-
3 search opportunities and research opportunities in
4 industry, at Federal labs, and at international re-
5 search institutions or research sites;

6 “(3) implementation or expansion of bridge pro-
7 grams, including programs that address student
8 transition from 2-year to 4-year institutions, and co-
9 hort, tutoring, or mentoring programs proven to en-
10 hance student recruitment or persistence to degree
11 completion in STEM, including recruitment or per-
12 sistence to degree completion of individuals identi-
13 fied in section 33 or 34 of the Science and Engineer-
14 ing Equal Opportunities Act (42 U.S.C. 1885a or
15 1885b);

16 “(4) improvement of undergraduate STEM
17 education for nonmajors, including education ma-
18 jors;

19 “(5) implementation of evidence-based, tech-
20 nology-driven reform efforts that directly impact un-
21 dergraduate STEM instruction or research experi-
22 ences;

23 “(6) development and implementation of faculty
24 and graduate teaching assistant development pro-
25 grams focused on improved instruction, mentoring,

1 assessment of student learning, and support of un-
2 dergraduate STEM students;

3 “(7) support for graduate students and
4 postdoctoral fellows to participate in instructional or
5 assessment activities at primarily undergraduate in-
6 stitutions; and

7 “(8) research on teaching and learning of
8 STEM at the undergraduate level related to the pro-
9 posed reform effort, including assessment and eval-
10 uation of the proposed reform activities, research on
11 scalability and sustainability of approaches to re-
12 form, and development and implementation of longi-
13 tudinal studies of students included in the proposed
14 reform effort.

15 “(e) PARTNERSHIP.—An institution of higher edu-
16 cation may partner with one or more other nonprofit edu-
17 cation or research organizations, including scientific and
18 engineering societies, for the purposes of carrying out the
19 activities authorized under this section.

20 “(d) SELECTION PROCESS.—

21 “(1) APPLICATIONS.—An institution of higher
22 education seeking a grant under this section shall
23 submit an application to the Director at such time,
24 in such manner, and containing such information as

1 the Director may require. The application shall in-
2 clude, at a minimum—

3 “(A) a description of the proposed reform
4 effort;

5 “(B) a description of the research findings
6 that will serve as the basis for the proposed re-
7 form effort or, in the case of applications that
8 propose an expansion of a previously imple-
9 mented reform effort, a description of the pre-
10 viously implemented reform effort, including in-
11 dicators of success such as data on student re-
12 cruitment, persistence to degree completion,
13 and academic achievement;

14 “(C) evidence of institutional support for,
15 and commitment to, the proposed reform effort,
16 including long-term commitment to implement
17 successful strategies from the current reform
18 effort beyond the academic unit or units in-
19 cluded in the grant proposal or to disseminate
20 successful strategies to other institutions;

21 “(D) a description of existing or planned
22 institutional policies and practices regarding
23 faculty hiring, promotion, tenure, and teaching
24 assignment that reward faculty contributions to
25 undergraduate STEM education; and

1 “(E) a description of the plans for assess-
2 ment and evaluation of the proposed reform ac-
3 tivities, including evidence of participation by
4 individuals with experience in assessment and
5 evaluation of teaching and learning programs.

6 “(2) REVIEW OF APPLICATIONS.—In selecting
7 grant recipients under this section, the Director
8 shall consider at a minimum—

9 “(A) the likelihood of success in under-
10 taking the proposed effort at the institution
11 submitting the application, including the extent
12 to which the faculty, staff, and administrators
13 of the institution are committed to making the
14 proposed institutional reform a priority of the
15 participating academic unit or units;

16 “(B) the degree to which the proposed re-
17 form will contribute to change in institutional
18 culture and policy such that a greater value is
19 placed on faculty engagement in undergraduate
20 education;

21 “(C) the likelihood that the institution will
22 sustain or expand the reform beyond the period
23 of the grant; and

24 “(D) the degree to which scholarly assess-
25 ment and evaluation plans are included in the

1 design of the reform effort, including the degree
2 to which such assessment and evaluation con-
3 tribute to the systematic accumulation of
4 knowledge on STEM education.

5 “(3) PRIORITY.—For proposals that include an
6 expansion of existing reform efforts beyond a single
7 academic unit, the Director shall give priority to
8 proposals for which a senior institutional adminis-
9 trator, including a dean or other administrator of
10 equal or higher rank, serves as the principal investi-
11 gator or a coprincipal investigator.

12 “(4) GRANT DISTRIBUTION.—The Director
13 shall ensure, to the extent practicable, that grants
14 awarded under this section are made to a variety of
15 types of institutions of higher education.”.

16 **SEC. 249. 21ST CENTURY GRADUATE EDUCATION.**

17 (a) IN GENERAL.—The Director shall award grants,
18 on a competitive, merit-reviewed basis, to institutions of
19 higher education to implement or expand research-based
20 reforms in master’s and doctoral level STEM education
21 that emphasize preparation for diverse careers utilizing
22 STEM degrees, including at diverse types of institutions
23 of higher education, in industry, and at government agen-
24 cies and research laboratories.

1 (b) USES OF FUNDS.—Activities supported by grants
2 under this section may include—

3 (1) creation of multidisciplinary or interdiscipli-
4 nary courses or programs for the purpose of im-
5 proved student instruction and research in STEM;

6 (2) expansion of graduate STEM research op-
7 portunities to include interdisciplinary research op-
8 portunities and research opportunities in industry,
9 at Federal laboratories, and at international re-
10 search institutions or research sites;

11 (3) development and implementation of future
12 faculty training programs focused on improved in-
13 struction, mentoring, assessment of student learn-
14 ing, and support of undergraduate STEM students;

15 (4) support and training for graduate students
16 to participate in instructional activities beyond the
17 traditional teaching assistantship, and especially as
18 part of ongoing educational reform efforts, including
19 at pre-K-12 schools, informal science education insti-
20 tutions, and primarily undergraduate institutions;

21 (5) creation, improvement, or expansion of in-
22 novative graduate programs such as science master's
23 degree programs;

24 (6) development and implementation of semi-
25 nars, workshops, and other professional development

1 activities that increase the ability of graduate stu-
2 dents to engage in innovation, technology transfer,
3 and entrepreneurship;

4 (7) development and implementation of semi-
5 nars, workshops, and other professional development
6 activities that increase the ability of graduate stu-
7 dents to effectively communicate their research find-
8 ings to technical audiences outside of their own dis-
9 cipline and to nontechnical audiences;

10 (8) expansion of successful STEM reform ef-
11 forts beyond a single academic unit to other STEM
12 academic units within an institution or to com-
13 parable academic units at other institutions; and

14 (9) research on teaching and learning of STEM
15 at the graduate level related to the proposed reform
16 effort, including assessment and evaluation of the
17 proposed reform activities and research on scalability
18 and sustainability of approaches to reform.

19 (c) PARTNERSHIP.—An institution of higher edu-
20 cation may partner with one or more other nonprofit edu-
21 cation or research organizations, including scientific and
22 engineering societies, for the purposes of carrying out the
23 activities authorized under this section.

24 (d) SELECTION PROCESS.—

1 (1) APPLICATIONS.—An institution of higher
2 education seeking a grant under this section shall
3 submit an application to the Director at such time,
4 in such manner, and containing such information as
5 the Director may require. The application shall in-
6 clude, at a minimum—

7 (A) a description of the proposed reform
8 effort;

9 (B) in the case of applications that propose
10 an expansion of a previously implemented re-
11 form effort at the applicant's institution or at
12 other institutions, a description of the pre-
13 viously implemented reform effort;

14 (C) evidence of institutional support for,
15 and commitment to, the proposed reform effort,
16 including long-term commitment to implement
17 successful strategies from the current reform
18 effort beyond the academic unit or units in-
19 cluded in the grant proposal or to disseminate
20 successful strategies to other institutions; and

21 (D) a description of the plans for assess-
22 ment and evaluation of the grant proposed re-
23 form activities.

1 (2) REVIEW OF APPLICATIONS.—In selecting
2 grant recipients under this section, the Director
3 shall consider at a minimum—

4 (A) the likelihood of success in under-
5 taking the proposed effort at the institution
6 submitting the application, including the extent
7 to which the faculty, staff, and administrators
8 of the institution are committed to making the
9 proposed institutional reform a priority of the
10 participating academic unit or units;

11 (B) the degree to which the proposed re-
12 form will contribute to change in institutional
13 culture and policy such that a greater value is
14 placed on preparing graduate students for di-
15 verse careers utilizing STEM degrees;

16 (C) the likelihood that the institution will
17 sustain or expand the reform beyond the period
18 of the grant; and

19 (D) the degree to which scholarly assess-
20 ment and evaluation plans are included in the
21 design of the reform effort.

22 (e) REPEAL.—Section 7034 of the America COM-
23 PETES Act (42 U.S.C. 1862o–13) is repealed.

1 **SEC. 250. UNDERGRADUATE BROADENING PARTICIPATION**
2 **PROGRAM.**

3 (a) UNDERGRADUATE BROADENING PARTICIPATION
4 PROGRAM.—The Foundation shall continue to support the
5 Historically Black Colleges and Universities Under-
6 graduate Program, the Louis Stokes Alliances for Minor-
7 ity Participation program, and the Tribal Colleges and
8 Universities Program as separate programs at least
9 through September 30, 2011.

10 (b) PLAN.—Prior to any realignment or consolidation
11 of the programs described in subsection (a), in addition
12 to the Hispanic-Serving Institutions Undergraduate Pro-
13 gram required by section 7033 of the America COM-
14 PETES Act (42 U.S.C. 1862o–12), the Director shall de-
15 velop a plan clarifying the objectives and rationale for such
16 changes. The plan shall include a description of how such
17 changes would result in—

18 (1) meeting or strengthening the common goal
19 of the separate programs to increase the number of
20 individuals from underrepresented groups attaining
21 undergraduate STEM degrees; and

22 (2) addressing the unique needs of the different
23 types of minority serving institutions and underrep-
24 resented groups currently provided for by the sepa-
25 rate programs.

1 (c) RECOMMENDATIONS.—In the development of the
2 plan required under subsection (b), the Director shall at
3 a minimum—

4 (1) consider the recommendations and findings
5 of the National Academy of Sciences report required
6 by section 7032 of the America COMPETES Act
7 (Public Law 110–69); and

8 (2) solicit recommendations and feedback from
9 a wide range of stakeholders, including representa-
10 tives from minority serving institutions, other insti-
11 tutions of higher education, and other entities with
12 expertise on effective mechanisms to increase the re-
13 cruitment and retention of members of underrep-
14 resented groups in STEM fields, and the attainment
15 of STEM degrees by underrepresented groups.

16 (d) APPROVAL BY CONGRESS.—The plan developed
17 under this section shall be transmitted to Congress at least
18 3 months prior to the implementation of any realignment
19 or consolidation of the programs described in subsection
20 (a).

21 **SEC. 251. GRAND CHALLENGES IN EDUCATION RESEARCH.**

22 (a) IN GENERAL.—The Director and the Secretary
23 of Education shall collaborate, in consultation with the Di-
24 rector of the National Institutes of Health, in—

1 (1) identifying, prioritizing, and developing
2 strategies to address grand challenges in research
3 and development on the teaching and learning of
4 STEM at the pre-K-12 level, in formal and informal
5 settings, for diverse learning populations, including
6 individuals identified in section 33 or 34 of the
7 Science and Engineering Equal Opportunities Act
8 (42 U.S.C. 1885a or 1885b);

9 (2) carrying out research and development to
10 address the grand challenges identified in paragraph
11 (1); and

12 (3) ensuring the dissemination of the results of
13 such research and development.

14 (b) STAKEHOLDER INPUT.—In identifying the grand
15 challenges required in subsection (a), the Director and the
16 Secretary shall—

17 (1) take into consideration critical research
18 gaps identified in existing reports, including reports
19 by the National Academies, on the teaching and
20 learning of STEM at the pre-K-12 level in formal
21 and informal settings; and

22 (2) solicit input from a wide range of stake-
23 holders, including local and State education officials,
24 STEM teachers, STEM education researchers, sci-
25 entific and engineering societies, STEM faculty at

1 institutions of higher education, informal STEM
2 education providers, businesses with a large STEM
3 workforce, and other stakeholders in the teaching
4 and learning of STEM at the pre-K-12 level, and
5 may enter into an arrangement with the National
6 Research Council for these purposes.

7 (c) TOPICS TO CONSIDER.—In identifying the grand
8 challenges required in subsection (a), the Director and the
9 Secretary, in order to provide students with increased ac-
10 cess to rigorous courses of study in STEM, increase the
11 number of students who are prepared for advanced study
12 and careers in STEM, and increase the effective teaching
13 of STEM subjects, shall at a minimum consider the fol-
14 lowing topics:

15 (1) Research on scalability, sustainability, and
16 replication of successful STEM activities, programs,
17 and models, in formal and informal environments.

18 (2) Research that utilizes a systems approach
19 to identifying challenges and opportunities to im-
20 prove the teaching and learning of STEM, including
21 development and evaluation of model systems that
22 support improved teaching and learning of STEM
23 across entire school districts and States, and encom-
24 passing and integrating the teaching and learning of

1 STEM in formal and informal venues, and in K-12
2 schools and institutions of higher education.

3 (3) Research to understand what makes a
4 STEM teacher effective and STEM teacher profes-
5 sional development effective, including development
6 of tools and methodologies to measure STEM teach-
7 er effectiveness.

8 (4) Research and development on cyber-enabled
9 tools and programs and television based tools and
10 programs for learning and teaching STEM, includ-
11 ing development of tools and methodologies for as-
12 ssuming cyber and television enabled teaching and
13 learning.

14 (5) Research and development on STEM teach-
15 ing and learning in informal environments, including
16 development of tools and methodologies for assessing
17 STEM teaching and learning in informal environ-
18 ments.

19 (6) Research and development on how inte-
20 grating engineering with mathematics and science
21 education may—

22 (A) improve student learning of mathe-
23 matics and science;

24 (B) increase student interest and persist-
25 ence in STEM; or

1 (C) improve student understanding of engi-
2 neering design principles and of the built world.

3 (7) Research to understand what makes hands-
4 on, inquiry-based classroom experiences effective, in-
5 cluding development of tools and methodologies for
6 assessing such experiences.

7 (d) REPORT TO CONGRESS.—Not later than 18
8 months after the date of enactment of this Act, the Direc-
9 tor and the Secretary shall report back to Congress with
10 a description of—

11 (1) the grand challenges identified pursuant to
12 this section;

13 (2) the role of each agency in supporting re-
14 search and development activities to address the
15 grand challenges;

16 (3) the common metrics that will be used to as-
17 sess progress toward meeting the grand challenges;

18 (4) plans for periodically updating the grand
19 challenges;

20 (5) how the agencies will disseminate the re-
21 sults of research and development activities carried
22 out under this section to STEM education practi-
23 tioners, to other Federal agencies that support
24 STEM programs and activities, and to non-Federal
25 funders of STEM education; and

1 (6) how the agencies will support implementa-
2 tion of best practices identified by the research and
3 development activities.

4 **SEC. 252. RESEARCH EXPERIENCES FOR UNDERGRADU-**
5 **ATES.**

6 (a) **RESEARCH SITES.**—The Director shall award
7 grants, on a merit-reviewed, competitive basis, to institu-
8 tions of higher education, nonprofit organizations, or con-
9 sortia of such institutions and organizations, for sites des-
10 ignated by the Director to provide research experiences for
11 10 or more undergraduate STEM students, with consider-
12 ation given to the goal of promoting the participation of
13 individuals identified in section 33 or 34 of the Science
14 and Engineering Equal Opportunities Act (42 U.S.C.
15 1885a or 1885b). The Director shall ensure that—

16 (1) at least half of the students participating in
17 a program funded by a grant under this subsection
18 at each site shall be recruited from institutions of
19 higher education where research opportunities in
20 STEM are limited, including 2-year institutions;

21 (2) the awards provide undergraduate research
22 experiences in a wide range of STEM disciplines;

23 (3) the awards support a variety of projects, in-
24 cluding independent investigator-led projects, inter-

1 disciplinary projects, and multi-institutional projects
2 (including virtual projects);

3 (4) students participating in each program
4 funded have mentors, including during the academic
5 year to the extent practicable, to help connect the
6 students' research experiences to the overall aca-
7 demic course of study and to help students achieve
8 success in courses of study leading to a bacca-
9 laurate degree in a STEM field;

10 (5) mentors and students are supported with
11 appropriate salary or stipends; and

12 (6) student participants are tracked, for em-
13 ployment and continued matriculation in STEM
14 fields, through receipt of the undergraduate degree
15 and for at least 3 years thereafter.

16 (b) INCLUSION OF UNDERGRADUATES IN STANDARD
17 RESEARCH GRANTS.—The Director shall require that
18 every recipient of a research grant from the Foundation
19 proposing to include 1 or more undergraduate students
20 in carrying out the research under the grant shall request
21 support, including stipend support, for such under-
22 graduate students as part of the research proposal itself
23 rather than as a supplement to the research proposal, un-
24 less such undergraduate participation was not foreseeable
25 at the time of the original proposal.

1 **SEC. 253. LABORATORY SCIENCE PILOT PROGRAM.**

2 Section 7026 of the America COMPETES Act (Pub-
3 lic Law 110–69) is amended by striking subsections (d)
4 and (e).

5 **TITLE III—STEM EDUCATION**

6 **SEC. 301. COORDINATION OF FEDERAL STEM EDUCATION.**

7 (a) **SHORT TITLE.**—This section may be cited as the
8 “STEM Education Coordination Act of 2010”.

9 (b) **DEFINITION.**—In this section, the term “STEM”
10 means science, technology, engineering, and mathematics.

11 (c) **ESTABLISHMENT.**—The Director of the Office of
12 Science and Technology Policy shall establish a committee
13 under the National Science and Technology Council with
14 the responsibility to coordinate Federal programs and ac-
15 tivities in support of STEM education, including at the
16 National Science Foundation, the Department of Energy,
17 the National Aeronautics and Space Administration, the
18 National Oceanic and Atmospheric Administration, the
19 Department of Education, and all other Federal agencies
20 that have programs and activities in support of STEM
21 education.

22 (d) **RESPONSIBILITIES OF THE COMMITTEE.**—The
23 committee established under subsection (c) shall—

24 (1) coordinate the STEM education activities
25 and programs of the Federal agencies;

- 1 (2) develop, implement through the partici-
2 pating agencies, and update once every 5 years a 5-
3 year STEM education strategic plan, which shall—
4 (A) specify and prioritize annual and long-
5 term objectives;
6 (B) specify the common metrics that will
7 be used to assess progress toward achieving the
8 objectives;
9 (C) describe the approaches that will be
10 taken by each participating agency to assess the
11 effectiveness of its STEM education programs
12 and activities; and
13 (D) with respect to subparagraph (A), de-
14 scribe the role of each agency in supporting
15 programs and activities designed to achieve the
16 objectives; and
17 (3) establish, periodically update, and maintain
18 an inventory of federally sponsored STEM education
19 programs and activities, including documentation of
20 assessments of the effectiveness of such programs
21 and activities and rates of participation by underrep-
22 resented minorities in such programs and activities.
23 (e) RESPONSIBILITIES OF OSTP.—The Director of
24 the Office of Science and Technology Policy shall encour-
25 age and monitor the efforts of the participating agencies

1 to ensure that the strategic plan under subsection (d)(2)
2 is developed and executed effectively and that the objec-
3 tives of the strategic plan are met.

4 (f) REPORT.—The Director of the Office of Science
5 and Technology Policy shall transmit a report annually to
6 Congress at the time of the President’s budget request de-
7 scribing the plan required under subsection (d)(2). The
8 annual report shall include—

9 (1) a description of the STEM education pro-
10 grams and activities for the previous and current fis-
11 cal years, and the proposed programs and activities
12 under the President’s budget request, of each par-
13 ticipating Federal agency;

14 (2) the levels of funding for each participating
15 Federal agency for the programs and activities de-
16 scribed under paragraph (1) for the previous fiscal
17 year and under the President’s budget request;

18 (3) except for the initial annual report, a de-
19 scription of the progress made in carrying out the
20 implementation plan, including a description of the
21 outcome of any program assessments completed in
22 the previous year, and any changes made to that
23 plan since the previous annual report; and

24 (4) a description of how the participating Fed-
25 eral agencies will disseminate information about fed-

1 erally supported resources for STEM education
2 practitioners, including teacher professional develop-
3 ment programs, to States and to STEM education
4 practitioners, including to teachers and administra-
5 tors in high-need schools, as defined in section 200
6 of the Higher Education Act of 1965 (20 U.S.C.
7 1021).

8 **SEC. 302. ADVISORY COMMITTEE ON STEM EDUCATION.**

9 (a) IN GENERAL.—The President shall establish or
10 designate an advisory committee on science, technology,
11 engineering, and mathematics (STEM) education.

12 (b) MEMBERSHIP.—The advisory committee estab-
13 lished or designated by the President under subsection (a)
14 shall be chaired by at least 2 members of the President’s
15 Council of Advisors on Science and Technology, with the
16 remaining advisory committee membership consisting of
17 non-Federal members who are specially qualified to pro-
18 vide the President with advice and information on STEM
19 education. Membership of the advisory committee, at a
20 minimum, shall include individuals from the following cat-
21 egories of individuals and organizations:

22 (1) STEM educator professional associations.

23 (2) Organizations that provide informal STEM
24 education activities.

25 (3) Institutions of higher education.

1 (4) Scientific and engineering professional soci-
2 eties.

3 (5) Business and industry associations.

4 (6) Foundations that fund STEM education ac-
5 tivities.

6 (c) RESPONSIBILITIES.—The responsibilities of the
7 advisory committee shall include—

8 (1) soliciting input from teachers, administra-
9 tors, local education agencies, States, and other pub-
10 lic and private STEM education stakeholder groups
11 for the purpose of informing the Federal agencies
12 that support STEM education programs on the
13 STEM education needs of States and school dis-
14 tricts;

15 (2) soliciting input from all STEM education
16 stakeholder groups regarding STEM education pro-
17 grams, including STEM education research pro-
18 grams, supported by Federal agencies;

19 (3) providing advice to the Federal agencies
20 that support STEM education programs on how
21 their programs can be better aligned with the needs
22 of States and school districts as identified in para-
23 graph (1), consistent with the mission of each agen-
24 cy; and

1 (4) offering guidance to the President on cur-
2 rent STEM education activities, research findings,
3 and best practices, with the purpose of increasing
4 connectivity between public and private STEM edu-
5 cation efforts.

6 **SEC. 303. STEM EDUCATION AT THE DEPARTMENT OF EN-**
7 **ERGY.**

8 (a) DEFINITIONS.—Section 5002 of the America
9 COMPETES Act (42 U.S.C. 16531) is amended—

10 (1) by redesignating paragraphs (2) through
11 (4) as paragraphs (3) through (5), respectively; and

12 (2) by inserting after paragraph (1) the fol-
13 lowing new paragraph:

14 “(2) ENERGY SYSTEMS SCIENCE AND ENGI-
15 NEERING.—The term ‘energy systems science and
16 engineering’ means—

17 “(A) nuclear science and engineering, in-
18 cluding—

19 “(i) nuclear engineering;

20 “(ii) nuclear chemistry;

21 “(iii) radiochemistry; and

22 “(iv) health physics;

23 “(B) hydrocarbon system science and engi-
24 neering, including—

- 1 “(i) petroleum or reservoir engineer-
2 ing;
3 “(ii) environmental geoscience;
4 “(iii) petrophysics;
5 “(iv) geophysics;
6 “(v) geochemistry;
7 “(vi) petroleum geology;
8 “(vii) ocean engineering; and
9 “(viii) environmental engineering;
10 “(C) energy efficiency and renewable en-
11 ergy technology systems science and engineer-
12 ing, including with respect to—
13 “(i) solar technology systems;
14 “(ii) wind technology systems;
15 “(iii) buildings technology systems;
16 “(iv) transportation technology sys-
17 tems;
18 “(v) hydropower systems; and
19 “(vi) geothermal systems; and
20 “(D) energy storage and distribution sys-
21 tems science and engineering, including with re-
22 spect to—
23 “(i) energy storage; and
24 “(ii) energy delivery.”.

1 (b) SCIENCE, TECHNOLOGY, ENGINEERING, AND
2 MATHEMATICS EDUCATION PROGRAMS.—Subpart B of
3 the Department of Energy Science Education Enhance-
4 ment Act (42 U.S.C. 7381g et seq.) is amended—

5 (1) in section 3170—

6 (A) by amending paragraph (1) to read as
7 follows:

8 “(1) DIRECTOR.—The term ‘Director’ means
9 the Director of STEM Education appointed or des-
10 ignated under section 3171(c)(1).”;

11 (B) by redesignating paragraph (2) as
12 paragraph (3);

13 (C) by inserting after paragraph (1) the
14 following new paragraph:

15 “(2) ENERGY SYSTEMS SCIENCE AND ENGI-
16 NEERING.—The term ‘energy systems science and
17 engineering’ means—

18 “(A) nuclear science and engineering, in-
19 cluding—

20 “(i) nuclear engineering;

21 “(ii) nuclear chemistry;

22 “(iii) radiochemistry; and

23 “(iv) health physics;

24 “(B) hydrocarbon system science and engi-
25 neering, including—

- 1 “(i) petroleum or reservoir engineer-
- 2 ing;
- 3 “(ii) environmental geoscience;
- 4 “(iii) petrophysics;
- 5 “(iv) geophysics;
- 6 “(v) geochemistry;
- 7 “(vi) petroleum geology;
- 8 “(vii) ocean engineering; and
- 9 “(viii) environmental engineering;
- 10 “(C) energy efficiency and renewable en-
- 11 ergy technology systems science and engineer-
- 12 ing, including with respect to—
- 13 “(i) solar technology systems;
- 14 “(ii) wind technology systems;
- 15 “(iii) buildings technology systems;
- 16 “(iv) transportation technology sys-
- 17 tems;
- 18 “(v) hydropower systems; and
- 19 “(vi) geothermal systems; and
- 20 “(D) energy storage and distribution sys-
- 21 tems science and engineering, including with re-
- 22 spect to—
- 23 “(i) energy storage; and
- 24 “(ii) energy delivery.”; and

1 (D) by adding at the end the following new
2 paragraph:

3 “(4) STEM.—The term ‘STEM’ means science,
4 technology, engineering, and mathematics.”;

5 (2) by striking chapters 1, 2, 3, 4, and 6;

6 (3) by inserting after section 3170 the following
7 new chapter:

8 **“CHAPTER 1—STEM EDUCATION**

9 **“SEC. 3171. STEM EDUCATION.**

10 “(a) IN GENERAL.—The Secretary of Energy shall
11 develop, conduct, support, promote, and coordinate formal
12 and informal educational activities that leverage the De-
13 partment’s unique content expertise and facilities to con-
14 tribute to improving STEM education at all levels in the
15 United States, and to enhance awareness and under-
16 standing of STEM, including energy sciences, in order to
17 create a diverse skilled scientific and technical workforce
18 essential to meeting the challenges facing the Department
19 and the Nation in the 21st century.

20 “(b) PROGRAMS.—The Secretary shall carry out evi-
21 dence-based programs designed to increase student inter-
22 est and participation, improve public literacy and support,
23 and improve the teaching and learning of energy systems
24 science and engineering and other STEM disciplines sup-

1 ported by the Department. Programs authorized under
2 this subsection may include—

3 “(1) informal educational programming de-
4 signed to excite and inspire students and the general
5 public about energy systems science and engineering
6 and other STEM disciplines supported by the De-
7 partment, while strengthening their content knowl-
8 edge in these fields;

9 “(2) teacher training and professional develop-
10 ment opportunities for pre-service and in-service ele-
11 mentary and secondary teachers designed to increase
12 the content knowledge of teachers in energy systems
13 science and engineering and other STEM disciplines
14 supported by the Department, including through
15 hands-on research experiences;

16 “(3) research opportunities for secondary school
17 students, including internships at the National Lab-
18 oratories, that provide secondary school students
19 with hands-on research experiences as well as expo-
20 sure to working scientists;

21 “(4) research opportunities at the National
22 Laboratories for undergraduate and graduate stu-
23 dents pursuing degrees in energy systems science
24 and engineering and other STEM disciplines sup-
25 ported by the Department; and

1 “(5) competitive scholarships, fellowships, and
2 traineeships for undergraduate and graduate stu-
3 dents in energy systems science and engineering and
4 other STEM disciplines supported by the Depart-
5 ment.

6 “(e) ORGANIZATION OF STEM EDUCATION PRO-
7 GRAMS.—

8 “(1) DIRECTOR OF STEM EDUCATION.—The
9 Secretary shall appoint or designate a Director of
10 STEM Education, who shall have the principal re-
11 sponsibility to oversee and coordinate all programs
12 and activities of the Department in support of
13 STEM education, including energy systems science
14 and engineering education, across all functions of
15 the Department.

16 “(2) QUALIFICATIONS.—The Director shall be
17 an individual, who by reason of professional back-
18 ground and experience, is specially qualified to ad-
19 vise the Secretary on all matters pertaining to
20 STEM education, including energy systems science
21 and engineering education, at the Department.

22 “(3) DUTIES.—The Director shall—

23 “(A) oversee and coordinate all programs
24 in support of STEM education, including en-

1 energy systems science and engineering education,
2 across all functions of the Department;

3 “(B) represent the Department as the
4 principal interagency liaison for all STEM edu-
5 cation programs, unless otherwise represented
6 by the Secretary, the Under Secretary for
7 Science, or the Under Secretary for Energy;

8 “(C) prepare the annual budget and advise
9 the Under Secretary for Science and the Under
10 Secretary for Energy on all budgetary issues for
11 STEM education, including energy systems
12 science and engineering education, relative to
13 the programs of the Department;

14 “(D) establish, periodically update, and
15 maintain a publicly accessible online inventory
16 of STEM education programs and activities, in-
17 cluding energy systems science and engineering
18 education programs and activities;

19 “(E) develop, implement, and update the
20 Department of Energy STEM education stra-
21 tegic plan, as required by subsection (d);

22 “(F) increase, to the maximum extent
23 practicable, the participation and advancement
24 of women and underrepresented minorities at
25 every level of STEM education, including en-

1 ergy systems science and engineering education;
2 and

3 “(G) perform such other matters relating
4 to STEM education as are required by the Sec-
5 retary, the Under Secretary for Science, or the
6 Under Secretary for Energy.

7 “(d) DEPARTMENT OF ENERGY STEM EDUCATION
8 STRATEGIC PLAN.—The Director of STEM education ap-
9 pointed or designated under subsection (c)(1) shall de-
10 velop, implement, and update once every 3 years a 3-year
11 STEM education strategic plan for the Department, which
12 shall—

13 “(1) identify and prioritize annual and long-
14 term STEM education goals and objectives for the
15 Department that are aligned with the overall goals
16 of the National Science and Technology Council
17 Committee on STEM Education Strategic plan re-
18 quired under section 301(d)(2) of the STEM Edu-
19 cation Coordination Act of 2010;

20 “(2) describe the role of each program or activ-
21 ity of the Department in contributing to the goals
22 and objectives identified under paragraph (1);

23 “(3) specify the metrics that will be used to as-
24 sess progress toward achieving those goals and ob-
25 jectives; and

1 “(4) describe the approaches that will be taken
2 to assess the effectiveness of each STEM education
3 program and activity supported by the Department.

4 “(e) OUTREACH TO STUDENTS FROM UNDERREP-
5 RESENTED GROUPS.—In carrying out a program author-
6 ized under this section, the Secretary shall give consider-
7 ation to the goal of promoting the participation of individ-
8 uals identified in section 33 or 34 of the Science and Engi-
9 neering Equal Opportunities Act (42 U.S.C. 1885a or
10 1885b).

11 “(f) CONSULTATION AND PARTNERSHIP WITH
12 OTHER AGENCIES.—In carrying out the programs and ac-
13 tivities authorized under this section, the Secretary shall—

14 “(1) consult with the Secretary of Education
15 and the Director of the National Science Foundation
16 regarding activities designed to improve elementary
17 and secondary STEM education; and

18 “(2) consult and partner with the Director of
19 the National Science Foundation in carrying out
20 programs under this section designed to build capac-
21 ity in STEM education at the undergraduate and
22 graduate level, including by supporting excellent pro-
23 posals in energy systems science and engineering
24 that are submitted for funding to the Foundation’s
25 Advanced Technological Education Program.”; and

- 1 (4) in section 3191—
- 2 (A) in subsection (a)—
- 3 (i) by striking “web-based” and in-
- 4 serting “, through a publicly available
- 5 website,” ; and
- 6 (ii) by inserting “and project-based
- 7 learning opportunities” after “laboratory
- 8 experiments”;
- 9 (B) in subsection (b)(1), by inserting “, in-
- 10 cluding energy systems science and engineer-
- 11 ing” after “the science of energy”; and
- 12 (C) by striking subsection (d).
- 13 (e) ENERGY APPLIED SCIENCE TALENT EXPANSION
- 14 PROGRAM FOR INSTITUTIONS OF HIGHER EDUCATION.—
- 15 Strike sections 5004 and 5005 of the America COM-
- 16 PETES Act (42 U.S.C. 16532 and 16533) and insert the
- 17 following new section:
- 18 **“SEC. 5004. ENERGY APPLIED SCIENCE TALENT EXPANSION**
- 19 **PROGRAM FOR INSTITUTIONS OF HIGHER**
- 20 **EDUCATION.**
- 21 “(a) PURPOSES.—The purposes of this section are—
- 22 “(1) to address the decline in the number of
- 23 and resources available to energy systems science
- 24 and engineering programs at institutions of higher
- 25 education, including community colleges; and

1 “(2) to increase the number of graduates with
2 degrees in energy systems science and engineering,
3 an area of strategic importance to the economic
4 competitiveness and energy security of the United
5 States.

6 “(b) ESTABLISHMENT.—The Secretary shall award
7 grants, on a competitive, merit-reviewed basis, to institu-
8 tions of higher education to implement or expand the en-
9 ergy systems science and engineering educational and
10 technical training capabilities of the institution, and to
11 provide merit-based financial support for master’s and
12 doctoral level students pursuing courses of study and re-
13 search in energy systems sciences and engineering.

14 “(c) USE OF FUNDS.—An institution of higher edu-
15 cation that receives a grant under this section may use
16 the grant to—

17 “(1) provide traineeships, including stipends
18 and cost of education allowances, to master’s and
19 doctoral students;

20 “(2) develop or expand multidisciplinary or
21 interdisciplinary courses or programs;

22 “(3) recruit and retain new faculty;

23 “(4) develop or improve core and specialized
24 course content;

1 “(5) encourage interdisciplinary and multidisci-
2 plinary research collaborations;

3 “(6) support outreach efforts to recruit stu-
4 dents, including individuals identified in section 33
5 or 34 of the Science and Engineering Equal Oppor-
6 tunities Act (42 U.S.C. 1885a or 1885b); and

7 “(7) pursue opportunities for collaboration with
8 industry and National Laboratories.

9 “(d) CRITERIA.—Criteria for awarding a grant under
10 this section shall be based on—

11 “(1) the potential to attract new students to the
12 program;

13 “(2) academic rigor; and

14 “(3) the ability to offer hands-on education and
15 training opportunities for graduate students in the
16 emerging areas of energy systems science and engi-
17 neering.

18 “(e) PRIORITY.—The Secretary shall give priority to
19 proposals that involve active partnerships with a National
20 Laboratory or other energy systems science and engineer-
21 ing related entity, as determined by the Secretary.

22 “(f) DURATION AND AMOUNT.—

23 “(1) DURATION.—A grant under this section
24 may be for up to 5 years in duration.

1 “(2) AMOUNT.—An institution of higher edu-
2 cation that receives a grant under this section shall
3 be eligible for up to \$1,000,000 for each year of the
4 grant period.

5 “(g) AUTHORIZATION OF APPROPRIATIONS.—There
6 are authorized to be appropriated to the Secretary to carry
7 out this section—

8 “(1) \$30,000,000 for fiscal year 2011;

9 “(2) \$32,000,000 for fiscal year 2012;

10 “(3) \$36,000,000 for fiscal year 2013;

11 “(4) \$38,000,000 for fiscal year 2014; and

12 “(5) \$40,000,000 for fiscal year 2015.”.

13 (d) DEPARTMENT OF ENERGY EARLY CAREER
14 AWARDS FOR SCIENCE, ENGINEERING, AND MATHE-
15 MATICS RESEARCHERS.—Section 5006 of the America
16 COMPETES Act (42 U.S.C. 16534) is amended—

17 (1) in subsection (a), by striking “Director of
18 the Office” and all that follows through “shall
19 carry” and inserting “Secretary shall carry”;

20 (2) in subsection (b)(1)—

21 (A) in subparagraph (A), by inserting “per
22 year” after “\$80,000”; and

23 (B) in subparagraph (B), by striking
24 “\$125,000” and inserting “\$175,000 per year”;

1 (3) in subsection (c)(1), by striking “, as deter-
2 mined by the Director”;

3 (4) in subsections (c)(2), (e), (f), and (g), by
4 striking “Director” each place it appears and insert-
5 ing “Secretary”;

6 (5) in subsection (d), by striking “merit-re-
7 viewed” and inserting “merit-based, peer reviewed”;
8 and

9 (6) in subsection (h)—

10 (A) by striking “, acting through the Di-
11 rector,”; and

12 (B) by striking “\$25,000,000 for each fis-
13 cal years 2008 through 2010” and inserting
14 “such sums as are necessary”.

15 (e) PROTECTING AMERICA’S COMPETITIVE EDGE
16 (PACE) GRADUATE FELLOWSHIP PROGRAM.—Section
17 5009 of the America COMPETES Act (42 U.S.C. 16536)
18 is amended—

19 (1) in subsection (c)—

20 (A) in paragraph (1), by striking “involv-
21 ing written and oral interviews, that will result
22 in a wide distribution of awards throughout the
23 United States,”; and

24 (B) in paragraph (2)(B)(iv), by striking
25 “verbal and”;

1 (2) in subsection (d)(1)(B)(i), by inserting
2 “partial or full” before “graduate tuition”; and
3 (3) by striking subsection (f).

4 (f) REPEAL.—Section 3164 of the Department of En-
5 ergy Science Education Enhancement Act (42 U.S.C.
6 7381a) is repealed.

7 **TITLE IV—NATIONAL INSTITUTE**
8 **OF STANDARDS AND TECH-**
9 **NOLOGY**

10 **SEC. 401. SHORT TITLE.**

11 This title may be cited as the “National Institute of
12 Standards and Technology Authorization Act of 2010”.

13 **SEC. 402. AUTHORIZATION OF APPROPRIATIONS.**

14 (a) FISCAL YEAR 2011.—

15 (1) IN GENERAL.—There are authorized to be
16 appropriated to the Secretary of Commerce
17 \$1,012,100,000 for the National Institute of Stand-
18 ards and Technology for fiscal year 2011.

19 (2) SPECIFIC ALLOCATIONS.—Of the amount
20 authorized under paragraph (1)—

21 (A) \$620,000,000 shall be authorized for
22 scientific and technical research and services
23 laboratory activities;

1 (B) \$125,000,000 shall be authorized for
2 the construction and maintenance of facilities;
3 and

4 (C) \$267,100,000 shall be authorized for
5 industrial technology services activities, of
6 which—

7 (i) \$116,000,000 shall be authorized
8 for the Technology Innovation Program
9 under section 28 of the National Institute
10 of Standards and Technology Act (15
11 U.S.C. 278n);

12 (ii) \$141,100,000 shall be authorized
13 for the Manufacturing Extension Partner-
14 ship program under sections 25 and 26 of
15 such Act (15 U.S.C. 278k and 278l); and

16 (iii) \$10,000,000 shall be authorized
17 for the Malcolm Baldrige National Quality
18 Award program under section 17 of the
19 Stevenson-Wydler Technology Innovation
20 Act of 1980 (15 U.S.C. 3711a).

21 (b) FISCAL YEAR 2012.—

22 (1) IN GENERAL.—There are authorized to be
23 appropriated to the Secretary of Commerce
24 \$1,035,400,000 for the National Institute of Stand-
25 ards and Technology for fiscal year 2012.

1 (2) SPECIFIC ALLOCATIONS.—Of the amount
2 authorized under paragraph (1)—

3 (A) \$657,200,000 shall be authorized for
4 scientific and technical research and services
5 laboratory activities;

6 (B) \$85,000,000 shall be authorized for
7 the construction and maintenance of facilities;
8 and

9 (C) \$293,200,000 shall be authorized for
10 industrial technology services activities, of
11 which—

12 (i) \$132,000,000 shall be authorized
13 for the Technology Innovation Program
14 under section 28 of the National Institute
15 of Standards and Technology Act (15
16 U.S.C. 278n);

17 (ii) \$150,900,000 shall be authorized
18 for the Manufacturing Extension Partner-
19 ship program under sections 25 and 26 of
20 such Act (15 U.S.C. 278k and 278l); and

21 (iii) \$10,300,000 shall be authorized
22 for the Malcolm Baldrige National Quality
23 Award program under section 17 of the
24 Stevenson-Wydler Technology Innovation
25 Act of 1980 (15 U.S.C. 3711a).

1 (e) FISCAL YEAR 2013.—

2 (1) IN GENERAL.—There are authorized to be
3 appropriated to the Secretary of Commerce
4 \$1,137,809,000 for the National Institute of Stand-
5 ards and Technology for fiscal year 2013.

6 (2) SPECIFIC ALLOCATIONS.—Of the amount
7 authorized under paragraph (1)—

8 (A) \$696,700,000 shall be authorized for
9 scientific and technical research and services
10 laboratory activities;

11 (B) \$122,000,000 shall be authorized for
12 the construction and maintenance of facilities;
13 and

14 (C) \$319,109,000 shall be authorized for
15 industrial technology services activities, of
16 which—

17 (i) \$147,000,000 shall be authorized
18 for the Technology Innovation Program
19 under section 28 of the National Institute
20 of Standards and Technology Act (15
21 U.S.C. 278n);

22 (ii) \$161,500,000 shall be authorized
23 for the Manufacturing Extension Partner-
24 ship program under sections 25 and 26 of
25 such Act (15 U.S.C. 278k and 278l); and

1 (iii) \$10,609,000 shall be authorized
2 for the Malcolm Baldrige National Quality
3 Award program under section 17 of the
4 Stevenson-Wydler Technology Innovation
5 Act of 1980 (15 U.S.C. 3711a).

6 (d) FISCAL YEAR 2014.—

7 (1) IN GENERAL.—There are authorized to be
8 appropriated to the Secretary of Commerce
9 \$1,188,277,000 for the National Institute of Stand-
10 ards and Technology for fiscal year 2014.

11 (2) SPECIFIC ALLOCATIONS.—Of the amount
12 authorized under paragraph (1)—

13 (A) \$738,500,000 shall be authorized for
14 scientific and technical research and services
15 laboratory activities;

16 (B) \$124,000,000 shall be authorized for
17 the construction and maintenance of facilities;
18 and

19 (C) \$325,727,000 shall be authorized for
20 industrial technology services activities, of
21 which—

22 (i) \$142,000,000 shall be authorized
23 for the Technology Innovation Program
24 under section 28 of the National Institute

1 of Standards and Technology Act (15
2 U.S.C. 278n);

3 (ii) \$172,800,000 shall be authorized
4 for the Manufacturing Extension Partner-
5 ship program under sections 25 and 26 of
6 such Act (15 U.S.C. 278k and 278l); and

7 (iii) \$10,927,000 shall be authorized
8 for the Malcolm Baldrige National Quality
9 Award program under section 17 of the
10 Stevenson-Wydler Technology Innovation
11 Act of 1980 (15 U.S.C. 3711a).

12 (e) FISCAL YEAR 2015.—

13 (1) IN GENERAL.—There are authorized to be
14 appropriated to the Secretary of Commerce
15 \$1,255,955,000 for the National Institute of Stand-
16 ards and Technology for fiscal year 2015.

17 (2) SPECIFIC ALLOCATIONS.—Of the amount
18 authorized under paragraph (1)—

19 (A) \$782,800,000 shall be authorized for
20 scientific and technical research and services
21 laboratory activities;

22 (B) \$133,000,000 shall be authorized for
23 the construction and maintenance of facilities;
24 and

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1 (C) \$340,155,000 shall be authorized for
2 industrial technology services activities, of
3 which—

4 (i) \$144,000,000 shall be authorized
5 for the Technology Innovation Program
6 under section 28 of the National Institute
7 of Standards and Technology Act (15
8 U.S.C. 278n);

9 (ii) \$184,900,000 shall be authorized
10 for the Manufacturing Extension Partner-
11 ship program under sections 25 and 26 of
12 such Act (15 U.S.C. 278k and 278l); and

13 (iii) \$11,255,000 shall be authorized
14 for the Malcolm Baldrige National Quality
15 Award program under section 17 of the
16 Stevenson-Wydler Technology Innovation
17 Act of 1980 (15 U.S.C. 3711a).

18 **SEC. 403. UNDER SECRETARY OF COMMERCE FOR STAND-**
19 **ARDS AND TECHNOLOGY.**

20 (a) ESTABLISHMENT.—Section 4 of the National In-
21 stitute of Standards and Technology Act is amended to
22 read as follows:

1 **“SEC. 4. UNDER SECRETARY OF COMMERCE FOR STAND-**
2 **ARDS AND TECHNOLOGY.**

3 “(a) ESTABLISHMENT.—There shall be in the De-
4 partment of Commerce an Under Secretary of Commerce
5 for Standards and Technology (in this section referred to
6 as the ‘Under Secretary’).

7 “(b) APPOINTMENT.—The Under Secretary shall be
8 appointed by the President by and with the advice and
9 consent of the Senate.

10 “(c) COMPENSATION.—The Under Secretary shall be
11 compensated at the rate in effect for level III of the Exec-
12 utive Schedule under section 5314 of title 5, United States
13 Code.

14 “(d) DUTIES.—The Under Secretary shall serve as
15 the Director of the Institute and shall perform such duties
16 as required of the Director by the Secretary under this
17 Act or by law.

18 “(e) APPLICABILITY.—The individual serving as the
19 Director of the Institute on the date of enactment of the
20 National Institute of Standards and Technology Author-
21 ization Act of 2010 shall also serve as the Under Secretary
22 until such time as a successor is appointed under sub-
23 section (b).”.

24 (b) CONFORMING AMENDMENTS.—

25 (1) TITLE 5, UNITED STATES CODE.—

1 (A) LEVEL III.—Section 5314 of title 5,
2 United States Code, is amended by inserting
3 before the item “Associate Attorney General”
4 the following:

5 “Under Secretary of Commerce for Standards
6 and Technology, who also serves as Director of the
7 National Institute of Standards and Technology.”.

8 (B) LEVEL IV.—Section 5315 of title 5,
9 United States Code, is amended by striking
10 “Director, National Institute of Standards and
11 Technology, Department of Commerce.”.

12 (2) NATIONAL INSTITUTE OF STANDARDS AND
13 TECHNOLOGY ACT.—Section 5 of the National Insti-
14 tute of Standards and Technology Act (15 U.S.C.
15 274) is amended by striking the first, fifth, and
16 sixth sentences.

17 **SEC. 404. REORGANIZATION OF NIST LABORATORIES.**

18 (a) ORGANIZATION.—The Director shall reorganize
19 the scientific and technical research and services labora-
20 tory program into the following operational units:

21 (1) The Physical Measurement Laboratory,
22 whose mission is to realize and disseminate the na-
23 tional standards for length, mass, time and fre-
24 quency, electricity, temperature, force, and radiation
25 by activities including fundamental research in

1 measurement science, the provision of measurement
2 services and standards, and the provision of testing
3 facilities resources for use by the Federal Govern-
4 ment.

5 (2) The Information Technology Laboratory,
6 whose mission is to develop and disseminate stand-
7 ards, measurements, and testing capabilities for
8 interoperability, security, usability, and reliability of
9 information technologies, including cyber security
10 standards and guidelines for Federal agencies,
11 United States industry, and the public, through fun-
12 damental and applied research in computer science,
13 mathematics, and statistics.

14 (3) The Engineering Laboratory, whose mission
15 is to develop and disseminate advanced manufac-
16 turing and construction technologies to the United
17 States manufacturing and construction industries
18 through activities including measurement science re-
19 search, performance metrics, tools for engineering
20 applications, promotion of green infrastructure, and
21 energy efficiency measurements and standards.

22 (4) The Material Measurement Laboratory,
23 whose mission is to serve as the national reference
24 laboratory in biological, chemical, and material
25 sciences and engineering through activities including

1 fundamental research in the composition, structure,
2 and properties of biological and environmental mate-
3 rials and processes, the development of certified ref-
4 erence materials and critically evaluated data, and
5 other programs to assure measurement quality in
6 materials and biotechnology fields.

7 (5) The Center for Nanoscale Science and
8 Technology, a national shared-use facility for
9 nanoscale fabrication and measurement, whose mis-
10 sion is to develop innovative nanoscale measurement
11 and fabrication capabilities to support researchers
12 from industry, institutions of higher education, the
13 National Institute of Standards and Technology, and
14 other Federal agencies in nanoscale technology from
15 discovery to production.

16 (6) The NIST Center for Neutron Research, a
17 national shared-use facility, whose mission is to pro-
18 vide neutron-based measurement capabilities to re-
19 searchers from industry, institutions of higher edu-
20 cation, the National Institute of Standards and
21 Technology, and other Federal agencies in support
22 of materials research, nondestructive evaluation,
23 neutron imaging, chemical analysis, neutron stand-
24 ards, dosimetry, and radiation metrology.

25 (b) REVISION.—

1 (1) IN GENERAL.—Subsequent to the reorga-
2 nization required under subsection (a), the Director
3 may revise the organization of the scientific and
4 technical research and services laboratory program.

5 (2) REPORT TO CONGRESS.—Any revision to
6 the organization of such program under paragraph
7 (1) shall be submitted in a report to the Committee
8 on Science and Technology of the House of Rep-
9 resentatives and the Committee on Commerce,
10 Science, and Transportation of the Senate at least
11 60 days before the effective date of such revision.

12 **SEC. 405. FEDERAL GOVERNMENT STANDARDS AND CON-**
13 **FORMITY ASSESSMENT COORDINATION.**

14 (a) COORDINATION.—Section 2(b) of the National In-
15 stitute of Standards and Technology Act (15 U.S.C.
16 272(b)) is amended—

17 (1) in paragraph (12), by striking “and” after
18 the semicolon;

19 (2) in paragraph (13), by striking the period at
20 the end and inserting a semicolon; and

21 (3) by adding after paragraph (13) the fol-
22 lowing:

23 “(14) to promote collaboration among Federal
24 departments and agencies and private sector stake-
25 holders in the development and implementation of

1 standards and conformity assessment frameworks to
2 address specific Federal Government policy goals;
3 and

4 “(15) to convene Federal departments and
5 agencies, as appropriate, to—

6 “(A) coordinate and determine Federal
7 Government positions on specific policy issues
8 related to international technical standards and
9 conformity assessment-related activities; and

10 “(B) coordinate Federal department and
11 agency engagement in the development of inter-
12 national technical standards and conformity as-
13 sessment-related activities.”.

14 (b) REPORT.—The Director, in consultation with ap-
15 propriate Federal agencies, shall submit a report annually
16 to Congress addressing the Federal Government’s tech-
17 nical standards and conformity assessment-related activi-
18 ties. The report shall identify—

19 (1) current and anticipated international stand-
20 ards and conformity assessment-related issues that
21 have the potential to impact the competitiveness and
22 innovation capabilities of the United States;

23 (2) any action being taken by the Federal Gov-
24 ernment to address these issues and the Federal
25 agency taking that action; and

1 (3) any action that the Director is taking or
 2 will take to ensure effective Federal Government en-
 3 gagement on technical standards and conformity as-
 4 sessment-related issues, as appropriate, where the
 5 Federal Government is not effectively engaged.

6 **SEC. 406. MANUFACTURING EXTENSION PARTNERSHIP.**

7 (a) COMMUNITY COLLEGE SUPPORT.—Section 25(a)
 8 of the National Institute of Standards and Technology Act
 9 (15 U.S.C. 278k(a)) is amended—

10 (1) in paragraph (4), by striking “and” after
 11 the semicolon;

12 (2) in paragraph (5), by striking the period at
 13 the end and inserting “; and”; and

14 (3) by adding after paragraph (5) the following:

15 “(6) providing to community colleges informa-
 16 tion about the job skills needed in small- and me-
 17 dium-sized manufacturing businesses in the regions
 18 they serve.”.

19 (b) INNOVATIVE SERVICES INITIATIVE.—Section 25
 20 of such Act (15 U.S.C. 278k) is amended by adding at
 21 the end the following:

22 “(g) INNOVATIVE SERVICES INITIATIVE.—

23 “(1) ESTABLISHMENT.—The Director may es-
 24 tablish, within the Centers program under this sec-

1 tion, an innovative services initiative to assist small-
2 and medium-sized manufacturers in—

3 “(A) reducing their energy usage and envi-
4 ronmental waste to improve profitability; and

5 “(B) accelerating the domestic commer-
6 cialization of new product technologies, includ-
7 ing components for renewable energy systems.

8 “(2) MARKET DEMAND.—The Director may not
9 undertake any activity to accelerate the domestic
10 commercialization of a new product technology
11 under this subsection unless an analysis of market
12 demand for the new product technology has been
13 conducted.”.

14 (c) REPORTS.—Section 25 of such Act (15 U.S.C.
15 278k) is further amended by adding after subsection (g),
16 as added by subsection (b), the following:

17 “(h) REPORTS.—

18 “(1) IN GENERAL.—In submitting the 3-year
19 programmatic planning document and annual up-
20 dates under section 23, the Director shall include an
21 assessment of the Director’s governance of the pro-
22 gram established under this section.

23 “(2) CRITERIA.—In conducting such assess-
24 ment, the Director shall use the criteria established
25 pursuant to the Malcolm Baldrige National Quality

1 Award under section 17(d)(1)(C) of the Stevenson-
2 Wydler Technology Innovation Act of 1980 (15
3 U.S.C. 3711a(d)(1)(C)).”.

4 (d) HOLLINGS MANUFACTURING EXTENSION PART-
5 NERSHIP PROGRAM COST-SHARING.—Section 25(e) of
6 such Act (15 U.S.C. 278k(e)) is amended by adding at
7 the end the following:

8 “(7) Notwithstanding paragraphs (1), (3), and
9 (5), for fiscal year 2011 through fiscal year 2015,
10 the Secretary may not provide to a Center more
11 than 50 percent of the costs incurred by such Center
12 and may not require that a Center’s cost share ex-
13 ceed 50 percent.

14 “(8) Not later than 4 years after the date of
15 enactment of the National Institute of Standards
16 and Technology Authorization Act of 2010, the Sec-
17 retary shall submit to Congress a report on the cost
18 share requirements under the program. The report
19 shall—

20 “(A) discuss various cost share structures,
21 including the cost share structure in place prior
22 to such date of enactment and the cost share
23 structure in place under paragraph (7), and the
24 effect of such cost share structures on indi-
25 vidual Centers and the overall program; and

1 “(B) include a recommendation for how
2 best to structure the cost share requirement
3 after fiscal year 2015 to provide for the long-
4 term sustainability of the program.”.

5 (e) ADVISORY BOARD.—Section 25(e)(4) of such Act
6 (15 U.S.C. 278k(e)(4)) is amended to read as follows:

7 “(4) FEDERAL ADVISORY COMMITTEE ACT AP-
8 PLICABILITY.—

9 “(A) IN GENERAL.—In discharging its du-
10 ties under this subsection, the MEP Advisory
11 Board shall function solely in an advisory ca-
12 pacity, in accordance with the Federal Advisory
13 Committee Act.

14 “(B) EXCEPTION.—Section 14 of the Fed-
15 eral Advisory Committee Act shall not apply to
16 the MEP Advisory Board.”.

17 (f) DEFINITIONS.—Section 25 of such Act (15 U.S.C.
18 278k) is further amended by adding after subsection (h),
19 as added by subsection (e), the following:

20 “(i) DEFINITION.—In this section, the term ‘commu-
21 nity college’ means an institution of higher education (as
22 defined under section 101(a) of the Higher Education Act
23 of 1965 (20 U.S.C. 1001(a))) at which the highest degree
24 that is predominately awarded to students is an associate’s
25 degree.”.

1 **SEC. 407. BIOSCIENCE RESEARCH PROGRAM.**

2 (a) IN GENERAL.—The National Institute of Stand-
3 ards and Technology Act (15 U.S.C. 271 et seq.) is
4 amended—

5 (1) by redesignating section 34 as section 35;

6 and

7 (2) by inserting after section 33 the following:

8 **“SEC. 34. BIOSCIENCE RESEARCH PROGRAM.**

9 “(a) IN GENERAL.—The Director shall establish a
10 bioscience research program to support research and de-
11 velopment of standard reference materials, measurements,
12 methods, and genomic and other data to advance—

13 “(1) biological drug research and development;

14 “(2) molecular diagnostics;

15 “(3) medical imaging technologies; and

16 “(4) personalized medicine.

17 “(b) UNIVERSITY RESEARCH CENTERS.—

18 “(1) ESTABLISHMENT.—The Director may es-
19 tablish research centers at institutions of higher edu-
20 cation (in this section referred to as ‘university re-
21 search centers’) through a competitive application
22 process to conduct research that furthers the objec-
23 tives of the bioscience research program.

24 “(2) APPLICATION.—

25 “(A) IN GENERAL.—An institution of high-
26 er education seeking to establish a university

1 research center under this subsection shall sub-
2 mit an application to the Director at such time,
3 in such manner, and containing such informa-
4 tion and assurances as the Director may re-
5 quire.

6 “(B) COMPONENTS.—The application shall
7 include, at a minimum, a description of—

8 “(i) the relevant research and instruc-
9 tional capacity of the applicant;

10 “(ii) the research projects that will be
11 undertaken by the applicant;

12 “(iii) the extent to which the applicant
13 will partner with industry and the role in-
14 dustry will play in the research undertaken
15 by the university research center;

16 “(iv) how the applicant will dissemi-
17 nate research results effectively; and

18 “(v) the metrics that will be used to
19 evaluate the success of the projects under
20 clause (ii) and the contribution of the uni-
21 versity research center in furthering the
22 objectives of the bioscience research pro-
23 gram.

24 “(C) SPECIAL CONSIDERATION.—The Di-
25 rector shall give special consideration to an ap-

1 plication from an institution of higher education
2 that is—

3 “(i) an 1890 Institution, as defined in
4 section 2 of the Agricultural Research, Ex-
5 tension, and Education Reform Act of
6 1998 (7 U.S.C. 7061);

7 “(ii) a Predominantly Black Institu-
8 tion, as defined in section 318 of the High-
9 er Education Act of 1965 (20 U.S.C.
10 1059e);

11 “(iii) a part B institution, as defined
12 in section 322 of the Higher Education
13 Act of 1965 (20 U.S.C. 1061);

14 “(iv) a Tribal College or University,
15 as defined in section 316 of the Higher
16 Education Act of 1965 (20 U.S.C. 1059e);

17 “(v) a Native American-serving, non-
18 tribal institution, as defined in section 319
19 of the Higher Education Act of 1965 (20
20 U.S.C. 1059f);

21 “(vi) an Asian American and Native
22 American Pacific Islander-serving institu-
23 tion, as defined in section 320 of the High-
24 er Education Act of 1965 (20 U.S.C.
25 1059g);

1 “(vii) an Alaska Native-serving insti-
2 tution, as defined in section 317 of the
3 Higher Education Act of 1965 (20 U.S.C.
4 1059d);

5 “(viii) a Native Hawaiian-serving in-
6 stitution, as defined in section 317 of the
7 Higher Education Act of 1965 (20 U.S.C.
8 1059d); or

9 “(ix) a Hispanic-serving institution,
10 as defined in section 502 of the Higher
11 Education Act of 1965 (20 U.S.C. 1101a).

12 “(3) ASSESSMENT.—Not later than 3 years
13 after the date on which a university research center
14 is established and every 3 years thereafter, the Di-
15 rector shall evaluate the university research center
16 for its contributions to the bioscience research pro-
17 gram.

18 “(4) ANNUAL MEETING.—If the Director estab-
19 lishes more than 1 university research center, the
20 Director shall convene an annual meeting of re-
21 searchers from all of the university research centers
22 and the Institute to foster collaboration and commu-
23 nication.

24 “(e) USER FACILITY.—The Director may establish a
25 bioscience user facility to provide access to advanced or

1 unique equipment, services, materials, and other resources
2 to industry, institutions of higher education, nonprofit or-
3 ganizations, and government agencies to perform research
4 and testing.

5 “(d) POSTDOCTORAL FELLOWS.—The Director shall,
6 to the extent practicable, assign 1 or more fellows from
7 the postdoctoral fellowship program established in section
8 19 to the bioscience research program.

9 “(e) PROGRAMMATIC PLANNING DOCUMENT.—The
10 Director shall ensure that the updates to the pro-
11 grammatic planning document transmitted to Congress
12 under section 23(d) include the bioscience research pro-
13 gram.

14 “(f) DEFINITIONS.—In this section:

15 “(1) BIOSCIENCE RESEARCH PROGRAM.—The
16 term ‘bioscience research program’ means the re-
17 search and development program authorized under
18 subsection (a).

19 “(2) INSTITUTION OF HIGHER EDUCATION.—
20 The term ‘institution of higher education’ has the
21 same meaning given the term in section 101(a) of
22 the Higher Education Act of 1965 (20 U.S.C.
23 1001(a)).”.

24 (b) VISITING COMMITTEE ON ADVANCED TECH-
25 NOLOGY AMENDMENTS.—Section 10 of the National Insti-

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1 tute of Standards and Technology Act (15 U.S.C. 278)
2 is amended—

3 (1) in subsection (a)—

4 (A) by striking “15 members” and insert-
5 ing “at least 15, but not more than 20, mem-
6 bers”; and

7 (B) by striking “at least 10” and inserting
8 “at least 13”; and

9 (2) in subsection (h)(1), by striking “Program
10 established under section 28” and inserting “pro-
11 grams established under sections 28 and 34”.

12 **SEC. 408. EMERGENCY COMMUNICATION AND TRACKING**
13 **TECHNOLOGIES RESEARCH INITIATIVE.**

14 (a) **ESTABLISHMENT.**—The Director shall establish a
15 research initiative to support the development of emer-
16 gency communication and tracking technologies for use in
17 locating trapped individuals in confined spaces, such as
18 underground mines, and other shielded environments,
19 such as high-rise buildings or collapsed structures, where
20 conventional radio communication is limited.

21 (b) **ACTIVITIES.**—In order to carry out this section,
22 the Director shall work with the private sector and appro-
23 priate Federal agencies to—

24 (1) perform a needs assessment to identify and
25 evaluate the measurement, technical standards, and

1 conformity assessment needs required to improve the
2 operation and reliability of such emergency commu-
3 nication and tracking technologies; and

4 (2) support the development of technical stand-
5 ards and conformance architecture to improve the
6 operation and reliability of such emergency commu-
7 nication and tracking technologies.

8 (c) REPORT.—Not later than 18 months after the
9 date of enactment of this Act, the Director shall submit
10 to Congress and make publicly available a report describ-
11 ing the assessment performed under subsection (b)(1) and
12 making recommendations about research priorities to ad-
13 dress gaps in the measurement, technical standards, and
14 conformity assessment needs identified by such assess-
15 ment.

16 **SEC. 409. TIP ADVISORY BOARD.**

17 Section 28(k)(4) of the National Institute of Stand-
18 ards and Technology Act (15 U.S.C. 278n(k)(4)) is
19 amended to read as follows:

20 “(4) FEDERAL ADVISORY COMMITTEE ACT AP-
21 PPLICABILITY.—

22 “(A) IN GENERAL.—In discharging its du-
23 ties under this subsection, the TIP Advisory
24 Board shall function solely in an advisory ca-

1 pacity, in accordance with the Federal Advisory
2 Committee Act.

3 “(B) EXCEPTION.—Section 14 of the Fed-
4 eral Advisory Committee Act shall not apply to
5 the TIP Advisory Board.”.

6 **SEC. 410. UNDERREPRESENTED MINORITIES.**

7 (a) RESEARCH FELLOWSHIPS.—Section 18 of the
8 National Institute of Standards and Technology Act (15
9 U.S.C. 278g-1) is amended by adding at the end the fol-
10 lowing:

11 “(c) UNDERREPRESENTED MINORITIES.—In evalu-
12 ating applications for fellowships under this section, the
13 Director shall give consideration to the goal of promoting
14 the participation of underrepresented minorities in re-
15 search areas supported by the Institute.”.

16 (b) POSTDOCTORAL FELLOWSHIP PROGRAM.—Sec-
17 tion 19 of such Act (15 U.S.C. 278g-2) is amended by
18 adding at the end the following: “In evaluating applica-
19 tions for fellowships under this section, the Director shall
20 give consideration to the goal of promoting the participa-
21 tion of underrepresented minorities in research areas sup-
22 ported by the Institute.”.

23 (c) TEACHER DEVELOPMENT.—Section 19A(e) of
24 such Act (15 U.S.C. 278g-2a(e)) is amended by adding
25 at the end the following: “The Director shall give special

1 consideration to an application from a teacher from a
2 high-need school, as defined in section 200 of the Higher
3 Education Act of 1965 (20 U.S.C. 1021).”.

4 **SEC. 411. CYBER SECURITY STANDARDS AND GUIDELINES.**

5 Cyber security standards and guidelines developed by
6 the National Institute of Standards and Technology for
7 use by United States industry and the public shall be vol-
8 untary.

9 **SEC. 412. DEFINITIONS.**

10 In this title:

11 (1) **DIRECTOR.**—The term “Director” means
12 the Director of the National Institute of Standards
13 and Technology.

14 (2) **FEDERAL AGENCY.**—The term “Federal
15 agency” has the meaning given such term in section
16 4 of the Stevenson-Wydler Technology Innovation
17 Act of 1980 (15 U.S.C. 3703).

18 **TITLE V—INNOVATION**

19 **SEC. 501. OFFICE OF INNOVATION AND ENTREPRENEUR-**
20 **SHIP.**

21 The Stevenson-Wydler Technology Innovation Act of
22 1980 (15 U.S.C. 3701 et seq.) is amended by adding at
23 the end the following new section:

1 **“SEC. 24. OFFICE OF INNOVATION AND ENTREPRENEUR-**
2 **SHIP.**

3 “(a) IN GENERAL.—The Secretary shall establish an
4 Office of Innovation and Entrepreneurship to foster inno-
5 vation and the commercialization of new technologies,
6 products, processes, and services with the goal of pro-
7 moting productivity and economic growth in the United
8 States.

9 “(b) DUTIES.—The Office of Innovation and Entre-
10 preneurship shall be responsible for—

11 “(1) developing and advocating policies to accel-
12 erate innovation and advance the commercialization
13 of research and development, including federally
14 funded research and development;

15 “(2) identifying existing barriers to innovation
16 and commercialization, including access to capital
17 and other resources, and ways to overcome those
18 barriers;

19 “(3) providing access to relevant data, research,
20 and technical assistance on innovation and commer-
21 cialization;

22 “(4) strengthening collaboration on and coordi-
23 nation of policies relating to innovation and commer-
24 cialization within the Department of Commerce and
25 between the Department of Commerce and other
26 Federal agencies, as appropriate; and

1 “(2) manufacture an innovative technology
2 product or an integral component of such product.

3 “(c) ELIGIBLE BORROWER.—A loan guarantee may
4 be made under such program only for a borrower who is
5 a small- or medium-sized manufacturer, as determined by
6 the Secretary under the criteria established pursuant to
7 subsection (m).

8 “(d) LIMITATION ON AMOUNT.—A loan guarantee
9 shall not exceed an amount equal to 80 percent of the obli-
10 gation, as estimated at the time at which the loan guar-
11 antee is issued.

12 “(e) LIMITATIONS ON LOAN GUARANTEE.—No loan
13 guarantee shall be made unless the Secretary determines
14 that—

15 “(1) there is a reasonable prospect of repay-
16 ment of the principal and interest on the obligation
17 by the borrower;

18 “(2) the amount of the obligation (when com-
19 bined with amounts available to the borrower from
20 other sources) is sufficient to carry out the project;

21 “(3) the obligation is not subordinate to other
22 financing;

23 “(4) the obligation bears interest at a rate that
24 does not exceed a level that the Secretary determines
25 appropriate, taking into account the prevailing rate

1 of interest in the private sector for similar loans and
2 risks; and

3 “(5) the term of an obligation requires full re-
4 payment over a period not to exceed the lesser of—

5 “(A) 30 years; or

6 “(B) 90 percent of the projected useful
7 life, as determined by the Secretary, of the
8 physical asset to be financed by the obligation.

9 “(f) DEFAULTS.—

10 “(1) PAYMENT BY SECRETARY.—

11 “(A) IN GENERAL.—If a borrower defaults
12 (as defined in regulations promulgated by the
13 Secretary and specified in the loan guarantee)
14 on the obligation, the holder of the loan guar-
15 antee shall have the right to demand payment
16 of the unpaid amount from the Secretary.

17 “(B) PAYMENT REQUIRED.—Within such
18 period as may be specified in the loan guar-
19 antee or related agreements, the Secretary shall
20 pay to the holder of the loan guarantee the un-
21 paid interest on and unpaid principal of the ob-
22 ligation as to which the borrower has defaulted,
23 unless the Secretary finds that there was no de-
24 fault by the borrower in the payment of interest

1 or principal or that the default has been rem-
2 edied.

3 “(C) FORBEARANCE.—Nothing in this sub-
4 section precludes any forbearance by the holder
5 of the obligation for the benefit of the borrower
6 which may be agreed upon by the parties to the
7 obligation and approved by the Secretary.

8 “(2) SUBROGATION.—

9 “(A) IN GENERAL.—If the Secretary
10 makes a payment under paragraph (1), the Sec-
11 retary shall be subrogated to the rights, as
12 specified in the loan guarantee, of the recipient
13 of the payment or related agreements including,
14 if appropriate, the authority (notwithstanding
15 any other provision of law) to—

16 “(i) complete, maintain, operate,
17 lease, or otherwise dispose of any property
18 acquired pursuant to such loan guarantee
19 or related agreement; or

20 “(ii) permit the borrower, pursuant to
21 an agreement with the Secretary, to con-
22 tinue to pursue the purposes of the project
23 if the Secretary determines that such an
24 agreement is in the public interest.

1 “(B) SUPERIORITY OF RIGHTS.—The
2 rights of the Secretary, with respect to any
3 property acquired pursuant to a loan guarantee
4 or related agreements, shall be superior to the
5 rights of any other person with respect to the
6 property.

7 “(3) ACTION BY ATTORNEY GENERAL.—

8 “(A) NOTIFICATION.—If the borrower de-
9 faults on an obligation, the Secretary shall no-
10 tify the Attorney General of the default.

11 “(B) RECOVERY.—On notification, the At-
12 torney General shall take such action as is ap-
13 propriate to recover the unpaid principal and
14 interest.

15 “(g) PAYMENT OF PRINCIPAL AND INTEREST BY
16 SECRETARY.—With respect to any obligation guaranteed
17 under this section, the Secretary may enter into a contract
18 to pay, and pay, holders of the obligation for and on behalf
19 of the borrower from funds appropriated for that purpose
20 the principal and interest payments that become due and
21 payable on the unpaid balance of the obligation if the Sec-
22 retary finds that—

23 “(1)(A) the borrower is unable to make the
24 payments and is not in default;

1 “(B) it is in the public interest to permit the
2 borrower to continue to pursue the project; and

3 “(C) the probable net benefit to the Federal
4 Government in paying the principal and interest will
5 be greater than that which would result in the event
6 of a default;

7 “(2) the amount of the payment that the Sec-
8 retary is authorized to pay shall be no greater than
9 the amount of principal and interest that the bor-
10 rower is obligated to pay under the obligation being
11 guaranteed; and

12 “(3) the borrower agrees to reimburse the Sec-
13 retary for the payment (including interest) on terms
14 and conditions that are satisfactory to the Secretary.

15 “(h) TERMS AND CONDITIONS.—A loan guarantee
16 under this section shall include such detailed terms and
17 conditions as the Secretary determines appropriate to—

18 “(1) protect the interests of the United States
19 in the case of default; and

20 “(2) have available all the patents and tech-
21 nology necessary for any person selected, including
22 the Secretary, to complete and operate the project.

23 “(i) CONSULTATION.—In establishing the terms and
24 conditions of a loan guarantee under this section, the Sec-
25 retary shall consult with the Secretary of the Treasury.

1 “(j) FEES.—

2 “(1) IN GENERAL.—The Secretary shall charge
3 and collect fees for loan guarantees in amounts the
4 Secretary determines are sufficient to cover applica-
5 ble administrative expenses.

6 “(2) AVAILABILITY.—Fees collected under this
7 subsection shall—

8 “(A) be deposited by the Secretary into the
9 Treasury of the United States; and

10 “(B) remain available until expended, sub-
11 ject to such other conditions as are contained in
12 annual appropriations Acts.

13 “(k) RECORDS.—

14 “(1) IN GENERAL.—With respect to a loan
15 guarantee under this section, the borrower, the lend-
16 er, and any other appropriate party shall keep such
17 records and other pertinent documents as the Sec-
18 retary shall prescribe by regulation, including such
19 records as the Secretary may require to facilitate an
20 effective audit.

21 “(2) ACCESS.—The Secretary and the Comp-
22 troller General of the United States, or their duly
23 authorized representatives, shall have access to
24 records and other pertinent documents for the pur-
25 pose of conducting an audit.

1 “(l) FULL FAITH AND CREDIT.—The full faith and
2 credit of the United States is pledged to the payment of
3 all loan guarantees issued under this section with respect
4 to principal and interest.

5 “(m) REGULATIONS.—The Secretary shall issue final
6 regulations before making any loan guarantees under the
7 program. Such regulations shall include—

8 “(1) criteria that the Secretary shall use to de-
9 termine eligibility for loan guarantees under this sec-
10 tion, including whether a borrower is a small- or me-
11 dium-sized manufacturer;

12 “(2) policies and procedures for selecting and
13 monitoring lenders and loan performance; and

14 “(3) any other policies, procedures, or informa-
15 tion necessary to implement this section.

16 “(n) AUDIT.—

17 “(1) ANNUAL INDEPENDENT AUDITS.—The
18 Secretary shall enter into an arrangement with an
19 independent auditor for annual evaluations of the
20 program under this section.

21 “(2) ANNUAL REVIEW.—The Comptroller Gen-
22 eral shall conduct an annual review of the Sec-
23 retary’s execution of the program under this section.

24 “(3) REPORT.—The results of the independent
25 audit under paragraph (1) and the Comptroller Gen-

1 eral's review under paragraph (2) shall be provided
2 directly to the Committee on Science and Tech-
3 nology of the House of Representatives and the
4 Committee on Commerce, Science, and Transpor-
5 tation of the Senate.

6 “(o) REPORT TO CONGRESS.—Concurrent with the
7 submission to Congress of the President's annual budget
8 request in each year after the date of enactment of this
9 section, the Secretary shall transmit to the Committee on
10 Science and Technology of the House of Representatives
11 and the Committee on Commerce, Science, and Transpor-
12 tation of the Senate a report containing a summary of
13 all activities carried out under this section.

14 “(p) COORDINATION AND NONDUPLICATION.—To
15 the maximum extent practicable, the Secretary shall en-
16 sure that the activities carried out under this section are
17 coordinated with, and do not duplicate the efforts of, other
18 loan guarantee programs within the Federal Government.

19 “(q) MEP CENTERS.—The Secretary may use cen-
20 ters established under section 25 of the National Institute
21 of Standards and Technology Act (15 U.S.C. 278k) to
22 provide information about the program established under
23 this section and to conduct outreach to potential bor-
24 rowers, as appropriate.

25 “(r) DEFINITIONS.—In this section:

1 “(1) COST.—The term ‘cost’ has the meaning
2 given such term under section 502 of the Federal
3 Credit Reform Act of 1990 (2 U.S.C. 661a).

4 “(2) INNOVATIVE PROCESS.—The term ‘innova-
5 tive process’ means a process that is significantly
6 improved as compared to the process in general use
7 in the commercial marketplace in the United States
8 at the time the loan guarantee is issued.

9 “(3) INNOVATIVE TECHNOLOGY.—The term ‘in-
10 novative technology’ means a technology that is sig-
11 nificantly improved as compared to the technology in
12 general use in the commercial marketplace in the
13 United States at the time the loan guarantee is
14 issued.

15 “(4) LOAN GUARANTEE.—The term ‘loan guar-
16 antee’ has the meaning given such term in section
17 502 of the Federal Credit Reform Act of 1990 (2
18 U.S.C. 661a). The term includes a loan guarantee
19 commitment (as defined in section 502 of such Act
20 (2 U.S.C. 661a)).

21 “(5) OBLIGATION.—The term ‘obligation’
22 means the loan or other debt obligation that is guar-
23 anteed under this section.

1 “(6) PROGRAM.—The term ‘program’ means
2 the loan guarantee program established in sub-
3 section (a).

4 “(s) AUTHORIZATION OF APPROPRIATIONS.—

5 “(1) COST OF LOAN GUARANTEES.—There are
6 authorized to be appropriated \$50,000,000 for each
7 of fiscal years 2011 through 2015 to provide the
8 cost of loan guarantees under this section.

9 “(2) PRINCIPAL AND INTEREST.—There are au-
10 thorized to be appropriated such sums as are nec-
11 essary to carry out subsection (g).”.

12 **SEC. 503. REGIONAL INNOVATION PROGRAM.**

13 The Stevenson-Wydler Technology Innovation Act of
14 1980 (15 U.S.C. 3701 et seq.) is further amended by add-
15 ing after section 25, as added by section 502 of this title,
16 the following new section:

17 **“SEC. 26. REGIONAL INNOVATION PROGRAM.**

18 “(a) ESTABLISHMENT.—The Secretary shall estab-
19 lish a regional innovation program to encourage and sup-
20 port the development of regional innovation strategies, in-
21 cluding regional innovation clusters.

22 “(b) REGIONAL INNOVATION CLUSTER GRANTS.—

23 “(1) IN GENERAL.—As part of the program es-
24 tablished under subsection (a), the Secretary may
25 award grants on a competitive basis to eligible re-

1 recipients for activities relating to the formation and
2 development of regional innovation clusters.

3 “(2) PERMISSIBLE ACTIVITIES.—Grants award-
4 ed under this subsection may be used for activities
5 determined appropriate by the Secretary, including
6 the following:

7 “(A) Feasibility studies.

8 “(B) Planning activities.

9 “(C) Technical assistance.

10 “(D) Developing or strengthening commu-
11 nication and collaboration between and among
12 participants of a regional innovation cluster.

13 “(E) Attracting additional participants to
14 a regional innovation cluster.

15 “(F) Facilitating market development of
16 products and services developed by a regional
17 innovation cluster, including through dem-
18 onstration, deployment, technology transfer,
19 and commercialization activities.

20 “(G) Developing relationships between a
21 regional innovation cluster and entities or clus-
22 ters in other regions.

23 “(3) ELIGIBLE RECIPIENT.—For purposes of
24 this subsection, the term ‘eligible recipient’ means
25 any of the following:

- 1 “(A) A State.
- 2 “(B) An Indian tribe.
- 3 “(C) A city or other political subdivision of
4 a State.
- 5 “(D) An entity that—
- 6 “(i) is a nonprofit organization, an in-
7 stitution of higher education, a public-pri-
8 vate partnership, or an economic develop-
9 ment organization or similar entity; and
- 10 “(ii) has an application that is sup-
11 ported by a State or a political subdivision
12 of a State.
- 13 “(E) A consortium of any of the entities
14 listed in subparagraphs (A) through (D).
- 15 “(4) APPLICATION.—
- 16 “(A) IN GENERAL.—An eligible recipient
17 shall submit an application to the Secretary at
18 such time, in such manner, and containing such
19 information and assurances as the Secretary
20 may require.
- 21 “(B) COMPONENTS.—The application shall
22 include, at a minimum, a description of the re-
23 gional innovation cluster supported by the pro-
24 posed activity, including a description of the fol-
25 lowing:

1 “(i) Whether the regional innovation
2 cluster is supported by the private sector,
3 State and local governments, and other rel-
4 evant stakeholders.

5 “(ii) How the existing participants in
6 the regional innovation cluster will encour-
7 age and solicit participation by all types of
8 entities that might benefit from partici-
9 tion, including newly formed entities and
10 those rival to existing participants.

11 “(iii) The extent to which the regional
12 innovation cluster is likely to stimulate in-
13 novation and have a positive impact on re-
14 gional economic growth and development.

15 “(iv) Whether the participants in the
16 regional innovation cluster have access to,
17 or contribute to, a well-trained workforce.

18 “(v) Whether the participants in the
19 regional innovation cluster are capable of
20 attracting additional funds from non-Fed-
21 eral sources.

22 “(vi) The likelihood that the partici-
23 pants in the regional innovation cluster will
24 be able to sustain activities once grant

1 funds under this subsection have been ex-
2 pended.

3 “(5) COST SHARE.—The Secretary may not
4 provide more than 50 percent of the total cost of
5 any activity funded under this subsection.

6 “(6) USE AND APPLICATION OF RESEARCH AND
7 INFORMATION PROGRAM.—To the maximum extent
8 practicable, the Secretary shall ensure that activities
9 funded under this subsection use and apply any rel-
10 evant research, best practices, and metrics developed
11 under the program established in subsection (c).

12 “(c) REGIONAL INNOVATION RESEARCH AND INFOR-
13 MATION PROGRAM.—

14 “(1) IN GENERAL.—As part of the program es-
15 tablished under subsection (a), the Secretary shall
16 establish a regional innovation research and infor-
17 mation program to—

18 “(A) gather, analyze, and disseminate in-
19 formation on best practices for regional innova-
20 tion strategies (including regional innovation
21 clusters), including information relating to how
22 innovation, productivity, and economic develop-
23 ment can be maximized through such strategies;

24 “(B) provide technical assistance, including
25 through the development of technical assistance

1 guides, for the development and implementation
2 of regional innovation strategies (including re-
3 gional innovation clusters);

4 “(C) support the development of relevant
5 metrics and measurement standards to evaluate
6 regional innovation strategies (including re-
7 gional innovation clusters), including the extent
8 to which such strategies stimulate innovation,
9 productivity, and economic development; and

10 “(D) collect and make available data on re-
11 gional innovation cluster activity in the United
12 States, including data on—

13 “(i) the size, specialization, and com-
14 petitiveness of regional innovation clusters;

15 “(ii) the regional domestic product
16 contribution, total jobs and earnings by
17 key occupations, establishment size, nature
18 of specialization, patents, Federal research
19 and development spending, and other rel-
20 evant information for regional innovation
21 clusters; and

22 “(iii) supply chain product and service
23 flows within and between regional innova-
24 tion clusters.

1 “(2) RESEARCH GRANTS.—The Secretary may
2 award research grants on a competitive basis to sup-
3 port and further the goals of the program estab-
4 lished under this subsection.

5 “(3) DISSEMINATION OF INFORMATION.—Data
6 and analysis compiled by the Secretary under the
7 program established in this subsection shall be made
8 available to other Federal agencies, State and local
9 governments, and nonprofit and for-profit entities.

10 “(4) CLUSTER GRANT PROGRAM.—The Sec-
11 retary shall incorporate data and analysis relating to
12 any regional innovation cluster supported by a grant
13 under subsection (b) into the program established
14 under this subsection.

15 “(d) INTERAGENCY COORDINATION.—

16 “(1) IN GENERAL.—To the maximum extent
17 practicable, the Secretary shall ensure that the ac-
18 tivities carried out under this section are coordinated
19 with, and do not duplicate the efforts of, other pro-
20 grams at the Department of Commerce or other
21 Federal agencies.

22 “(2) COLLABORATION.—The Secretary shall ex-
23 plore and pursue collaboration with other Federal
24 agencies, including through multiagency funding op-
25 portunities, on regional innovation strategies.

1 “(e) EVALUATION.—

2 “(1) IN GENERAL.—Not later than 4 years
3 after the date of enactment of this section, the Sec-
4 retary shall enter into a contract with an inde-
5 pendent entity, such as the National Academy of
6 Sciences, to conduct an evaluation of the program
7 established under subsection (a).

8 “(2) REQUIREMENTS.—The evaluation shall in-
9 clude—

10 “(A) whether such program is achieving its
11 goals;

12 “(B) any recommendations for how such
13 program may be improved; and

14 “(C) a recommendation as to whether such
15 program should be continued or terminated.

16 “(f) REGIONAL INNOVATION CLUSTER DEFINED.—
17 The term ‘regional innovation cluster’ means a geographi-
18 cally bounded network of similar, synergistic, or com-
19 plementary entities that—

20 “(1) are engaged in or with a particular indus-
21 try sector;

22 “(2) have active channels for business trans-
23 actions and communication;

24 “(3) share specialized infrastructure, labor mar-
25 kets, and services; and

1 “(4) leverage the region’s unique competitive
2 strengths to stimulate innovation and create jobs.

3 “(g) AUTHORIZATION OF APPROPRIATIONS.—There
4 are authorized to be appropriated such sums as are nec-
5 essary for each of fiscal years 2011 through 2015 to carry
6 out this section, including such sums as are necessary to
7 carry out the evaluation required under subsection (e).”.

8 **TITLE VI—DEPARTMENT OF**
9 **ENERGY**

10 **Subtitle A—Office of Science**

11 **SEC. 601. SHORT TITLE.**

12 This subtitle may be cited as the “Department of En-
13 ergy Office of Science Authorization Act of 2010”.

14 **SEC. 602. DEFINITIONS.**

15 Except as otherwise provided, in this subtitle:

16 (1) DEPARTMENT.—The term “Department”
17 means the Department of Energy.

18 (2) DIRECTOR.—The term “Director” means
19 the Director of the Office of Science.

20 (3) OFFICE OF SCIENCE.—The term “Office of
21 Science” means the Department of Energy Office of
22 Science.

23 (4) SECRETARY.—The term “Secretary” means
24 the Secretary of Energy.

1 **SEC. 603. MISSION OF THE OFFICE OF SCIENCE.**

2 (a) MISSION.—The mission of the Office of Science
3 shall be the delivery of scientific discoveries, capabilities,
4 and major scientific tools to transform the understanding
5 of nature and to advance the energy, economic, and na-
6 tional security of the United States.

7 (b) DUTIES.—In support of this mission, the Sec-
8 retary shall carry out, through the Office of Science, pro-
9 grams on basic energy sciences, biological and environ-
10 mental research, advanced scientific computing research,
11 fusion energy sciences, high energy physics, and nuclear
12 physics through activities focused on—

13 (1) Science for Discovery to unravel nature’s
14 mysteries through the study of subatomic particles,
15 atoms, and molecules that make up the materials of
16 our everyday world to DNA, proteins, cells, and en-
17 tire biological systems;

18 (2) Science for National Need by—

19 (A) advancing a clean energy agenda
20 through research on energy production, storage,
21 transmission, efficiency, and use; and

22 (B) advancing our understanding of the
23 Earth’s climate through research in atmos-
24 pheric and environmental sciences and climate
25 change; and

1 (3) National Scientific User Facilities to deliver
2 the 21st century tools of science, engineering, and
3 technology and provide the Nation's researchers with
4 the most advanced tools of modern science including
5 accelerators, colliders, supercomputers, light sources
6 and neutron sources, and facilities for studying the
7 nanoworld.

8 (c) SUPPORTING ACTIVITIES.—The activities de-
9 scribed in subsection (b) shall include providing for rel-
10 evant facilities and infrastructure, analysis, coordination,
11 and education and outreach activities.

12 (d) USER FACILITIES.—The Director shall carry out
13 the construction, operation, and maintenance of user fa-
14 cilities to support the activities described in subsection (b).
15 As practicable, these facilities shall serve the needs of the
16 Department, industry, the academic community, and other
17 relevant entities for the purposes of advancing the mis-
18 sions of the Department.

19 (e) OTHER AUTHORIZED ACTIVITIES.—In addition to
20 the activities authorized under this subtitle, the Office of
21 Science shall carry out such other activities it is author-
22 ized or required to carry out by law.

23 (f) COORDINATION AND JOINT ACTIVITIES.—The
24 Department's Under Secretary for Science shall ensure
25 the coordination of activities under this subtitle with the

1 other activities of the Department, and shall support joint
2 activities among the programs of the Department.

3 **SEC. 604. BASIC ENERGY SCIENCES PROGRAM.**

4 (a) PROGRAM.—As part of the activities authorized
5 under section 603, the Director shall carry out a program
6 in basic energy sciences, including materials sciences and
7 engineering, chemical sciences, physical biosciences, and
8 geosciences, for the purpose of providing the scientific
9 foundations for new energy technologies.

10 (b) BASIC ENERGY SCIENCES USER FACILITIES.—

11 (1) IN GENERAL.—The Director shall carry out
12 a program for the construction, operation, and main-
13 tenance of national user facilities to support the pro-
14 gram under this section. As practicable, these facili-
15 ties shall serve the needs of the Department, indus-
16 try, the academic community, and other relevant en-
17 tities to create and examine new materials and
18 chemical processes for the purposes of advancing
19 new energy technologies and improving the competi-
20 tiveness of the United States. These facilities shall
21 include—

22 (A) x-ray light sources;

23 (B) neutron sources;

24 (C) electron beam microcharacterization
25 centers;

1 (D) nanoscale science research centers;
2 and

3 (E) other facilities the Director considers
4 appropriate, consistent with section 603(d).

5 (2) FACILITY CONSTRUCTION AND UP-
6 GRADES.—Consistent with the Office of Science’s
7 project management practices, the Director shall
8 support construction of—

9 (A) the National Synchrotron Light Source
10 II;

11 (B) a Second Target Station at the Spall-
12 ation Neutron Source; and

13 (C) an upgrade of the Advanced Photon
14 Source to improve brightness and performance.

15 (e) ENERGY FRONTIER RESEARCH CENTERS.—

16 (1) IN GENERAL.—The Director shall carry out
17 a grant program to provide awards, on a competi-
18 tive, merit-reviewed basis, to multi-institutional col-
19 laborations or other appropriate entities to conduct
20 fundamental and use-inspired energy research to ac-
21 celerate scientific breakthroughs related to needs
22 identified in—

23 (A) the Grand Challenges report of the De-
24 partment’s Basic Energy Sciences Advisory
25 Committee;

1 (B) the Basic Energy Sciences Basic Re-
2 search Needs workshop reports;

3 (C) energy-related Grand Challenges for
4 Engineering, as described by the National
5 Academy of Engineering; or

6 (D) other relevant reports identified by the
7 Director.

8 (2) COLLABORATIONS.—A collaboration receiv-
9 ing a grant under this subsection may include mul-
10 tiple types of institutions and private sector entities.

11 (3) SELECTION AND DURATION.—

12 (A) IN GENERAL.—A collaboration under
13 this subsection shall be selected for a period of
14 5 years.

15 (B) REAPPLICATION.—After the end of the
16 period described in subparagraph (A), a grantee
17 may reapply for selection for a second period of
18 5 years on a competitive, merit-reviewed basis.

19 (4) NO FUNDING FOR CONSTRUCTION.—No
20 funding provided pursuant to this subsection may be
21 used for the construction of new buildings or facili-
22 ties.

23 (d) ACCELERATOR RESEARCH AND DEVELOP-
24 MENT.—The Director shall carry out research and devel-
25 opment on advanced accelerator technologies relevant to

1 the development of Basic Energy Sciences user facilities,
2 in consultation with the Office of Science's High Energy
3 Physics and Nuclear Physics programs.

4 **SEC. 605. BIOLOGICAL AND ENVIRONMENTAL RESEARCH**
5 **PROGRAM.**

6 (a) IN GENERAL.—As part of the activities author-
7 ized under section 603, and coordinated with the activities
8 authorized in section 604, the Director shall carry out a
9 program of research, development, and demonstration in
10 the areas of biological systems science and climate and en-
11 vironmental science to support the energy and environ-
12 mental missions of the Department.

13 (b) BIOLOGICAL SYSTEMS SCIENCE ACTIVITIES.—

14 (1) ACTIVITIES.—As part of the activities au-
15 thorized under subsection (a), the Director shall
16 carry out research, development, and demonstration
17 activities in fundamental, structural, computational,
18 and systems biology to increase systems-level under-
19 standing of complex biological systems, which shall
20 include activities to—

21 (A) accelerate breakthroughs and new
22 knowledge that will enable cost-effective sus-
23 tainable production of biomass-based liquid
24 transportation fuels, bioenergy, and biobased

1 products that support the energy and environ-
2 mental missions of the Department;

3 (B) improve understanding of the global
4 carbon cycle, including processes for removing
5 carbon dioxide from the atmosphere, through
6 photosynthesis and other biological processes,
7 for sequestration and storage; and

8 (C) understand the biological mechanisms
9 used to destroy, immobilize, or remove contami-
10 nants from subsurface environments.

11 (2) BIOENERGY RESEARCH CENTERS.—

12 (A) IN GENERAL.—In carrying out the ac-
13 tivities under paragraph (1), the Director shall
14 support at least 3 bioenergy research centers to
15 accelerate basic biological research, develop-
16 ment, demonstration, and commercial applica-
17 tion of biomass-based liquid transportation
18 fuels, bioenergy, and biobased products that
19 support the energy and environmental missions
20 of the Department and are produced from a va-
21 riety of regionally diverse feedstocks.

22 (B) GEOGRAPHIC DISTRIBUTION.—The Di-
23 rector shall ensure that the bioenergy research
24 centers under this paragraph are established in
25 geographically diverse locations.

1 (C) SELECTION AND DURATION.—A center
2 established under subparagraph (A) shall be se-
3 lected on a competitive, merit-reviewed basis for
4 a period of 5 years beginning on the date of es-
5 tablishment of that center. A center already in
6 existence on the date of enactment of this Act
7 may continue to receive support for a period of
8 5 years beginning on the date of establishment
9 of that center.

10 (3) ENABLING SYNTHETIC BIOLOGY PLAN.—

11 (A) IN GENERAL.—The Secretary, in con-
12 sultation with other relevant Federal agencies,
13 the academic community, research-based non-
14 profit entities, and the private sector, shall de-
15 velop a comprehensive plan for federally sup-
16 ported research and development activities that
17 will support the energy and environmental mis-
18 sions of the Department and enable a competi-
19 tive synthetic biology industry in the United
20 States.

21 (B) PLAN.—The plan developed under sub-
22 paragraph (A) shall assess the need to create a
23 database for synthetic biology information, the
24 need and process for developing standards for
25 biological parts, components and systems, and

1 the need for a federally funded facility that en-
2 ables the discovery, design, development, pro-
3 duction, and systematic use of parts, compo-
4 nents, and systems created through synthetic
5 biology. The plan shall describe the role of the
6 Federal Government in meeting these needs.

7 (C) SUBMISSION TO CONGRESS.—The Sec-
8 retary shall transmit the plan developed under
9 subparagraph (A) to the Congress not later
10 than 9 months after the date of enactment of
11 this Act.

12 (4) COMPUTATIONAL BIOLOGY AND SYSTEMS
13 BIOLOGY KNOWLEDGEBASE.—As part of the activi-
14 ties described in paragraph (1), the Director, in col-
15 laboration with the Office of Advanced Scientific
16 Computing Research described in section 606, shall
17 carry out research in computational biology, acquire
18 or otherwise ensure the availability of hardware for
19 biology-specific computation, and establish and
20 maintain an open virtual database and information
21 management system to centrally integrate systems
22 biology data, analytical software, and computational
23 modeling tools that will allow data sharing and free
24 information exchange within the scientific commu-
25 nity.

1 (5) PROHIBITION ON BIOMEDICAL AND HUMAN
2 CELL AND HUMAN SUBJECT RESEARCH.—

3 (A) NO BIOMEDICAL RESEARCH.—In car-
4 rying out activities under subsection (b), the
5 Director shall not conduct biomedical research.

6 (B) LIMITATIONS.—Nothing in subsection
7 (b) shall authorize the Director to conduct any
8 research or demonstrations—

9 (i) on human cells or human subjects;

10 or

11 (ii) designed to have direct application
12 with respect to human cells or human sub-
13 jects.

14 (C) INFORMATION SHARING.—Nothing in
15 this paragraph shall restrict the Department
16 from sharing information, including research
17 findings, research methodologies, models, or
18 any other information, with any Federal agen-
19 cy.

20 (6) REPEAL.—Section 977 of the Energy Policy
21 Act of 2005 (42 U.S.C. 16317) is repealed.

22 (c) CLIMATE AND ENVIRONMENTAL SCIENCES AC-
23 TIVITIES.—

24 (1) IN GENERAL.—As part of the activities au-
25 thorized under subsection (a), the Director shall

1 carry out climate and environmental science re-
2 search, which shall include activities to—

3 (A) understand, observe, and model the re-
4 sponse of the Earth's atmosphere and bio-
5 sphere, including oceans, to increased con-
6 centrations of greenhouse gas emissions, and
7 any associated changes in climate;

8 (B) understand the processes for seques-
9 tration, destruction, immobilization, or removal
10 of, and understand the movement of, contami-
11 nants and carbon in subsurface environments,
12 including at facilities of the Department; and

13 (C) inform potential mitigation and adap-
14 tation options for increased concentrations of
15 greenhouse gas emissions and any associated
16 changes in climate.

17 (2) SUBSURFACE BIOGEOCHEMISTRY RE-
18 SEARCH.—

19 (A) IN GENERAL.—As part of the activities
20 described in paragraph (1), the Director shall
21 carry out research to advance a fundamental
22 understanding of coupled physical, chemical,
23 and biological processes for controlling the
24 movement of sequestered carbon and subsurface
25 environmental contaminants, including field ob-

1 servations of subsurface microorganisms and
2 field-scale subsurface research.

3 (B) COORDINATION.—

4 (i) DIRECTOR.—The Director shall
5 carry out activities under this paragraph in
6 accordance with priorities established by
7 the Department's Under Secretary for
8 Science to support and accelerate the de-
9 contamination of relevant facilities man-
10 aged by the Department.

11 (ii) UNDER SECRETARY FOR
12 SCIENCE.—The Department's Under Sec-
13 retary for Science shall ensure the coordi-
14 nation of the activities of the Department,
15 including activities under this paragraph,
16 to support and accelerate the decontamina-
17 tion of relevant facilities managed by the
18 Department.

19 (3) NEXT-GENERATION ECOSYSTEM-CLIMATE
20 EXPERIMENT.—

21 (A) IN GENERAL.—As part of the activities
22 described in paragraph (1), the Director, in col-
23 laboration with other relevant agencies that are
24 participants in the United States Global
25 Change Research Program, shall carry out the

1 selection and development of a next-generation
2 ecosystem-climate change experiment to under-
3 stand the impact and feedbacks of increased
4 temperature and elevated carbon levels on eco-
5 systems.

6 (B) REPORT.—Not later than 1 year after
7 the date of enactment of this Act, the Director
8 shall transmit to the Congress a report con-
9 taining—

10 (i) an identification of the location or
11 locations that have been selected for the
12 experiment described in subparagraph (A);

13 (ii) a description of the need for addi-
14 tional experiments; and

15 (iii) an associated research plan.

16 (4) AMERIFLUX NETWORK COORDINATION AND
17 RESEARCH.—As part of the activities described in
18 paragraph (1), the Director shall carry out research
19 and coordinate the AmeriFlux Network to directly
20 observe and understand the exchange of greenhouse
21 gases, water vapor, and heat energy within terres-
22 trial ecosystems and the response of those systems
23 to climate change and other dynamic terrestrial
24 landscape changes. The Director, in collaboration
25 with other relevant Federal agencies, shall—

1 (A) identify opportunities to incorporate
2 innovative and emerging observation tech-
3 nologies and practices into the existing Net-
4 work;

5 (B) conduct research to determine the
6 need for increased greenhouse gas observation
7 Network facilities across North America to
8 meet future mitigation and adaptation needs of
9 the United States; and

10 (C) examine how the technologies and
11 practices described in subparagraph (A), and
12 increased coordination among scientific commu-
13 nities through the Network, have the potential
14 to help characterize terrestrial baseline green-
15 house gas emission sources and sinks in the
16 United States and internationally.

17 (5) REGIONAL AND GLOBAL CLIMATE MOD-
18 ELING.—As part of the activities described in para-
19 graph (1), the Director, in collaboration with the
20 Advanced Scientific Computing Research program
21 described in section 606, shall carry out research to
22 develop, evaluate, and use high-resolution regional
23 climate, global climate, Earth, and predictive models
24 to inform decisions on reducing the impacts of
25 changing climate.

1 (6) INTEGRATED ASSESSMENT RESEARCH.—As
2 part of the activities described in paragraph (1), the
3 Director shall carry out research into options for
4 mitigation of and adaptation to climate change
5 through multiscale models of the entire climate sys-
6 tem. Such modeling shall include human processes
7 and greenhouse gas emissions, land use, and inter-
8 action among human and Earth systems.

9 (7) COORDINATION.—The Director shall coordi-
10 nate activities under this subsection with other Of-
11 fice of Science activities and with the United States
12 Global Change Research Program.

13 (d) USER FACILITIES AND ANCILLARY EQUIP-
14 MENT.—

15 (1) IN GENERAL.—The Director shall carry out
16 a program for the construction, operation, and main-
17 tenance of user facilities to support the program
18 under this section. As practicable, these facilities
19 shall serve the needs of the Department, industry,
20 the academic community, and other relevant entities.

21 (2) INCLUDED FUNCTIONS.—User facilities de-
22 scribed in paragraph (1) shall include facilities which
23 carry out—

24 (A) genome sequencing and analysis of
25 plants, microbes, and microbial communities

1 using high throughput tools, technologies, and
2 comparative analysis;

3 (B) molecular level research in biological,
4 chemical, environmental, and subsurface
5 sciences, including synthesis, dynamic prop-
6 erties, and interactions among natural and en-
7 gineered materials; and

8 (C) measurement of cloud and aerosol
9 properties used for examining atmospheric proc-
10 esses and evaluating climate model perform-
11 ance, including ground stations at various loca-
12 tions, mobile resources, and aerial vehicles.

13 **SEC. 606. ADVANCED SCIENTIFIC COMPUTING RESEARCH**
14 **PROGRAM.**

15 (a) IN GENERAL.—As part of the activities author-
16 ized under section 603, the Director shall carry out a re-
17 search, development, demonstration, and commercial ap-
18 plication program to advance computational and net-
19 working capabilities to analyze, model, simulate, and pre-
20 dict complex phenomena relevant to the development of
21 new energy technologies and the competitiveness of the
22 United States.

23 (b) COORDINATION.—

24 (1) DIRECTOR.—The Director shall carry out
25 activities under this section in accordance with prior-

1 ities established by the Department's Under Sec-
2 retary for Science to determine and meet the com-
3 putational and networking research and facility
4 needs of the Office of Science and all other relevant
5 energy technology and energy efficiency programs
6 within the Department.

7 (2) UNDER SECRETARY FOR SCIENCE.—The
8 Department's Under Secretary for Science shall en-
9 sure the coordination of the activities of the Depart-
10 ment, including activities under this section, to de-
11 termine and meet the computational and networking
12 research and facility needs of the Office of Science
13 and all other relevant energy technology and energy
14 efficiency programs within the Department.

15 (c) RESEARCH TO SUPPORT ENERGY APPLICA-
16 TIONS.—As part of the activities authorized under sub-
17 section (a), the program shall support research in high-
18 performance computing and networking relevant to energy
19 applications, including both basic and applied energy re-
20 search programs carried out by the Secretary.

21 (d) REPORTS.—

22 (1) ADVANCED COMPUTING FOR ENERGY APPLI-
23 CATIONS.—Not later than one year after the date of
24 enactment of this Act, the Secretary shall transmit
25 to the Congress a plan to integrate and leverage the

1 expertise and capabilities of the program described
2 in subsection (a), as well as other relevant computa-
3 tional and networking research programs and re-
4 sources supported by the Federal Government, to
5 advance the missions of the Department's applied
6 energy and energy efficiency programs.

7 (2) EXASCALE COMPUTING.—At least 18
8 months prior to the initiation of construction or in-
9 stallation of any exascale-class computing facility,
10 the Secretary shall transmit a plan to the Congress
11 detailing—

12 (A) the proposed facility's cost projections
13 and capabilities to significantly accelerate the
14 development of new energy technologies;

15 (B) technical risks and challenges that
16 must be overcome to achieve successful comple-
17 tion and operation of the facility; and

18 (C) an assessment of the scientific and
19 technological advances expected from such a fa-
20 cility relative to those expected from a com-
21 parable investment in expanded research and
22 applications at terascale-class and petascale-
23 class computing facilities.

24 (e) APPLIED MATHEMATICS AND SOFTWARE DEVEL-
25 OPMENT FOR HIGH-END COMPUTING SYSTEMS.—The Di-

1 rector shall carry out activities to develop, test, and sup-
2 port mathematics, models, and algorithms for complex
3 systems, as well as programming environments, tools, lan-
4 guages, and operating systems for high-end computing
5 systems (as defined in section 2 of the Department of En-
6 ergy High-End Computing Revitalization Act of 2004 (15
7 U.S.C. 5541)).

8 (f) HIGH-END COMPUTING FACILITIES.—The Direc-
9 tor shall—

10 (1) provide for sustained access by the public
11 and private research community in the United
12 States to high-end computing systems, including ac-
13 cess to the National Energy Research Scientific
14 Computing Center and to Leadership Systems (as
15 defined in section 2 of the Department of Energy
16 High-End Computing Revitalization Act of 2004 (15
17 U.S.C. 5541));

18 (2) provide technical support for users of such
19 systems; and

20 (3) conduct research and development on next-
21 generation computing architectures and platforms to
22 support the missions of the Department.

23 (g) OUTREACH.—The Secretary shall conduct out-
24 reach programs and may form partnerships to increase the
25 use of and access to high-performance computing mod-

1 eling and simulation capabilities by industry, including
2 manufacturers.

3 **SEC. 607. FUSION ENERGY RESEARCH PROGRAM.**

4 (a) PROGRAM.—As part of the activities authorized
5 under section 603, the Director shall carry out a fusion
6 energy sciences research and enabling technology develop-
7 ment program to effectively address the scientific and en-
8 gineering challenges to building a cost-competitive fusion
9 power plant and a competitive fusion power industry in
10 the United States. As part of this program, the Director
11 shall carry out research activities to expand the funda-
12 mental understanding of plasmas and matter at very high
13 temperatures and densities.

14 (b) ITER.—The Director shall coordinate and carry
15 out the responsibilities of the United States with respect
16 to the ITER international fusion project pursuant to the
17 Agreement on the Establishment of the ITER Inter-
18 national Fusion Energy Organization for the Joint Imple-
19 mentation of the ITER Project.

20 (c) IDENTIFICATION OF PRIORITIES.—Not later than
21 18 months after the date of enactment of this Act, the
22 Secretary shall transmit to the Congress a report on the
23 Department's proposed research and development activi-
24 ties in magnetic fusion over the 10 years following the date

1 of enactment of this Act under four realistic budget sce-
2 narios. The report shall—

3 (1) identify specific areas of fusion energy re-
4 search and enabling technology development in
5 which the United States can and should establish or
6 solidify a lead in the global fusion energy develop-
7 ment effort; and

8 (2) identify priorities for initiation of facility
9 construction and facility decommissioning under
10 each of those scenarios.

11 (d) FUSION MATERIALS RESEARCH AND DEVELOP-
12 MENT.—The Director, in coordination with the Assistant
13 Secretary for Nuclear Energy of the Department, shall
14 carry out research and development activities to identify,
15 characterize, and create materials that can endure the
16 neutron, plasma, and heat fluxes expected in a commercial
17 fusion power plant. As part of the activities authorized
18 under subsection (c), the Secretary shall—

19 (1) provide an assessment of the need for a fa-
20 cility or facilities that can examine and test potential
21 fusion and next generation fission materials and
22 other enabling technologies relevant to the develop-
23 ment of commercial fusion power plants; and

24 (2) provide an assessment of whether a single
25 new facility that substantially addresses magnetic

1 fusion, inertial fusion, and next generation fission
2 materials research needs is feasible, in conjunction
3 with the expected capabilities of facilities operational
4 as of the date of enactment of this Act.

5 (e) FUSION SIMULATION PROJECT.—In collaboration
6 with the Office of Science’s Advanced Scientific Com-
7 puting Research program described in section 606, the Di-
8 rector shall carry out a computational project to advance
9 the capability of fusion researchers to accurately simulate
10 an entire fusion energy system.

11 (f) INERTIAL FUSION ENERGY RESEARCH AND DE-
12 VELOPMENT PROGRAM.—The Secretary shall carry out a
13 program of research and technology development in iner-
14 tial fusion for energy applications, including ion beam and
15 laser fusion. Not later than 180 days after the release of
16 a report from the National Academies on inertial fusion
17 energy research, the Secretary shall transmit to Congress
18 a report describing the Department’s plan to incorporate
19 any relevant recommendations from the National Acad-
20 emies’ report into this program.

21 **SEC. 608. HIGH ENERGY PHYSICS PROGRAM.**

22 (a) PROGRAM.—As part of the activities authorized
23 under section 603, the Director shall carry out a research
24 program on the elementary constituents of matter and en-
25 ergy and the nature of space and time.

1 (b) NEUTRINO RESEARCH.—As part of the program
2 described in subsection (a), the Director shall carry out
3 research activities on rare decay processes and the nature
4 of the neutrino, which may—

5 (1) include collaborations with the National
6 Science Foundation on relevant projects; and

7 (2) utilize components of existing accelerator
8 facilities to produce neutrino beams of sufficient in-
9 tensity to explore research priorities identified by the
10 High Energy Physics Advisory Panel or the National
11 Academy of Sciences.

12 (c) DARK ENERGY AND DARK MATTER RE-
13 SEARCH.—As part of the program described in subsection
14 (a), the Director shall carry out research activities on the
15 nature of dark energy and dark matter. These activities
16 shall be consistent with research priorities identified by
17 the High Energy Physics Advisory Panel or the National
18 Academy of Sciences, and may include—

19 (1) the development of space-based and land-
20 based facilities and experiments; and

21 (2) collaborations with the National Aeronautics
22 and Space Administration, the National Science
23 Foundation, or international collaborations on rel-
24 evant research projects.

1 (d) ACCELERATOR RESEARCH AND DEVELOP-
2 MENT.—The Director shall carry out research and devel-
3 opment in advanced accelerator concepts and technologies
4 to reduce the necessary scope and cost for the next genera-
5 tion of particle accelerators.

6 (e) INTERNATIONAL COLLABORATION.—The Direc-
7 tor, as practicable and in coordination with other appro-
8 priate Federal agencies as necessary, shall ensure the ac-
9 cess of United States researchers to the most advanced
10 accelerator facilities and research capabilities in the world,
11 including the Large Hadron Collider.

12 **SEC. 609. NUCLEAR PHYSICS PROGRAM.**

13 (a) PROGRAM.—As part of the activities authorized
14 under section 603, the Director shall carry out a research
15 program, and support relevant facilities, to discover and
16 understand various forms of nuclear matter.

17 (b) FACILITY CONSTRUCTION AND UPGRADES.—
18 Consistent with the Office of Science's project manage-
19 ment practices, the Director shall carry out—

20 (1) an upgrade of the Continuous Electron
21 Beam Accelerator Facility to a 12 gigaelectronvolt
22 beam of electrons; and

23 (2) construction of the Facility for Rare Isotope
24 Beams.

1 (c) ISOTOPE DEVELOPMENT AND PRODUCTION FOR
2 RESEARCH APPLICATIONS.—The Director shall carry out
3 a program for the production of isotopes, including the
4 development of techniques to produce isotopes, that the
5 Secretary determines are needed for research or other pur-
6 poses. In making this determination, the Secretary shall
7 consider any relevant recommendations made by Federal
8 advisory committees, the National Academies, and inter-
9 agency working groups in which the Department partici-
10 pates.

11 **SEC. 610. SCIENCE LABORATORIES INFRASTRUCTURE PRO-**
12 **GRAM.**

13 (a) PROGRAM.—The Director shall carry out a pro-
14 gram to improve the safety, efficiency, and mission readi-
15 ness of infrastructure at Office of Science laboratories.
16 The program shall include projects to—

- 17 (1) renovate or replace space that does not
18 meet research needs;
- 19 (2) replace facilities that are no longer cost ef-
20 fective to renovate or operate;
- 21 (3) modernize utility systems to prevent failures
22 and ensure efficiency;
- 23 (4) remove excess facilities to allow safe and ef-
24 ficient operations; and

1 (5) construct modern facilities to conduct ad-
2 vanced research in controlled environmental condi-
3 tions.

4 (b) MINOR CONSTRUCTION PROJECTS.—

5 (1) AUTHORITY.—Using operation and mainte-
6 nance funds or facilities and infrastructure funds
7 authorized by law, the Secretary may carry out
8 minor construction projects with respect to labora-
9 tories administered by the Office of Science.

10 (2) ANNUAL REPORT.—The Secretary shall
11 submit to Congress, as part of the annual budget
12 submission of the Department, a report on each ex-
13 ercise of the authority under subsection (a) during
14 the preceding fiscal year. Each report shall include
15 a summary of maintenance and infrastructure needs
16 and associated funding requirements at each of the
17 laboratories, including the amount of both planned
18 and deferred infrastructure spending at each labora-
19 tory. Each report shall provide a brief description of
20 each minor construction project covered by the re-
21 port.

22 (3) COST VARIATION REPORTS.—If, at any time
23 during the construction of any minor construction
24 project, the estimated cost of the project is revised
25 and the revised cost of the project exceeds the minor

1 construction threshold, the Secretary shall imme-
2 diately submit to Congress a report explaining the
3 reasons for the cost variation.

4 (4) DEFINITIONS.—In this section—

5 (A) the term “minor construction project”
6 means any plant project not specifically author-
7 ized by law for which the approved total esti-
8 mated cost does not exceed the minor construc-
9 tion threshold; and

10 (B) the term “minor construction thresh-
11 old” means \$10,000,000, with such amount to
12 be adjusted by the Secretary in accordance with
13 the Engineering News-Record Construction
14 Cost Index, or an appropriate alternative index
15 as determined by the Secretary, once every five
16 years after the date of enactment of this Act.

17 (5) NONAPPLICABILITY.—Sections 4703 and
18 4704 of the Atomic Energy Defense Act (50 U.S.C.
19 2743 and 2744) shall not apply to laboratories ad-
20 ministered by the Office of Science.

21 **SEC. 611. AUTHORIZATION OF APPROPRIATIONS.**

22 There are authorized to be appropriated to the Sec-
23 retary for the activities of the Office of Science—

24 (1) \$6,221,000,000 for fiscal year 2011, of
25 which—

1 (A) \$2,020,000,000 shall be for Basic En-
2 ergy Sciences activities under section 604;

3 (B) \$700,000,000 shall be for Biological
4 and Environmental Research activities under
5 section 605; and

6 (C) \$469,000,000 shall be for Advanced
7 Scientific Computing Research activities under
8 section 606;

9 (2) \$6,656,000,000 for fiscal year 2012, of
10 which—

11 (A) \$2,220,000,000 shall be for Basic En-
12 ergy Sciences activities under section 604;

13 (B) \$791,000,000 shall be for Biological
14 and Environmental Research activities under
15 section 605; and

16 (C) \$515,000,000 shall be for Advanced
17 Scientific Computing Research activities under
18 section 606;

19 (3) \$7,122,000,000 for fiscal year 2013, of
20 which—

21 (A) \$2,440,000,000 shall be for Basic En-
22 ergy Sciences activities under section 604;

23 (B) \$894,000,000 shall be for Biological
24 and Environmental Research activities under
25 section 605; and

1 (C) \$567,000,000 shall be for Advanced
2 Scientific Computing Research activities under
3 section 606;

4 (4) \$7,621,000,000 for fiscal year 2014, of
5 which—

6 (A) \$2,690,000,000 shall be for Basic En-
7 ergy Sciences activities under section 604;

8 (B) \$957,000,000 shall be for Biological
9 and Environmental Research activities under
10 section 605; and

11 (C) \$624,000,000 shall be for Advanced
12 Scientific Computing Research activities under
13 section 606; and

14 (5) \$8,154,000,000 for fiscal year 2015, of
15 which—

16 (A) \$2,960,000,000 shall be for Basic En-
17 ergy Sciences activities under section 604;

18 (B) \$1,060,000,000 shall be for Biological
19 and Environmental Research activities under
20 section 605; and

21 (C) \$686,000,000 shall be for Advanced
22 Scientific Computing Research activities under
23 section 606.

1 **Subtitle B—Advanced Research**
2 **Projects Agency-Energy**

3 **SEC. 621. SHORT TITLE.**

4 This subtitle may be cited as the “ARPA-E Reau-
5 thorization Act of 2010”.

6 **SEC. 622. ARPA-E AMENDMENTS.**

7 Section 5012 of the America COMPETES Act (42
8 U.S.C. 16538) is amended—

9 (1) in subsection (e)(2)—

10 (A) in subparagraph (A), by inserting
11 “and applied” after “advances in fundamental”;

12 (B) by striking “and” at the end of sub-
13 paragraph (B);

14 (C) by striking the period at the end of
15 subparagraph (C) and inserting “; and”; and

16 (D) by adding at the end the following new
17 subparagraph:

18 “(D) promoting the commercial application
19 of advanced energy technologies.”;

20 (2) in subsection (e)(3), by amending subpara-
21 graph (C) to read as follows:

22 “(C) research and development of ad-
23 vanced manufacturing process and technologies
24 for the domestic manufacturing of novel energy
25 technologies; and”;

1 (3) by redesignating subsections (f) through
2 (m) as subsections (g), (h), (i), (j), (l), (m), (n), and
3 (o), respectively;

4 (4) by inserting after subsection (e) the fol-
5 lowing new subsection:

6 “(f) AWARDS.—In carrying out this section, the Di-
7 rector shall initiate and execute awards in the form of
8 grants, contracts, cooperative agreements, cash prizes,
9 and other transactions.”;

10 (5) in subsection (g), as so redesignated by
11 paragraph (3) of this section—

12 (A) by redesignating paragraphs (1) and
13 (2) as paragraphs (2) and (3), respectively;

14 (B) by inserting before paragraph (2), as
15 so redesignated by subparagraph (A) of this
16 paragraph, the following new paragraph:

17 “(1) IN GENERAL.—The Director shall establish
18 and maintain within ARPA-E a staff, including legal
19 counsel, contracting personnel, and program direc-
20 tors, with sufficient qualifications and expertise to
21 enable ARPA-E to carry out its responsibilities
22 under this section separate and distinct from the op-
23 erations of the rest of the Department.”;

1 (C) in paragraph (2)(A), as so redesign-
2 nated by subparagraph (A) of this paragraph,
3 by striking “each of”;

4 (D) in paragraph (2)(B), as so redesign-
5 nated by subparagraph (A) of this paragraph—

6 (i) in clause (iv), by striking “, with
7 advice under subsection (j) as appro-
8 priate,”;

9 (ii) by redesignating clauses (v) and
10 (vi) as clauses (vi) and (viii), respectively;

11 (iii) by inserting after clause (iv) the
12 following new clause:

13 “(v) identifying innovative cost-shar-
14 ing arrangements for ARPA-E projects, in-
15 cluding through use of the authority under
16 section 988(b)(3) of the Energy Policy Act
17 of 2005 (42 U.S.C. 16352(b)(3));”;

18 (iv) in clause (vi), as so redesignated
19 by clause (ii) of this subparagraph, by
20 striking “; and” and inserting a semicolon;
21 and

22 (v) by inserting after clause (vi), as so
23 redesignated by clause (ii) of this subpara-
24 graph, the following new clause:

1 “(vii) identifying mechanisms for com-
2 mercial application of successful energy
3 technology development projects, including
4 through establishment of partnerships be-
5 tween awardees and commercial entities;
6 and”;

7 (E) in paragraph (2)(C), as so redesign-
8 nated by subparagraph (A) of this paragraph,
9 by inserting “up to” after “shall be”;

10 (F) in paragraph (3), as so redesignated
11 by subparagraph (A) of this paragraph, by
12 striking subparagraph (B) and redesignating
13 subparagraphs (C) and (D) as subparagraphs
14 (B) and (C), respectively;

15 (G) by striking “program managers” each
16 place it appears and inserting “program direc-
17 tors”;

18 (H) by striking “program manager” each
19 place it appears and inserting “program direc-
20 tor”; and

21 (I) by adding at the end the following new
22 paragraph:

23 “(4) FELLOWSHIPS.—The Director is author-
24 ized to select exceptional early-career and senior sci-
25 entific, legal, business, and technical personnel to

1 serve as fellows to work at ARPA-E for terms not
2 to exceed two years. Responsibilities of fellows may
3 include—

4 “(A) supporting program managers in pro-
5 gram creation, design, implementation, and
6 management;

7 “(B) exploring technical fields for future
8 ARPA-E program areas;

9 “(C) assisting the Director in the creation
10 of the strategic vision for ARPA-E referred to
11 in subsection (h)(2);

12 “(D) preparing energy technology and eco-
13 nomic analyses; and

14 “(E) any other appropriate responsibilities
15 identified by the Director.”;

16 (6) in subsection (h)(2), as so redesignated by
17 paragraph (3) of this section—

18 (A) by striking “2008” and inserting
19 “2010”; and

20 (B) by striking “2011” and inserting
21 “2013”;

22 (7) by amending subsection (j), as so redesign-
23 ated by paragraph (3) of this section, to read as
24 follows:

1 “(j) FEDERAL DEMONSTRATION OF TECH-
2 NOLOGIES.—The Director shall seek opportunities to part-
3 ner with purchasing and procurement programs of Federal
4 agencies to demonstrate energy technologies resulting
5 from activities funded through ARPA-E.”;

6 (8) by inserting after such subsection (j) the
7 following new subsection:

8 “(k) EVENTS.—The Director is authorized to con-
9 vene, organize, and sponsor events that further the objec-
10 tives of ARPA-E, including events that assemble award-
11 ees, the most promising applicants for ARPA-E funding,
12 and a broad range of ARPA-E stakeholders (which may
13 include members of relevant scientific research and aca-
14 demic communities, government officials, financial institu-
15 tions, private investors, entrepreneurs, and other private
16 entities), for the purposes of—

17 “(1) demonstrating projects of ARPA-E award-
18 ees;

19 “(2) demonstrating projects of finalists for
20 ARPA-E awards and other energy technology
21 projects;

22 “(3) facilitating discussion of the commercial
23 application of energy technologies developed under
24 ARPA-E and other government-sponsored research
25 and development programs; or

1 “(4) such other purposes as the Director con-
2 siders appropriate.”;

3 (9) in subsection (m)(1), as so redesignated by
4 paragraph (3) of this section, by striking “4 years”
5 and inserting “6 years”;

6 (10) in subsection (m)(2)(B), as so redesign-
7 ated by paragraph (3) of this section, by inserting
8 “, and how those lessons may apply to the operation
9 of other programs within the Department of En-
10 ergy” after “ARPA-E”;

11 (11) by amending subsection (o)(2), as so re-
12 designated by paragraph (3) of this section, to read
13 as follows:

14 “(2) AUTHORIZATION OF APPROPRIATIONS.—
15 Subject to paragraph (4), there are authorized to be
16 appropriated to the Director for deposit in the
17 Fund, without fiscal year limitation—

18 “(A) \$300,000,000 for fiscal year 2011;

19 “(B) \$500,000,000 for fiscal year 2012;

20 “(C) \$700,000,000 for fiscal year 2013;

21 “(D) \$900,000,000 for fiscal year 2014;

22 “(E) \$1,000,000,000 for fiscal year 2015;

23 and

24 “(F) such sums as are necessary for each
25 of fiscal years 2016 through 2020.”;

1 (12) in subsection (o), as so redesignated by
2 paragraph (3) of this section, by—

3 (A) striking paragraph (4); and

4 (B) redesignated paragraph (5) as para-
5 graph (4); and

6 (13) in subsection (o)(4)(B), as so redesignated
7 by paragraphs (3) and (12)(B) of this subsection—

8 (A) by striking “2.5 percent” and inserting
9 “5 percent”; and

10 (B) by inserting “, consistent with the goal
11 described in subsection (e)(2)(D) and within the
12 responsibilities of program directors as specified
13 in subsection (g)(2)(B)(vii)” after “outreach ac-
14 tivities”.

15 **Subtitle C—Energy Innovation** 16 **Hubs**

17 **SEC. 631. SHORT TITLE.**

18 This subtitle may be cited as the “Energy Innovation
19 Hubs Authorization Act of 2010”.

20 **SEC. 632. ENERGY INNOVATION HUBS.**

21 (a) ESTABLISHMENT OF PROGRAM.—

22 (1) IN GENERAL.—The Secretary of Energy
23 shall carry out a program to enhance the Nation’s
24 economic, environmental, and energy security by
25 making grants to consortia for establishing and op-

1 erating Energy Innovation Hubs to conduct and
2 support, whenever practicable at one centralized lo-
3 cation, multidisciplinary, collaborative research, de-
4 velopment, demonstration, and commercial applica-
5 tion of advanced energy technologies in areas not
6 being served by the private sector.

7 (2) TECHNOLOGY DEVELOPMENT FOCUS.—The
8 Secretary shall designate for each Hub a unique ad-
9 vanced energy technology development focus.

10 (3) COORDINATION.—The Secretary shall en-
11 sure the coordination of, and avoid unnecessary du-
12 plication of, the activities of Hubs with those of
13 other Department of Energy research entities, in-
14 cluding the National Laboratories, the Advanced Re-
15 search Projects Agency—Energy, and Energy Fron-
16 tier Research Centers, and within industry. Such co-
17 ordination shall include convening and consulting
18 with representatives of staff of the Department of
19 Energy, representatives from Hubs and the quali-
20 fying entities that are members of the consortia op-
21 erating the Hubs, and representatives of such other
22 entities as the Secretary considers appropriate, to
23 share research results, program plans, and opportu-
24 nities for collaboration.

1 (4) ADMINISTRATION.—The Secretary shall ad-
2 minister this section with respect to each Hub
3 through the Department program office appropriate
4 to administer the subject matter of the technology
5 development focus assigned under paragraph (2) for
6 the Hub.

7 (b) CONSORTIA.—

8 (1) ELIGIBILITY.—To be eligible to receive a
9 grant under this section for the establishment and
10 operation of a Hub, a consortium shall—

11 (A) be composed of no fewer than 2 quali-
12 fying entities;

13 (B) operate subject to a binding agreement
14 entered into by its members that documents—

15 (i) the proposed partnership agree-
16 ment, including the governance and man-
17 agement structure of the Hub;

18 (ii) measures to enable cost-effective
19 implementation of the program under this
20 section;

21 (iii) a proposed budget, including fi-
22 nancial contributions from non-Federal
23 sources;

24 (iv) conflict of interest procedures
25 consistent with subsection (d)(3), all

1 known material conflicts of interest, and
2 corresponding mitigation plans;

3 (v) an accounting structure that en-
4 ables the Secretary to ensure that the con-
5 sortium has complied with the require-
6 ments of this section; and

7 (vi) an external advisory committee
8 consistent with subsection (d)(2); and

9 (C) operate as a nonprofit organization.

10 (2) APPLICATION.—A consortium seeking to es-
11 tablish and operate a Hub under this section, acting
12 through a prime applicant, shall transmit to the Sec-
13 retary an application at such time, in such form,
14 and accompanied by such information as the Sec-
15 retary shall require, including a detailed description
16 of the elements of the consortium agreement re-
17 quired under paragraph (1)(B). If the consortium
18 members will not be located at one centralized loca-
19 tion, such application shall include a communica-
20 tions plan that ensures close coordination and inte-
21 gration of the Hub's activities.

22 (c) SELECTION AND SCHEDULE.—The Secretary
23 shall select consortia for grants for the establishment and
24 operation of Hubs through competitive selection processes.
25 Grants made to a Hub shall be for a period not to exceed

1 5 years, after which the grant may be renewed, subject
2 to a competitive selection process.

3 (d) HUB OPERATIONS.—

4 (1) IN GENERAL.—Hubs shall conduct or pro-
5 vide for multidisciplinary, collaborative research, de-
6 velopment, demonstration, and commercial applica-
7 tion of advanced energy technologies within the tech-
8 nology development focus designated for the Hub by
9 the Secretary under subsection (a)(2). Each Hub
10 shall—

11 (A) encourage collaboration and commu-
12 nication among the member qualifying entities
13 of the consortium and awardees by conducting
14 activities whenever practicable at one central-
15 ized location;

16 (B) develop and publish on the Depart-
17 ment of Energy's website proposed plans and
18 programs;

19 (C) submit an annual report to the Sec-
20 retary summarizing the Hub's activities, includ-
21 ing detailing organizational expenditures, listing
22 external advisory committee members, and de-
23 scribing each project undertaken by the Hub;
24 and

1 (D) monitor project implementation and
2 coordination.

3 (2) EXTERNAL ADVISORY COMMITTEE.—Each
4 Hub shall establish an external advisory committee,
5 the membership of which shall have sufficient exper-
6 tise to advise and provide guidance on scientific,
7 technical, industry, financial, and research manage-
8 ment matters.

9 (3) CONFLICTS OF INTEREST.—

10 (A) PROCEDURES.—Hubs shall establish
11 conflict of interest procedures, consistent with
12 those of the Department of Energy, to ensure
13 that employees and consortia designees for Hub
14 activities who are in decisionmaking capacities
15 disclose all material conflicts of interest, includ-
16 ing financial, organizational, and personal con-
17 flicts of interest.

18 (B) DISQUALIFICATION AND REVOCA-
19 TION.—The Secretary may disqualify an appli-
20 cation or revoke funds distributed to a Hub if
21 the Secretary discovers a failure to comply with
22 conflict of interest procedures established under
23 subparagraph (A).

24 (e) PROHIBITION ON CONSTRUCTION.—

1 (1) IN GENERAL.—No funds provided pursuant
2 to this section may be used for construction of new
3 buildings or facilities for Hubs. Construction of new
4 buildings or facilities shall not be considered as part
5 of the non-Federal share of a Hub cost-sharing
6 agreement.

7 (2) TEST BED AND RENOVATION EXCEPTION.—
8 Nothing in this subsection shall prohibit the use of
9 funds provided pursuant to this section, or non-Fed-
10 eral cost share funds, for the construction of a test
11 bed or renovations to existing buildings or facilities
12 for the purposes of research if the Oversight Board
13 determines that the test bed or renovations are lim-
14 ited to a scope and scale necessary for the research
15 to be conducted.

16 (f) OVERSIGHT BOARD.—The Secretary shall estab-
17 lish and maintain within the Department an Oversight
18 Board to oversee the progress of Hubs.

19 (g) DEFINITIONS.—For purposes of this section:

20 (1) ADVANCED ENERGY TECHNOLOGY.—The
21 term “advanced energy technology” means an inno-
22 vative technology—

23 (A) that produces energy from solar, wind,
24 geothermal, biomass, tidal, wave, ocean, or
25 other renewable energy resources;

- 1 (B) that produces nuclear energy;
- 2 (C) for carbon capture and sequestration;
- 3 or
- 4 (D) that generates, transmits, distributes,
- 5 utilizes, or stores energy more efficiently than
- 6 conventional technologies.
- 7 (2) HUB.—The term “Hub” means an Energy
- 8 Innovation Hub established in accordance with this
- 9 section.
- 10 (3) INSTITUTION OF HIGHER EDUCATION.—The
- 11 term “institution of higher education” has the
- 12 meaning given that term in section 101(a) of the
- 13 Higher Education Act of 1965 (20 U.S.C. 1001(a)).
- 14 (4) QUALIFYING ENTITY.—The term “quali-
- 15 fying entity” means—
- 16 (A) an institution of higher education;
- 17 (B) an appropriate State or Federal entity;
- 18 (C) a nongovernmental organization with
- 19 expertise in advanced energy technology re-
- 20 search, development, demonstration, or com-
- 21 mercial application; or
- 22 (D) any other relevant entity the Secretary
- 23 considers appropriate.
- 24 (5) SECRETARY.—The term “Secretary” means
- 25 the Secretary of Energy.

1 (h) AUTHORIZATION OF APPROPRIATIONS.—There
2 are authorized to be appropriated to the Secretary to carry
3 out this section—

4 (1) \$110,000,000 for fiscal year 2011;

5 (2) \$135,000,000 for fiscal year 2012;

6 (3) \$195,000,000 for fiscal year 2013;

7 (4) \$210,000,000 for fiscal year 2014; and

8 (5) \$210,000,000 for fiscal year 2015.



SECTION-BY-SECTION ANALYSIS OF
AMERICA COMPETES REAUTHORIZATION ACT OF 2010
AMENDMENT IN THE NATURE OF A SUBSTITUTE

TITLE I—SCIENCE AND TECHNOLOGY POLICY

SUBTITLE A—NATIONAL NANOTECHNOLOGY INITIATIVE AMENDMENTS

SEC. 101. SHORT TITLE.—“National Nanotechnology Initiative Amendments Act of 2010.”

SEC. 102. NATIONAL NANOTECHNOLOGY PROGRAM AMENDMENTS.—Modifies the NNI strategic plan to include the specification of: (1) near and long term objectives, (2) the timeframe for achieving near term objectives, (3) the metrics for measuring progress toward objectives, and (4) multi-agency funded projects in areas of significant economic and societal impacts authorized under section 105. Requires the National Nanotechnology Coordination Office (NNCO) to (1) develop a public database for projects funded under the Environmental, Health and Safety (EHS), Education and Societal Dimensions, and Nanomanufacturing program component areas; (2) develop, maintain and publicize information about NNI supported nanotechnology facilities available for use by academia and industry; (3) to report annually on its current and future budget requirements. Revises the charge to the National Academy of Sciences’ National Research Council for the content and scope of the triennial reviews of the NNI Program.

SEC. 103. SOCIETAL DIMENSIONS OF NANOTECHNOLOGY.—Requires an OSTP associate director to fulfill the role of coordinator for the societal dimensions component of NNI, and assigns specific responsibilities and duties to such coordinator. Requires the Program to support formal and informal nanotechnology science education, including support for course development, and faculty professional development. Requires formation of an Education Working Group to coordinate, prioritize, and plan the educational activities funded under the NNI.

SEC. 104. TECHNOLOGY TRANSFER.—Requires agencies supporting nanotechnology research facilities under the NNI to allow, and encourage, use of these facilities to assist companies in developing prototype products, devices, or processes for determining proof of concept. Requires agencies to encourage applications for support of nanotechnology projects under the SBIR, STTR, and TIP programs. Encourages the creation of industry liaison groups in all relevant industry sectors to foster technology transfer and to help guide the NNI research agenda.

SEC. 105. RESEARCH IN AREAS OF NATIONAL IMPORTANCE.—Requires the NNI to include support for large-scale nanotechnology research and development activities in application areas with potential for significant contributions to national economic competitiveness or other important societal benefits.

SEC. 106. NANOMANUFACTURING RESEARCH.—Specifies specific areas of research and development under the Nanomanufacturing program component area. Requires the NNI Advisory Panel to review the adequacy of the funding level for the Nanomanufacturing program component area and its relevance to industry needs.

SEC. 107. DEFINITIONS.—Defines terms used in the subtitle.

SUBTITLE B—NETWORKING AND INFORMATION TECHNOLOGY RESEARCH AND DEVELOPMENT

SEC. 111. SHORT TITLE.—“Networking and Information Technology Research and Development Act of 2010”.

SEC. 112. PROGRAM PLANNING AND COORDINATION.—Requires the NITRD agencies to periodically assess the program contents and funding levels and to update the program accordingly. Requires the NITRD agencies to develop and periodically update (at 3-year intervals) a strategic plan for the program and requires an annual update on how the program activities planned and underway relate to the objectives specified in the strategic plan.

SEC. 113. LARGE-SCALE RESEARCH IN AREAS OF NATIONAL IMPORTANCE.—Authorizes the NITRD agencies to support large-scale, long-term, interdisciplinary research with the potential to make significant contributions to society and U.S. economic competitiveness and to encourage collaboration between at least two agencies as well as cost-sharing from non-Federal sources.

SEC. 114. CYBER-PHYSICAL SYSTEMS AND INFORMATION MANAGEMENT.—Requires the program to support research and development in cyber-physical systems; human-computer interactions, visualization, and information management. Requires the NCO Director to convene a university/industry task force to explore mechanisms for carrying out collaborative research and development activities for cyber-physical systems.

SEC. 115. NATIONAL COORDINATION OFFICE.—Formally establishes the NCO; delineates the office’s responsibilities; mandates annual operating budgets; specifies the source of funding for the office (consistent with current practice); and stresses the role of the NCO in developing the strategic plan and in public outreach and communication with outside communities of interest.

SEC. 116. IMPROVING NETWORKING AND INFORMATION TECHNOLOGY EDUCATION.—Requires NSF use their programs to improve the teaching and learning of networking and information technology and encourage the participation of women and underrepresented minorities.

SEC. 117. CONFORMING AND TECHNICAL AMENDMENTS.—Makes conforming and technical changes to the High-Performance Computing Act of 1991.

SUBTITLE C—OTHER OSTP PROVISIONS

SEC. 121. FEDERAL SCIENTIFIC COLLECTIONS.—Requires the Office of Science and Technology Policy (OSTP), in consultation with relevant Federal agencies, to develop formal policies for the management and use of Federal scientific collections, including policies for the disposal of collections, and to create an online clearinghouse for information on the contents of and access to Federal scientific collections.

SEC. 122. COORDINATION OF MANUFACTURING RESEARCH AND DEVELOPMENT.—Establishes an interagency committee under the National Science and Technology Council (NSTC) with responsibilities to plan and coordinate Federal programs and activities in manufacturing research and development and to develop of a strategic plan.

SEC. 123. INTERAGENCY PUBLIC ACCESS COMMITTEE.—Establishes a working group under the NSTC to coordinate Federal science agency research and policies related to the dissemination and long-term stewardship of the results of Federally supported unclassified research, including digital data and peer-reviewed scholarly publications.

TITLE II—NATIONAL SCIENCE FOUNDATION

SEC. 201. SHORT TITLE.—The National Science Foundation Authorization Act of 2010

SUBTITLE A—GENERAL PROVISIONS

SEC. 211. DEFINITIONS.—Provides definitions for terms used in this title.

SEC. 212. AUTHORIZATION OF APPROPRIATIONS.—Authorizes \$47.5 billion for the National Science Foundation (NSF) for fiscal years 2011–2015, including \$38 billion for research and related activities (R&RA), \$6.4 billion for education and human resources (EHR), and \$1.2 billion for major research equipment and facilities construction (MREFC).

SEC. 213. NATIONAL SCIENCE BOARD ADMINISTRATIVE AMENDMENTS.—Eliminates the cap on the number of professional staff for the National Science Board (“the Board”). Changes the date on which the Board’s biennial Science and Engineering Indicators is due to the President and Congress. Modifies the scope of reports the Board may submit to the President and Congress. Modifies audit requirement for Board adherence to the Sunshine Act.

SEC. 214. BROADER IMPACTS REVIEW CRITERION.—Clarifies the intent of the Foundation’s Broader Impacts Review Criterion. Requires the Director to develop and implement a Foundation-wide policy that: includes a plan to educate Foundation staff, merit review panels, and grant applicants on the goals of the broader impacts review criterion; encourages colleges, universities and other organizations such as science museums to help NSF-funded investigators achieve the goals of the broader impacts review criterion through existing evidence-based programs and activities; and requires grant applicants to provide evidence of such institutional support for the portion of their proposal intended to satisfy the broader impact review criterion.

SEC. 215. NATIONAL CENTER FOR SCIENCE AND ENGINEERING STATISTICS.—Establishes the Foundation’s Division of Science Resource Statistics as the

National Center for Science and Engineering Statistics and codifies its function as the central Federal clearinghouse for objective data on the scientific and engineering enterprise and the state of STEM education.

SUBTITLE B—RESEARCH AND INNOVATION

SEC. 221. SUPPORT FOR POTENTIALLY TRANSFORMATIVE RESEARCH.—Requires the Director to apply at least 5 percent of the agency’s research toward high-risk, high-reward basic research. Provide a definition for “high-risk, high-reward” and examples for how the Director may meet the 5 percent requirement.

SEC. 222. FACILITATING INTERDISCIPLINARY COLLABORATIONS FOR NATIONAL NEEDS.—Requires the Director to provide awards for interdisciplinary research collaborations that are designed to address critical challenges to national security, competitiveness, and societal well-being.

SEC. 223. NATIONAL SCIENCE FOUNDATION MANUFACTURING RESEARCH.—Requires the Director to carry out a program to award competitive grants for manufacturing research.

SEC. 224. STRENGTHENING INSTITUTIONAL RESEARCH PARTNERSHIPS.—In cases where a research grant involves a partnership of colleges and universities, including a minority-serving institution or a predominately undergraduate institution, the Director is required to award funds to at least two of the institutions directly, including at least one minority-serving or predominately undergraduate institution.

SEC. 225. NATIONAL SCIENCE BOARD REPORT ON MID-SCALE INSTRUMENTATION.—Requires the Board to evaluate the need for mid-scale research instrumentation (instrumentation that falls between the Major Research Instrumentation program and the Major Research Equipment and Facilities Construction program), and provide recommendations regarding how the Foundation can best address those needs.

SEC. 226. SENSE OF CONGRESS ON OVERALL SUPPORT FOR RESEARCH INFRASTRUCTURE AT THE FOUNDATION.—Expresses the sense of Congress that the Foundation should strive to keep the percentage of the Foundation budget devoted to research infrastructure in the range of 24 to 27 percent, as recommended in the 2003 National Science Board report, “Science and Engineering Infrastructure for the 21st Century.”

SEC. 227. PARTNERSHIPS FOR INNOVATION.—Requires the Director to carry out a program to support partnerships between institutions of higher education and private sector entities in order to promote innovation and increase the economic and social impact of the research. Gives priority to partnerships that involve one of the top 100 research institutions and either a minority-serving institution, a primarily undergraduate institution, or a community college.

SEC. 228. PRIZE AWARDS.—Requires the Director to establish a 3-year pilot program to award innovation inducement cash prizes in research areas supported by the Foundation.

SUBTITLE C—STEM EDUCATION AND WORKFORCE TRAINING

SEC. 241. GRADUATE STUDENT SUPPORT.—Requires the Director to increase or decrease funding for the Integrative Graduate Education and Research Traineeship (IGERT) program at the same rate as the Graduate Research Fellowship (GRF) program. Requires that at least half of the total funds for IGERT and GRF come from the R&RA account. Requires the Director to increase the current cost of education allowance for awards made through the GRF program by \$1,500.

SEC. 242. POSTDOCTORAL FELLOWSHIP IN STEM EDUCATION RESEARCH.—Requires the Director to establish a postdoctoral fellowship program to encourage recent doctoral degree graduates in the STEM fields to pursue STEM education research and become leaders in STEM education reform.

SEC. 243. ROBERT NOYCE TEACHER SCHOLARSHIP PROGRAM.—Amends current law to remove the requirement that the service obligation of scholarship recipients be performed in a high-need local education agency, and instead provides a 1 year reduction of the service obligation for scholarship recipients who choose to perform their service in a high-need local education agency. Requires the Director to maintain a clearinghouse of information on teaching opportunities available in high-need local education agencies. Lowers the required amount of institutional matching for Noyce grants under Section 10A (master teachers and STEM professionals) from 50 to 30 percent.

SEC. 244. INSTITUTIONS SERVING PERSONS WITH DISABILITIES.—Ensures that institutions of higher education that are chartered to serve students with disabilities can benefit from STEM bridge programs and from research partnerships with major research universities funded by NSF. Clarifies that nothing in this section shall be construed to amend or otherwise affect any of the current statutory definitions for minority-serving institutions.

SEC. 245. INSTITUTIONAL INTEGRATION.—Requires the Director to award grants to colleges and universities for the integration of Foundation funded projects at those institutions in order to increase collaboration across funded projects and expand the impact of such projects.

SEC. 246. POSTDOCTORAL RESEARCH FELLOWSHIPS.—Requires the Director to establish a Foundation-wide postdoctoral research fellowship program, with priority given to proposals for interdisciplinary research and high-risk, high-reward research.

SEC. 247. BROADENING PARTICIPATION TRAINING AND OUTREACH.—Requires the Director to provide education and training to Foundation staff and review panels on effective tools for increasing participation in STEM by underrepresented groups.

SEC. 248. TRANSFORMING UNDERGRADUATE EDUCATION IN STEM.—Requires the Director to award grants to colleges and universities to reform undergraduate STEM education in their institutions, and specifies that proposals must include evidence of institutional support for, and commitment to, the proposed reform effort.

SEC. 249. 21ST CENTURY GRADUATE EDUCATION.—Requires the Director to award grants to institutions of higher education for the implementation or expansion of reforms in graduate STEM education that emphasize preparation for diverse STEM careers.

SEC. 250. UNDERGRADUATE BROADENING PARTICIPATION PROGRAM.—Prohibits the Foundation from consolidating the Historically Black Colleges and Universities Undergraduate Program, the Louis Stokes Alliances for Minority Participation program, and the Tribal Colleges and Universities Program into a single program in fiscal year 2011 (as proposed in the agency's budget request). Requires the Director to develop and submit a plan to Congress clarifying the objectives and rationale prior to any consolidation of the programs.

SEC. 251. GRAND CHALLENGES IN EDUCATION RESEARCH.—Requires NSF and the Department of Education (ED) to identify and prioritize grand challenges in research and development for preK–12 STEM education, and carry out and disseminate the results of such R&D. NSF and ED must issue a report to Congress outlining the grand challenges, the role of each agency in addressing the challenges, metrics for assessing progress toward meeting the challenges, how the agencies will disseminate the results of the research, and how the agencies will support the implementation of best practices.

SEC. 252. RESEARCH EXPERIENCES FOR UNDERGRADUATES.—Requires the Director to award grants to institutions of higher education, nonprofit organizations, or consortia of such institutions and organizations, for sites designated to provide research experiences for 10 or more undergraduate STEM students. Requires that research grant recipients planning to include undergraduate students in carrying out their research request support for the undergraduate students as part of the research proposal itself rather than as a supplement to the research proposal.

SEC. 253. LABORATORY SCIENCE PILOT PROGRAM.—Strikes the sunset clause for the Laboratory Science Pilot Program authorized in the 2007 COMPETES Act.—

TITLE III—STEM EDUCATION

SEC. 301. COORDINATION OF FEDERAL STEM EDUCATION.—Establishes an interagency committee to coordinate Federal programs and activities in support of STEM education. Requires this committee to develop a STEM education strategic plan to inform program and budget planning for agencies and to establish and maintain an inventory of federally sponsored STEM education activities, including documentation on program assessments. Requires the Director of OSTP to submit an annual report to Congress including a description and level of funding of the STEM education programs and activities of each participating Federal agency for the previous and current fiscal years.

SEC. 302. ADVISORY COMMITTEE ON STEM EDUCATION.—Requires the President to establish an advisory committee on STEM education responsible for soliciting input from a variety of stakeholder groups in order to offer guidance to the

President on how to better align Federal programs with the needs of States and school districts, and to improve connectivity between public and private STEM education efforts.

SEC. 303. STEM EDUCATION AT THE DEPARTMENT OF ENERGY.—Clarifies the role of the Department in contributing to STEM education, including energy systems science and engineering education, at all levels. Specifies the kinds of STEM education programs and activities that the Department is authorized to carry out. Requires the Secretary to appoint or designate a Director of STEM education with responsibility to oversee and coordinate all STEM education programs and activities across the Department. Requires the Director to develop, implement, and update a STEM education strategic plan for the Department, and maintain an online inventory of STEM education programs at the Department. Requires the Secretary to consult and partner with the Department of Education and the National Science Foundation on STEM education activities, when appropriate. Requires the Secretary to award grants to colleges and universities to develop or expand the energy systems science and engineering education capabilities of the institution and provide support to graduate students pursuing such courses of study.

TITLE IV-NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY

SEC. 401. SHORT TITLE.—National Institute of Standards and Technology Authorization Act of 2010

SEC. 402. AUTHORIZATION OF APPROPRIATIONS.—Authorizes a total of \$5.628 billion for the National Institute of Standards and Technology (NIST) for FY 2011 through FY 2015. The total consists of authorization levels of \$1.012 billion in FY 2011, \$1.035 billion in FY 2012, \$1.137 billion in FY 2013, \$1.188 billion in FY 2014, and \$1.256 billion in FY 2015. Includes within the total authorization a total of \$3.495 billion for NIST labs for FY 2011 through FY 2015. The total for NIST labs consists of authorization levels of \$620.0 million in FY 2011, \$657.2 million in FY 2012, \$696.7 million in FY 2013, \$738.5 million in FY 2014, and \$782.8 million in FY 2015. Includes within the total authorization a total of \$589 million for construction and maintenance of facilities for FY 2011 through FY 2015. The total for construction and maintenance consists of authorization levels of \$125 million for FY 2011, \$85 million for FY 2012, \$122 million for FY 2013, \$124 million for FY 2014, and \$133 million for FY 2015. Includes within the total authorization \$1.545 billion for industrial technology services for FY 2011 through FY 2015, which includes a total of \$681 million for the Technology Innovation Program (TIP), a total of \$811.2 million for the Manufacturing Extension Partnership (MEP) program, and a total of \$53.1 million for the Malcolm Baldrige National Quality Award program. The total for TIP consists of authorization levels of \$116 million for FY 2011, \$132 million for FY 2012, \$147 million for FY 2013, \$142 million for FY 2014, and \$144 million for FY 2015. The total for MEP consists of authorization levels of \$141.1 million for FY 2011, \$150.9 million for FY 2012, \$161.5 million for FY 2013, \$172.8 million for FY 2014, and \$184.9 million for FY 2015. The total for the Malcolm Baldrige National Quality Award program includes authorization levels for \$10 million for FY 2011, \$10.3 million for FY 2012, \$10.6 million for FY 2013, \$10.9 million for FY 2014, and \$11.3 million for FY 2015.

SEC. 403. UNDER SECRETARY OF COMMERCE FOR STANDARDS AND TECHNOLOGY.—Creates the position of the Under Secretary of Commerce for Standards and Technology. The current Director of NIST would become the Under Secretary until a successor is appointed. (This is the same structure as at the National Oceanic and Atmospheric Administration (NOAA))

SEC. 404. REORGANIZATION OF NIST LABORATORIES.—Organizes the NIST laboratories into the following operational units:

- 1) The Physical Measurement Lab, whose mission is to develop and maintain the national standards for length, mass, time, frequency, electricity, temperature, force, radiation, and developing standards policy;
- 2) The Information Technology Lab, whose mission and focus is developing standards and testing for interoperability, security, usability, and reliability of information technologies (IT) and communications technologies;
- 3) The Engineering Lab, whose mission is to develop and disseminate advance manufacturing and construction technologies, including performance metrics and technical standards for green infrastructure and energy efficiency, to the U.S. manufacturing and construction industries;
- 4) The Material Measurement Lab, whose mission is to serve as the national reference lab in biological, chemical, and material sciences and engineering;

- 5) The Center for Nanoscale Science and Technology, a nationally shared facility for use by industry, institutions of higher education, and Federal agencies (including NIST), whose mission is to develop innovative nanoscale measurement and fabrication capabilities; and
- 6) The NIST Center for Neutron Research, a nationally shared facility for use by industry, institutions of higher education, and Federal agencies (including NIST), whose mission is to provide neutron-based measurement capabilities for materials research, non-destructive evaluation, neutron imaging, chemical analysis, neutron standards, dosimetry, and radiation metrology.

Allows the Director to make future changes to the NIST laboratory structure, provided he submit a report to Congress before implementing such change.

SEC. 405. FEDERAL GOVERNMENT STANDARDS AND CONFORMITY ASSESSMENT COORDINATION.—Assigns the Director of NIST the responsibility of convening Federal departments and agencies to coordinate Federal Government policy goals and engagement on international technical standards and conformity assessment-related activities, working with industry and standards development organizations. Requires the Director to submit a report to Congress which addresses current and anticipated international standards issues with the potential to impact U.S. competitiveness and innovation capabilities, actions taken by the Federal Government to address these issues, and any action the Director is taking, or will take, to ensure effective Federal Government engagement on technical standards and conformity assessment-related issues.

SEC. 406. MANUFACTURING EXTENSION PARTNERSHIP.—Updates the MEP program:

- 1) Requires MEP Centers to inform local and regional community colleges of the skill sets local manufacturers need in their workplace;
- 2) Creates an innovation services initiative to assist small and medium-sized manufacturers to reduce their energy usage and environmental waste and to accelerate the domestic commercialization of new product technologies (including components of renewable energy systems). It also requires centers perform market analysis to ensure there is market demand for these new product technologies;
- 3) Requires NIST to assess its administration of the MEP program using the criteria of the Malcolm Baldrige National Quality Award;
- 4) Reduces the required cost share of all MEP Centers for fiscal years 2011 through 2015 and requires a report from the Under Secretary 4 years after enactment, with his recommendations on cost-share provisions; and
- 5) Exempts the MEP Advisory Board from Section 14 of the Federal Advisory Committee Act (FACA), 'Termination of advisory committees; renewal; continuation.'

SEC. 407. BIOSCIENCE RESEARCH PROGRAM.—Establishes a Bioscience Research Program at NIST to support the development of standard reference materials and measurements to advance biologic drug research and development, molecular diagnostics, medical imaging technology, and personalized medicine. Requires that at least one fellow from the postdoctoral fellowship program be assigned to the bioscience research program.

Allows the Director to establish University Research Centers through a competitive application process to conduct research that furthers the objectives of the bioscience research program. It requires that, not later than 3 years after any University Research Center is established, the Director evaluate each center for its contribution to the bioscience research program. If multiple university research centers are established, the Director shall convene an annual meeting among the researchers at such centers and NIST to foster collaboration.

Under the competitive application process, the institution must describe its research and instructional capacity in biosciences; research projects that will be undertaken; the extent to which any research program will include industry partners; the distribution of research results; and how the projects to be undertaken at the University Research Center will further the objectives of the bioscience research program. The competitive application process would also require the Director to give special consideration to minority-serving institutions, as defined in 7 U.S.C. § 7061 and 20 U.S.C. § 1059 *et seq.*

Allows the Director to establish a user facility for industry, institutions of higher education, nonprofit organizations, and government agencies in order to perform re-

search and testing, and provide access to advanced or unique equipment, services, materials, and other resources.

Changes the number of NIST's Visiting Committee on Advanced Technology members to vary between 15 and 20 and requiring at least 13 of those members to be from U.S. industry; requires the Director to include the bioscience research program in the programmatic planning document transmitted to Congress.

SEC. 408. EMERGENCY COMMUNICATION AND TRACKING TECHNOLOGIES RESEARCH INITIATIVE.—Requires the Director to establish an initiative to support the development of technical standards and conformance architecture to improve the operation and reliability of emergency communication and tracking technologies used in confined spaces, such as underground mines, and shielded environments, such as high-rise buildings and collapsed structures; requires the Director, as part of this initiative, to perform an assessment of the measurement, technical standards, and conformity assessment needs for these types of technologies and to submit a report on this needs assessment to Congress 18 months after enactment.

SEC. 409. TIP ADVISORY BOARD.—Exempts the TIP Advisory Board from Section 14 of FACA.

SEC. 410. UNDERREPRESENTED MINORITIES.—Requires the Director to give consideration to the goal of promoting underrepresented minorities in evaluating applications for NIST fellowships for university students and post-doctoral researchers. Also requires the Director to give special consideration for applications received from teachers at high-needs schools for the NIST teacher science and technology enhancement program.

SEC. 411. CYBERSECURITY STANDARDS AND GUIDELINES.—Clarifies that the use of cybersecurity standards and guidelines developed by NIST for industry and public would not be mandatory.

SEC. 412. DEFINITIONS.—Defines the terms 'Director' and 'Federal Agency.'

TITLE V—INNOVATION

SEC. 501. OFFICE OF INNOVATION AND ENTREPRENEURSHIP.—Requires the Secretary of Commerce to establish an Office of Innovation and Entrepreneurship to foster innovation and the commercialization of new technologies, products, processes, and services; specifies the duties to be carried out by the Office.

Establishes an Advisory Council on Innovation and Entrepreneurship to provide advice to the Secretary.

SEC. 502. FEDERAL LOAN GUARANTEES FOR INNOVATIVE TECHNOLOGIES IN MANUFACTURING.—Requires the Secretary of Commerce to establish a program to provide loan guarantees to small- and medium-sized manufacturers; defines eligible projects as projects to reequip, expand, or establish manufacturing facilities in the United States to use an innovative technology or an innovative process in manufacturing, or to manufacture an innovative technology product or an integral component of such product.

Limits the amount of a loan guarantee to an amount equal to 80 percent of the loan; sets out specific limitations on the authority to make loan guarantees; lays out requirements and limitations in the case of default; permits the Secretary to pay principal and interest to lenders or other holders of the loan in specified circumstances; sets out terms and conditions for loan guarantees and requires that the Secretary consult with the Secretary of the Treasury in establishing terms and conditions for loan guarantees.

Requires the Secretary to charge and collect fees for loan guarantees; mandates that borrowers, lenders, and other appropriate parties keep pertinent records and documents to facilitate an effective audit; provides for the full faith and credit of the United States for the payment of loan guarantees; requires the Secretary to issue final regulations before making any loan guarantees and specifies specific items that must be included in the final regulations.

Requires the Secretary to enter into an arrangement with an independent auditor for annual evaluations of the program and requires the Comptroller General to conduct an annual review of the Secretary's execution of the program; mandates a report to Congress containing a summary of all activities carried out under the program.

Requires that the Secretary ensure that activities carried out under the program are coordinated with, and do not duplicate the efforts of, other loan guarantee programs within the Federal Government.

Authorizes the Secretary to use centers established under Manufacturing Extension Partnership (MEP) program to provide information about the program and to conduct outreach to potential borrowers.

Defines “cost”, “innovative process”, “innovative technology”, “loan guarantee”, “obligation”, and “program”.

Provides an authorization of \$50 million for each of Fiscal Year 2011 through Fiscal year 2015 for the cost of loan guarantees; provides an authorization of such sums as are necessary for the Secretary to make payments of principal and interest under subsection (g).

SEC. 503. REGIONAL INNOVATION PROGRAM.—Requires the Secretary of Commerce to establish a regional innovation program to encourage and support the development of regional innovation strategies, including regional innovation clusters. Authorizes the Secretary to award grants on a competitive basis to States, tribes, local governments, nonprofit organizations, institutions of higher education, public-private partnerships, or economic development organizations for activities relating to the formation and development of regional innovation clusters; specifies activities for which grants may be used; defines eligible recipient; establishes requirements for grant applications; limits the amount of any project that the Secretary can provide to 50 percent; requires that the Secretary ensure that activities funded use and apply research, best practices, and metrics developed under the innovation research and information program.

Establishes a regional innovation research and information program; specifies the activities of the research and information program; permits the Secretary to award research grants to support and further the goals of the program; requires that the Secretary make data and analysis compiled under the research and information program available to other Federal agencies, State and local governments, and nonprofit and for-profit entities; requires that the Secretary incorporate data and analysis relating to any regional innovation cluster supported by a grant under subsection (b) into the research and information program.

Requires that the Secretary ensure that activities are coordinated with, and do not duplicate the efforts of, other programs at the Department of Commerce and other Federal agencies; requires the Secretary to explore and pursue ways to collaborate with other Federal agencies, including through multiagency funding opportunities, on regional innovation strategies.

Requires that the Secretary, within 4 years of enactment, enter into a contract with an independent entity, such as the National Academy of Sciences, to conduct an evaluation of the program, including a recommendation as to whether the program should be continued or terminated.

Defines “regional innovation cluster”

Authorizes such sums as are necessary for each of fiscal years 2011 through 2015 to carry out the program.

TITLE VI—DEPARTMENT OF ENERGY

SUBTITLE A—OFFICE OF SCIENCE

SEC. 601. SHORT TITLE.—Gives title of the bill as the “DOE Office of Science Authorization Act of 2010”

SEC. 602. DEFINITIONS.—Provides definitions for “DEPARTMENT”, “DIRECTOR”, “OFFICE OF SCIENCE”, and “SECRETARY”

SEC. 603. OFFICE OF SCIENCE ACTIVITIES.—Directs the Secretary of Energy to carry out research activities in science supporting the missions of the Department, including programs on basic energy sciences, biological and environmental research, advanced scientific computing research, fusion energy sciences, high energy physics, and nuclear physics.

Instructs the Department’s Under Secretary for Science to ensure the coordination with the other activities of the Department, and support joint activities among the Department’s programs.

SEC. 604.—BASIC ENERGY SCIENCES PROGRAM.—Directs the Director of the Office of Science to carry out a program in basic energy sciences, including materials sciences and engineering, chemical sciences, biosciences, and geosciences, for the purpose of providing the scientific foundations for new energy technologies.

As part of this program, the Director is instructed to support: construction and operation of the program’s major user facilities; competitively awarded energy frontier research centers; and relevant accelerator research and development activities, in coordination with the Office of Science’s High Energy Physics and Nuclear Physics programs.

SEC. 605. BIOLOGICAL AND ENVIRONMENTAL RESEARCH PROGRAM.—Authorizes a program of research, development, and demonstration in the areas of biological systems science and climate and environmental science.

The biological systems science research includes activities to: establish a virtual systems biology information framework; support research on computational biology; continue the research of the bioenergy research centers, and expand them to include biobased products; and direct the program to develop a synthetic biology plan.

The climate and environment science research includes activities to: support the research and coordination of the ecosystem observation AmeriFlux Network; develop a next-generation ecosystem-climate change experiment; continue research in regional and global climate modeling; support integrated assessment research.

SEC. 606. ADVANCED SCIENTIFIC COMPUTING RESEARCH PROGRAM.—Directs the Director to carry out a research, development, demonstration, and commercial application program to advance computational and networking capabilities to analyze, model, simulate, and predict complex phenomena relevant to the development of new energy technologies and the competitiveness of the United States.

Instructs the Secretary to produce a plan to integrate and leverage the expertise and capabilities of the program, as well as other relevant computational programs and resources supported by the Federal Government, to advance the missions of the Department's applied energy and energy efficiency programs.

Instructs the Secretary to, at least 18 months prior to the initiation of construction or installation of any exascale-class computing facility, produce a plan detailing the proposed facility's cost projections and capabilities to significantly accelerate the development of new energy technologies.

Authorizes research and development activities in applied mathematics, high-end computing software development, and next-generation computing architectures and platforms to support the missions of the Department.

SEC. 607. FUSION ENERGY RESEARCH PROGRAM.—Directs the Director to carry out a fusion energy sciences research and development program on the scientific and engineering challenges to building a cost-competitive fusion power plant and a fusion power industry in the United States.

As part of this program, the Director is instructed to: coordinate and carry out the responsibilities of the United States with respect to the ITER international fusion project; produce a 10-year prioritization plan; support fusion materials research and development activities in coordination with the Assistant Secretary for Nuclear Energy; carry out a computational project to advance the capability of fusion researchers to accurately simulate an entire fusion energy system, in collaboration with the Advanced Scientific Computing Research program.

In addition, the Secretary is instructed to establish a research and development program in inertial fusion for energy applications.

SEC. 608. HIGH ENERGY PHYSICS PROGRAM.—Directs the Director to carry out a research program on the elementary constituents of matter and energy and the nature of space and time.

As part of this program, the Director is instructed to support research in the nature of the neutrino, dark energy, and dark matter.

The Director is also instructed to carry out research and development in advanced accelerator concepts and technologies to reduce the necessary scope and cost for the next generation of particle accelerators.

SEC. 609. NUCLEAR PHYSICS PROGRAM.—Directs the Director to carry out a research program, and support relevant facilities, to discover and understand various forms of nuclear matter.

Director is also instructed to carry out a program for the production of isotopes, including the development of techniques to produce isotopes, for research applications.

SEC. 610. SCIENCE LABORATORIES INFRASTRUCTURE PROGRAM.—Directs the Director to carry out a program to improve the safety, efficiency, and mission readiness of infrastructure at Office of Science laboratories.

Sets the minor construction threshold at Office of Science laboratories at \$10 million, to be adjusted by the Secretary in accordance with the Engineering News-Record Construction Cost Index, or an appropriate alternative index as determined by the Secretary, once every 5 years after the date of enactment of this Act.

SEC. 611. AUTHORIZATION OF APPROPRIATIONS.—Authorizes to be appropriated to the Secretary of Energy for the activities of the Office of Science: \$6,221,000,000 for FY 2011; \$6,656,000,000 for FY 2012; \$7,122,000,000 for FY 2013; \$7,621,000,000 for FY 2014; \$8,154,000,000 for FY 2015.

SUBTITLE B—ADVANCED RESEARCH PROJECTS AGENCY-ENERGY

SEC. 621. Short Title.—ARPA-E Reauthorization Act of 2010

SEC. 622. ARPA-E AMENDMENTS.—Amends section 5012 of the America COMPETES Act of 2007 through the following:

(1) in GOALS

Adds provisions to clarify that ARPA-E will achieve its goals through both fundamental “and applied” science, and through “promoting the commercial application of advanced energy technologies”.

(2) in GOALS

Emphasizes that the R&D on manufacturing processes and technologies should be for the domestic manufacturing of novel energy technologies.

(3) Re-designates subsections (f) as (g), and reorders all subsections thereafter

(4) Inserts new subsection “(f) AWARDS” to clarify that the Director of ARPA-E has the authority to initiate and execute the full range of award instruments of the Department, including grants, contracts, cooperative agreements, cash prizes and other transactions. “Other Transactions Authority” is a flexible contracting authority granted to the Department in Section 1007 of the Energy Policy Act (EPA) of 2005.

(5) in PERSONNEL

Inserts new paragraph (1) requiring the Director to maintain a staff of qualified and experienced legal counsel, contracting personnel, and program directors to serve solely within ARPA-E, thus further allowing ARPA-E to remain separate and distinct from the other programs within the Department.

Makes changes to clarify that program managers (program directors) can direct more than one program, and that program managers (program directors) are not required to seek the advice of advisory committees or scientific organizations in making award selections.

Adds to the list of program manager (program director) responsibilities identifying cost-sharing opportunities for projects, including through possible exercising of waiver authority by the Secretary under Section 988 of EPA 2005; and identifying ways to transfer successful energy technology projects to the marketplace.

Clarifies that the term of a program manager (program director) may be “up to” 3 years.

Strikes requirement that ARPA-E have at least 70 and not less than 120 personnel. Replaces term “program manager” with “program director” to align with current practices of ARPA-E.

Authorizes the Director to select exceptional scientific, legal, business, and technical personnel to serve as limited terms as Fellows.

(6) in REPORTS and ROADMAPS

Shifts deadlines for the Strategic Vision Roadmap from 2008 and 2011, to 2010 and 2013, respectively.

(7) in FEDERAL DEMONSTRATION OF TECHNOLOGIES

Strengthens existing language to require Director to actively seek opportunities to demonstrate ARPA-E technologies through procurement by DOE and other Federal agencies.

(8) Inserts new subsection “(k) EVENTS” authorizing the Director to convene events for the purposes of allowing ARPA-E project awardees and finalist to demonstrate technologies to a range of stakeholders, and for other purposes as determined by the Director.

(9) in ARPA-E EVALUATION

Changes from “4 years” to “6 years” the time after establishment at which the National Academies will evaluate the performance of ARPA-E.

(10) in ARPA-E EVALUATION

Adds a requirement that the lessons learned in the National Academies evaluation of ARPA-E shall consider how such lessons may apply to other programs within DOE.

(11) in FUNDING

Extends Authorization of Appropriations for Fiscal Years 2011 through 2015:

- (A) \$300,000,000 for fiscal year 2011
- (B) \$500,000,000 for fiscal year 2012
- (C) \$700,000,000 for fiscal year 2013
- (D) \$900,000,000 for fiscal year 2014
- (E) \$1,000,000,000 for fiscal year 2015

And such sums as are necessary for each of fiscal years 2016 through 2020.

(12) in FUNDING

Strikes Limitation which made fiscal year 2008 funding for ARPA-E contingent upon the Office of Science receiving an increase from 2007.

(13) in FUNDING

Increases the amount of funds that shall be used for technology transfer and outreach activities from 2.5 percent to 5 percent of total appropriated funds, consistent with the program's goals of advancing technologies to commercial application.

SUBTITLE C—ENERGY INNOVATION HUBS

SEC 631. SHORT TITLE.—Energy Innovation Hubs Authorization Act of 2010

SEC 632. ENERGY INNOVATION HUBS.—(a) ESTABLISHMENT OF PROGRAM.—Directs the Secretary to carry out a program to create Energy Innovation Hubs that will conduct and support research, development, demonstration and commercial application of advanced energy technologies. Where practicable these activities should occur in a central location. Each Hub created shall be focused on a particular unique advanced energy technology. The Secretary will ensure that the program is coordinated with other DOE research entities so as to avoid duplication and shall convene representatives from the Hubs, DOE, and any other relevant entities the Secretary find appropriate. The Secretary shall also administer each Hub through a DOE program with relevant jurisdiction based on a Hub's technology focus.

(b) CONSORTIA.—Outlines the requirements that must be met by an applicant consortium in order to be eligible to form a Hub. A consortium must be made up of at least two qualifying entities who have created a binding agreement documenting the partnership agreement, measures to ensure cost-effective implementation, a proposed budget, conflict of interest procedures, an accounting structure, and an external advisory committee. The application made by the consortium to the Secretary will be made by one of the consortium's members as a prime applicant. The application shall describe the consortium agreement and, in the event consortium members will not be in a centralized location shall include a communications plan to ensure integration of the Hub's activities.

(c) SELECTION AND SCHEDULE.—Establishes the process by which the Secretary shall review all consortium applications received. The Secretary shall review all Hub applications received, and consortia grants will be approved through a competitive process. Any grant made to a Hub shall be for a period no longer than 5 years and may be renewed through a competitive process.

(d) HUB OPERATIONS.—Details that a Hub shall conduct multidisciplinary, collaborative research, development, demonstration, and commercial application of advanced energy technologies. A Hub shall encourage collaboration and communication and, whenever practicable, conduct its activities at one centralized location. In order to provide greater transparency, the Hub shall develop and publish on DOE's website all proposed plans and programs. In addition to a general duty to monitor project implementation and coordination, the Hub shall submit an annual report to the Secretary that summarizes all activities and projects, expenditures, and external advisory committee members.

The external advisory committee each Hub is required to establish under this section will advise Hub management on programs and planned activities, but shall not have decision making authority. The advisory committee membership should have sufficient expertise to provide guidance on scientific, technical, financial, and research management matters.

This section also requires each Hub to establish procedures to address conflicts of interest, consistent with those already established by DOE. The Secretary may disqualify an application or revoke funds if a failure to disclose any conflict of interest is discovered.

(e) PROHIBITION ON CONSTRUCTION.—Prohibits any funds granted by the Secretary to a Hub to be used for construction of a new building or facility for Hub activities. Furthermore, construction of new buildings or facilities shall not be considered as part of the non-Federal share of a Hub cost-sharing agreement. Excluded from this prohibition are any buildings or facilities constructed to serve as a test bed or any renovations to existing buildings or facilities so long as the test bed or renovations are limited to the scope and scale of the research.

(f) OVERSIGHT BOARD.—Requires the Secretary to establish within the Department an Oversight Board to monitor the Hubs and their activities.

(g) DEFINITIONS.—Provides the definitions for terms used within the bill, including: Advanced Energy Technology, Hub, Institution of Higher Education, Qualifying Entity, and Secretary.

(h) AUTHORIZATION OF APPROPRIATIONS.—Provides authorizations for each of the fiscal years 2011 through 2015 as follows:

- (1) \$110,000,000 for fiscal year 2011;
- (2) \$135,000,000 for fiscal year 2012;
- (3) \$195,000,000 for fiscal year 2013;
- (4) \$210,000,000 for fiscal year 2014; and
- (5) \$210,000,000 for fiscal year 2015.

House Committee on Science and Technology
Markup
April 28, 2010

AMENDMENT ROSTER

H.R. 5116 the America COMPETES Reauthorization Act of 2010 – Amendment in the Nature of a Substitute

No.	Sponsor	Description	Results
1	Mr. Gordon (Manager's Amendment)	Makes several technical and clarifying changes to the Amendment in the Nature of a Substitute. Amends authorizations of appropriations in Sections 212, 402, 611, and 622 of the Amendment in the Nature of a Substitute.	Agreed to by voice vote.
2	Broun (172)	Second degree amendment, amends the authorizations of appropriations levels contained in the Manager's Amendment.	Defeated by roll call vote: Y-11 N-24 Present-1
3	Mr. Diaz-Balart (023)	Second degree amendment, amends the authorizations of appropriations levels contained in the Manager's Amendment.	Defeated by roll call vote: Y-11 N-25 Present-1
4	Mr. Diaz-Balart (022)	Second degree amendment, amends the Manager's Amendment to strike all authorizations of appropriations after fiscal year 2013.	Defeated by voice vote.
5	Mr. Rohrabacher (038)	Second degree amendment, amends the Manager's Amendment to strike all authorizations of appropriations for ARPA-E after fiscal year 2013.	Defeated by voice vote.
6	Mr. Rohrabacher (033)	Second degree amendment, amends the Manager's Amendment to strike all authorizations of appropriations for ARPA-E after fiscal year 2015.	Agreed to by voice vote.
7	Ms. Biggert (102)	Second degree amendment amends the authorization levels for ARPA-E.	Defeated by voice vote.
8	Ms. Johnson (114)	Inserts new Section 124 ("Fulfilling the Potential of Women in Academic Science and	Agreed to by voice vote.

		Engineering”). Inserts new Section 216 (“Collection of Data on Demographics of Faculty”).	
9	Ms. Dahlkemper (033)	Amends Section 223 of the Amendment in the Nature of a Substitute (“National Science Foundation Manufacturing Research”) by inserting a new subsection (b) (“Manufacturing Education”) to require the NSF to award grants to strengthen technical education and training in advanced manufacturing, including through the NSF’s Advanced Technological Education (ATE) program.	Agreed to by voice vote.
10	Mr. Inglis (017)	Amends Section 228 (“Prize Awards”) by adding an additional eligibility prerequisite for the awarding of prizes, which prohibits projects that utilized Federal funds to engage in the research for which the prize is being awarded from being eligible for prizes.	Agreed to by voice vote.
11	Mr. Hall (012)	Inserts a new Sec. 229 (“Repeal of Academic Research Facilities Modernization Program”).	Defeated by voice vote.
12	Mr. Neugebauer (008)	Amends Section 243 (“Robert Noyce teacher scholarships program”) to strike amendments to Section 10A of the National Science Foundation Authorization Act of 2002.	Withdrawn.
13	Mr. Neugebauer (013)	Amends Section 243 (“Robert Noyce teacher scholarships program”) to prohibit the use of funds awarded under the section “by an institution of higher education to engage in capacity building activities.”	Withdrawn.
14	Mr. Neugebauer (026)	Amends Section 243 (“Robert Noyce teacher scholarships program”) to require that the matching requirement be “provided in cash,” rather than “cash or in-kind.”	Agreed to by voice vote.
15	Mr. Ehlers (039)	Amends Section 248 (“Transforming Undergraduate Education in STEM”) by adding a provision stating that uses of funds under the section may include “support for initiatives that advance integration of global challenges such as sustainability into disciplinary and interdisciplinary STEM education.”	Agreed to by voice vote.
16	Mr. Wilson (027)	Amends Section 251 (“Grand Challenges in Education Research”) by specifying that “students in rural schools” should be	Agreed to by voice vote.

		included in the “diverse learning populations” to be considered in developing research grand challenges.	
17	Mr. Bartlett (011)	Amends Section 253 (“Laboratory Science Pilot Program”) by adding a provision repealing Subparagraphs (B), (C), (D), (E), and (F) of Section 8(8) of the National Science Foundation Act of 2002 – the “Partnerships for Access to Laboratory Science” program.	Withdrawn.
18	Mr. Wu (041)	Inserts a new Section 254 (“STEM Industry Internship Programs”) authorizing NSF to award grants for the purpose of providing integrated internship experiences for undergraduate students that “connect private sector internship experiences with the students’ STEM coursework.”	Agreed to by voice vote.
19	Mr. Bartlett (023)	Second degree amendment to Mr. Wu’s amendment (041). Adds a provision requiring a “50 percent non-Federal cost-share from partnerships established or expanded” under the Section. Adds a provision restricting the use of Federal funds provided under the section under certain circumstances.	Agreed to by voice vote.
20	Mr. Luján (049)	Inserts a new Section 254 (“Tribal Colleges and Universities Program”) requiring the Director of NSF to continue to support the Tribal Colleges and Universities program. Specifies certain activities that grants awarded under the program shall support, and states that funding may be used for instrumentation.	Agreed to by voice vote.
21	Mr. Diaz-Balart (021)	Amends the Amendment in the Nature of a Substitute by striking all authorizations of appropriations for fiscal years after fiscal year 2013 for the following sections: 303(c) (“Energy Applied Science Talent Expansion Program For Institutions of Higher Education”); Section 502 (“Federal Loan Guarantees For Innovative Technologies In Manufacturing”); Section 503 (“Regional Innovation Program”); and Section 632 (“Energy Innovation Hubs”).	Withdrawn.
22	Mr. McCaul (034)	Inserts new Section 304 (“Green Energy Education”) authorizing the Secretary of DOE to provide funds to the NSF for the Integrative Graduate Education and Research	Agreed to by voice vote.

		Traineeship program. Authorizes the Secretary to contribute funds to curriculum development activities at the NSF.	
23	Mr. Hall (278)	Amends Section 404 ("Reorganization of NIST Laboratories") with respect to the mission of the Engineering Laboratory by striking "promotion of green infrastructure, and energy efficiency measurements and standards" and replacing it with "and promotion of standards adoption".	Agreed to by voice vote.
24	Mr. Broun (279)	Strikes Title V ("Innovation")	Defeated by roll call vote: Y-8 N-25
25	Mr. Ehlers (284)	Amends Section 502 ("Federal Loan Guarantees For Innovative Technologies In Manufacturing") by adding to the list of items that the Secretary of Commerce must address in final regulations for the manufacturing loan guarantee program criteria that the Secretary shall use to determine "whether a borrower demonstrates that a market exists for the innovative technology product, or the integral component of such product, to be manufactured, as evidenced by written statements of interest from potential purchasers."	Agreed to by voice vote.
26	Mr. Bartlett (287)	Amends Section 502 ("Federal Loan Guarantees For Innovative Technologies In Manufacturing") to require that the Secretary of Commerce promulgate regulations and policies to carry out the manufacturing loan guarantee program in accordance with OMB Circular A-129.	Agreed to by voice vote.
27	Mr. Bilbray (290)	Amends Section 502 ("Federal Loan Guarantees For Innovative Technologies In Manufacturing") to state that it is the Sense of Congress that no loan guarantee shall be made under the manufacturing loan guarantee program unless the borrower agrees to use a federally-approved electronic employment eligibility verification system to verify employment eligibility.	Agreed to by voice vote.
28	Mr. Lipinski (062)	Amends Section 603 ("Mission of the Office of Science") to require the Director to develop a plan to increase the percentage of	Agreed to by voice vote.

		domestically sourced hardware for projects of Office of Science.	
29	Ms. Biggert (101)	Amends Section 603 ("Mission of the Office of Science") to require that, as part of the President's annual budget request, the Secretary include a detailed summary of the degree to which current research activities are competitive and merit-reviewed.	Agreed to by voice vote.
30	Mr. Inglis (025)	Amends Section 605 ("Biological and Environmental Research Program") to include hydrogen among the targeted research, development, and demonstration biological systems science activities.	Agreed to by voice vote.
31	Mr. Smith (005)	Amends Section 605 ("Biological and Environmental Research Program") to include requirements for a research plan for Biological System Science activities.	Agreed to by voice vote.
32	Mr. Olson (003)	Strikes Subsection 605(c) ("Climate and Environmental Sciences Activities").	Defeated by voice vote.
33	Mr. Neugebauer (068)	Amends section 622 ("ARPA-E Amendments") to make it a priority for the ARPA-E Director to "ensure that, of the projects funded under this section, those with a high potential to result in technology advances that enable reductions in imports of energy from foreign sources receive the highest priority consideration from the Director."	Defeated by voice vote.
34	Mr. Smith (015)	Amends section 622 ("ARPA-E Amendments") to require applicants to disclose prior efforts and investments in proposed projects, and requires the Director to justify funding projects with prior industry support.	Agreed to by voice vote.
35	Mr. Olson (006)	Amends section 622(4), in the proposed subsection (f), by striking "shall" and inserting "may".	Withdrawn.
36	Ms. Biggert (018)	Amends section 632 ("Energy Innovation Hubs") by striking the paragraph entitled "Test Bed and Renovation Exception."	Withdrawn.
37	Ms. Johnson (113)	Amends section 632 ("Energy Innovation Hubs") by adding a new subsection which directs the Secretary to give priority consideration to applications in which 1 or more of the institutions under subsection (b)(1)(A) are 1890 Land Grant Institutions, Predominantly Black Institutions, Tribal Colleges or Universities, or Hispanic Serving	Agreed to by voice vote.

		Institutions.	
38	Mr. Hall (022)	Amends section 632 (“Energy Innovation Hubs”) by adding to the list of definitions of Advanced Energy Technologies, innovative technology “that enhances the energy independence and security of the United States by enabling improved or expanded supply and production of domestic energy resources, including coal, oil, and natural gas.”	Agreed to by voice vote.
39	Mr. Peters (033)	Amends section 632 (“Energy Innovation Hubs”) by adding to the list of definitions of Advanced Energy Technologies, innovative technology “that enables advanced vehicles, vehicle components, and related technologies that result in significant energy savings.”	Agreed to by voice vote.
40	Ms. Biggert (100)	Amends section 632 (“Energy Innovation Hubs”) by inserting “including the Department of Energy Federally Funded Research and Development Centers” after “Federal entity.”	Agreed to by voice vote.
41	Mr. Luján (048)	Amends Title VI (“Department of Energy”), by adding a new subtitle (Cooperative Research and Development Fund) to require the Secretary to “make funds available to Department of Energy National Laboratories for the Federal share of cooperative research and development agreements,” and authorizes such sums for that purpose.	Agreed to by voice vote.
42	Ms. Biggert (103)	Second degree amendment to Mr. Lujan’s amendment (048), inserts the requirement that “No funds allocated for this section shall come from funds allocated for the Office of Science.”	Agreed to by voice vote.
43	Mr. Bartlett (022)	Adds a new Title to the bill expressing a sense of Congress that, “among the programs and activities authorized in this Act, those that correspond to the recommendations of the National Academy of Sciences’ 2005 report entitled ‘Rising Above the Gathering Storm’ remain critical to maintaining long-term United States economic competitiveness, and accordingly shall receive funding priority.”	Agreed to by voice vote.
44	Mr. Broun (023)	Adds a new Title to the end of the bill which states that, “None of the funds authorized to be appropriated pursuant to the amendments made by this title may be used to lobby any	Withdrawn.

		person or entity.”	
45	Mr. Hall (022)	Adds a new Title to the end of the bill which states that “institutions of higher education chartered to serve large numbers of student with disabilities,” and, “those with programs serving or those serving disabled veterans, shall receive special consideration and have a designation consistent with the designation for other institutions that serve populations underrepresented in STEM...”	Agreed to by voice vote.
46	Mr. Hall (024)	Adds a new Title to the end of the bill which states that, “In awarding scholarships and fellowships under this Act, an institution of higher education shall give preference to applications from veterans and service members...”	Agreed to by voice vote.
47	Mr. Neugebauer (069)	Adds a new Title to the end of the bill which states that no funds authorized to be appropriated in sections 212, 303, 402, 502, 503, 611, 622, and 632 “are authorized to be appropriated for activities under those sections in amounts that exceed authorizations for such purposes for fiscal year 2010 before the end of the first fiscal year for which the Director of the Congressional Budget Office certifies to the Congress in writing that the Federal Government does not have a budget deficit.”	Defeated by roll call vote: Y-8 N-23
48	Mr. Neugebauer (070)	Adds a new Title to the end of the bill which changes the effective date of the Act to the “first January 1 occurring after the date of enactment of this Act and after the conclusion of a fiscal year in which the Federal Government did not have a budget deficit.”	Withdrawn.
49	Mr. Rohrabacher (034)	Adds a new Title to the end of the bill which prohibits the use of funds authorized in the Act for projects unless: “(1) all persons receiving funds are United States citizens; and, (2) all entities receiving funds are headquartered in the United States.”	Defeated by voice vote.
50	Mr. Rohrabacher (035)	Adds a new Title to the end of the bill which prohibits the use of funds authorized in the Act for “research and development unless all entities involved in such research and development agree not to use any developed and related technologies for manufacturing	Defeated by voice vote.

		outside of the United States.”	
51	Mr. Rohrabacher (036)	Adds a new Title to the end of the bill which prohibits funding authorized in the Act being “provided to any person or entity found guilty of infringing on the patent rights of any other person or entity.”	Withdrawn.
52	Mr. Rohrabacher (037)	Adds a new Title to the end of the bill which states that, “Intellectual property rights from technologies developed using funds authorized in this Act shall be apportioned to the granting agency in direct proportion of the funds granted to the total project cost.”	Defeated by roll call vote: Y-12 N-22
53	Mr. Broun (028)	Strikes Section 228 (“Prize Awards”); Section 407 (“Bioscience research program”); Section 502 (“Federal loan guarantees for innovative technologies in manufacturing”); Section 503 (“Regional Innovation Program”); subtitle C of title VI (“Energy Innovation Hubs”); and in Section 406 (“Manufacturing Extension Partnership”) strikes subsections (b) (“Innovative Services Initiative”) and (c) (“Reports”).	Defeated by roll call vote: Y-9 N-25
54	Mr. Bilbray w/ Mr. Garamendi (040)	Amends Section 607 (“Fusion Energy Research Program”) to require that the Director “carry out activities to develop technologies necessary to enable the reliable, sustainable, safe, and economically competitive operation of a commercial fusion power plant.”	Agreed to by voice vote.
55	Mr. Bartlett (021)	Amends section 622 (“ARPA-E Amendments”) subsection (k) “Events”, by directing that “Funding for the activities described in paragraph (1) shall be provided as part of the technology transfer and outreach activities authorized under subsection (o)(4)(B).”	Agreed to by voice vote.

**AMENDMENT TO THE AMENDMENT IN THE
NATURE OF A SUBSTITUTE
OFFERED BY MR. GORDON OF TENNESSEE**

Page 60, lines 21 through 24, strike “describing the status” and all that follows through “subsection (b)(5).” and insert “describing—

1 (1) any priorities established under subsection
2 (b)(5);

3 (2) the status of any Federal science agency
4 policies related to public access to the results of fed-
5 erally funded research; and

6 (3) how any policies developed or being devel-
7 oped by Federal science agencies, as described in
8 paragraph (2), incorporate input from the non-Fed-
9 eral stakeholders described in subsection (b)(4).

Page 62, line 15, through page 66, line 13, amend section 212 to read as follows:

10 **SEC. 212. AUTHORIZATION OF APPROPRIATIONS.**

11 (a) FISCAL YEAR 2011.—

12 (1) IN GENERAL.—There are authorized to be
13 appropriated to the Foundation \$7,481,000,000 for
14 fiscal year 2011.

1 (2) SPECIFIC ALLOCATIONS.—Of the amount
2 authorized under paragraph (1)—

3 (A) \$6,020,000,000 shall be made avail-
4 able for research and related activities;

5 (B) \$945,000,000 shall be made available
6 for education and human resources;

7 (C) \$166,000,000 shall be made available
8 for major research equipment and facilities con-
9 struction;

10 (D) \$330,000,000 shall be made available
11 for agency operations and award management;

12 (E) \$4,840,000 shall be made available for
13 the Office of the National Science Board; and

14 (F) \$14,830,000 shall be made available
15 for the Office of Inspector General.

16 (b) FISCAL YEAR 2012.—

17 (1) IN GENERAL.—There are authorized to be
18 appropriated to the Foundation \$8,127,000,000 for
19 fiscal year 2012.

20 (2) SPECIFIC ALLOCATIONS.—Of the amount
21 authorized under paragraph (1)—

22 (A) \$6,496,000,000 shall be made avail-
23 able for research and related activities;

24 (B) \$1,020,000,000 shall be made avail-
25 able for education and human resources;

1 (C) \$235,000,000 shall be made available
2 for major research equipment and facilities con-
3 struction;

4 (D) \$356,000,000 shall be made available
5 for agency operations and award management;

6 (E) \$5,010,000 shall be made available for
7 the Office of the National Science Board; and

8 (F) \$15,350,000 shall be made available
9 for the Office of Inspector General.

10 (e) FISCAL YEAR 2013.—

11 (1) IN GENERAL.—There are authorized to be
12 appropriated to the Foundation \$8,764,000,000 for
13 fiscal year 2013.

14 (2) SPECIFIC ALLOCATIONS.—Of the amount
15 authorized under paragraph (1)—

16 (A) \$7,009,000,000 shall be made avail-
17 able for research and related activities;

18 (B) \$1,100,000,000 shall be made avail-
19 able for education and human resources;

20 (C) \$250,000,000 shall be made available
21 for major research equipment and facilities con-
22 struction;

23 (D) \$384,000,000 shall be made available
24 for agency operations and award management;

1 (E) \$5,180,000 shall be made available for
2 the Office of the National Science Board; and

3 (F) \$15,890,000 shall be made available
4 for the Office of Inspector General.

5 (d) FISCAL YEAR 2014.—

6 (1) IN GENERAL.—There are authorized to be
7 appropriated to the Foundation \$9,436,000,000 for
8 fiscal year 2014.

9 (2) SPECIFIC ALLOCATIONS.—Of the amount
10 authorized under paragraph (1)—

11 (A) \$7,562,000,000 shall be made avail-
12 able for research and related activities;

13 (B) \$1,187,000,000 shall be made avail-
14 able for education and human resources;

15 (C) \$250,000,000 shall be made available
16 for major research equipment and facilities con-
17 struction;

18 (D) \$415,000,000 shall be made available
19 for agency operations and award management;

20 (E) \$5,370,000 shall be made available for
21 the Office of the National Science Board; and

22 (F) \$16,440,000 shall be made available
23 for the Office of Inspector General.

24 (e) FISCAL YEAR 2015.—

1 (1) IN GENERAL.—There are authorized to be
 2 appropriated to the Foundation \$10,161,000,000 for
 3 fiscal year 2015.

4 (2) SPECIFIC ALLOCATIONS.—Of the amount
 5 authorized under paragraph (1)—

6 (A) \$8,160,000,000 shall be made avail-
 7 able for research and related activities;

8 (B) \$1,281,000,000 shall be made avail-
 9 able for education and human resources;

10 (C) \$250,000,000 shall be made available
 11 for major research equipment and facilities con-
 12 struction;

13 (D) \$447,000,000 shall be made available
 14 for agency operations and award management;

15 (E) \$5,550,000 shall be made available for
 16 the Office of the National Science Board; and

17 (F) \$17,020,000 shall be made available
 18 for the Office of Inspector General.

Page 91, lines 3 through 21, strike “(a) SECTION 10
 AMENDMENTS” and all that follows through “(b) SEC-
 TION 10A AMENDMENTS”.

Page 121, line 8, strike “and”.

Page 121, line 9, insert “and” after the semicolon.

Page 121, after line 9, insert the following new clause:

1 “(ix) carbon capture and sequestra-
2 tion science and engineering;”.

Page 135, strike line 13 and all that follows through line 17 on page 141 and insert the following:

3 **SEC. 402. AUTHORIZATION OF APPROPRIATIONS.**

4 (a) FISCAL YEAR 2011.—

5 (1) IN GENERAL.—There are authorized to be
6 appropriated to the Secretary of Commerce
7 \$991,100,000 for the National Institute of Stand-
8 ards and Technology for fiscal year 2011.

9 (2) SPECIFIC ALLOCATIONS.—Of the amount
10 authorized under paragraph (1)—

11 (A) \$620,000,000 shall be authorized for
12 scientific and technical research and services
13 laboratory activities;

14 (B) \$125,000,000 shall be authorized for
15 the construction and maintenance of facilities;
16 and

17 (C) \$246,100,000 shall be authorized for
18 industrial technology services activities, of
19 which—

1 (i) \$95,000,000 shall be authorized
2 for the Technology Innovation Program
3 under section 28 of the National Institute
4 of Standards and Technology Act (15
5 U.S.C. 278n);

6 (ii) \$141,100,000 shall be authorized
7 for the Manufacturing Extension Partner-
8 ship program under sections 25 and 26 of
9 such Act (15 U.S.C. 278k and 278l); and

10 (iii) \$10,000,000 shall be authorized
11 for the Malcolm Baldrige National Quality
12 Award program under section 17 of the
13 Stevenson-Wydler Technology Innovation
14 Act of 1980 (15 U.S.C. 3711a).

15 (b) FISCAL YEAR 2012.—

16 (1) IN GENERAL.—There are authorized to be
17 appropriated to the Secretary of Commerce
18 \$992,400,000 for the National Institute of Stand-
19 ards and Technology for fiscal year 2012.

20 (2) SPECIFIC ALLOCATIONS.—Of the amount
21 authorized under paragraph (1)—

22 (A) \$657,200,000 shall be authorized for
23 scientific and technical research and services
24 laboratory activities;

1 (B) \$85,000,000 shall be authorized for
2 the construction and maintenance of facilities;
3 and

4 (C) \$250,200,000 shall be authorized for
5 industrial technology services activities, of
6 which—

7 (i) \$89,000,000 shall be authorized
8 for the Technology Innovation Program
9 under section 28 of the National Institute
10 of Standards and Technology Act (15
11 U.S.C. 278n);

12 (ii) \$150,900,000 shall be authorized
13 for the Manufacturing Extension Partner-
14 ship program under sections 25 and 26 of
15 such Act (15 U.S.C. 278k and 278l); and

16 (iii) \$10,300,000 shall be authorized
17 for the Malcolm Baldrige National Quality
18 Award program under section 17 of the
19 Stevenson-Wydler Technology Innovation
20 Act of 1980 (15 U.S.C. 3711a).

21 (c) FISCAL YEAR 2013.—

22 (1) IN GENERAL.—There are authorized to be
23 appropriated to the Secretary of Commerce
24 \$1,079,809,000 for the National Institute of Stand-
25 ards and Technology for fiscal year 2013.

1 (2) SPECIFIC ALLOCATIONS.—Of the amount
2 authorized under paragraph (1)—

3 (A) \$696,700,000 shall be authorized for
4 scientific and technical research and services
5 laboratory activities;

6 (B) \$122,000,000 shall be authorized for
7 the construction and maintenance of facilities;
8 and

9 (C) \$261,109,000 shall be authorized for
10 industrial technology services activities, of
11 which—

12 (i) \$89,000,000 shall be authorized
13 for the Technology Innovation Program
14 under section 28 of the National Institute
15 of Standards and Technology Act (15
16 U.S.C. 278n);

17 (ii) \$161,500,000 shall be authorized
18 for the Manufacturing Extension Partner-
19 ship program under sections 25 and 26 of
20 such Act (15 U.S.C. 278k and 278l); and

21 (iii) \$10,609,000 shall be authorized
22 for the Malcolm Baldrige National Quality
23 Award program under section 17 of the
24 Stevenson-Wydler Technology Innovation
25 Act of 1980 (15 U.S.C. 3711a).

1 (d) FISCAL YEAR 2014.—

2 (1) IN GENERAL.—There are authorized to be
3 appropriated to the Secretary of Commerce
4 \$1,126,227,000 for the National Institute of Stand-
5 ards and Technology for fiscal year 2014.

6 (2) SPECIFIC ALLOCATIONS.—Of the amount
7 authorized under paragraph (1)—

8 (A) \$738,500,000 shall be authorized for
9 scientific and technical research and services
10 laboratory activities;

11 (B) \$124,000,000 shall be authorized for
12 the construction and maintenance of facilities;
13 and

14 (C) \$263,727,000 shall be authorized for
15 industrial technology services activities, of
16 which—

17 (i) \$80,000,000 shall be authorized
18 for the Technology Innovation Program
19 under section 28 of the National Institute
20 of Standards and Technology Act (15
21 U.S.C. 278n);

22 (ii) \$172,800,000 shall be authorized
23 for the Manufacturing Extension Partner-
24 ship program under sections 25 and 26 of
25 such Act (15 U.S.C. 278k and 278l); and

1 (iii) \$10,927,000 shall be authorized
2 for the Malcolm Baldrige National Quality
3 Award program under section 17 of the
4 Stevenson-Wydler Technology Innovation
5 Act of 1980 (15 U.S.C. 3711a).

6 (e) FISCAL YEAR 2015.—

7 (1) IN GENERAL.—There are authorized to be
8 appropriated to the Secretary of Commerce
9 \$1,191,955,000 for the National Institute of Stand-
10 ards and Technology for fiscal year 2015.

11 (2) SPECIFIC ALLOCATIONS.—Of the amount
12 authorized under paragraph (1)—

13 (A) \$782,800,000 shall be authorized for
14 scientific and technical research and services
15 laboratory activities;

16 (B) \$133,000,000 shall be authorized for
17 the construction and maintenance of facilities;
18 and

19 (C) \$276,155,000 shall be authorized for
20 industrial technology services activities, of
21 which—

22 (i) \$80,000,000 shall be authorized
23 for the Technology Innovation Program
24 under section 28 of the National Institute

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1 of Standards and Technology Act (15
2 U.S.C. 278n);

3 (ii) \$184,900,000 shall be authorized
4 for the Manufacturing Extension Partner-
5 ship program under sections 25 and 26 of
6 such Act (15 U.S.C. 278k and 278l); and

7 (iii) \$11,255,000 shall be authorized
8 for the Malcolm Baldrige National Quality
9 Award program under section 17 of the
10 Stevenson-Wylder Technology Innovation
11 Act of 1980 (15 U.S.C. 3711a).

Page 145, line 17, strike “shared-use” and insert
“user”.

Page 145, after line 24, insert the following:

12 (b) ADDITIONAL DUTIES.—The Director may assign
13 additional duties to the operational units listed in sub-
14 section (a) that are consistent with the missions of such
15 units.

Page 145, line 25, strike “(b)” and insert “(c)”.

Page 147, line 8, strike “to international” and insert
“to the development of international”.

Page 189, lines 15 and 16, strike “Office of Advanced Scientific Computing Research” and insert “Advanced Scientific Computing Research program”.

Page 190, lines 5 and 7, strike “Director” and insert “Secretary”.

Page 194, line 19, strike “REGIONAL AND GLOBAL CLIMATE” and insert “CLIMATE AND EARTH”.

Page 207, line 21, through page 209, line 23, amend section 611 to read as follows:

1 **SEC. 611. AUTHORIZATION OF APPROPRIATIONS.**

2 There are authorized to be appropriated to the Sec-
3 retary for the activities of the Office of Science—

4 (1) \$5,247,000,000 for fiscal year 2011, of
5 which—

6 (A) \$1,875,000,000 shall be for Basic En-
7 ergy Sciences activities under section 604;

8 (B) \$667,000,000 shall be for Biological
9 and Environmental Research activities under
10 section 605; and

11 (C) \$466,000,000 shall be for Advanced
12 Scientific Computing Research activities under
13 section 606;

14 (2) \$5,614,000,000 for fiscal year 2012, of
15 which—

1 (A) \$2,025,000,000 shall be for Basic En-
2 ergy Sciences activities under section 604;

3 (B) \$720,000,000 shall be for Biological
4 and Environmental Research activities under
5 section 605; and

6 (C) \$503,000,000 shall be for Advanced
7 Scientific Computing Research activities under
8 section 606;

9 (3) \$6,007,000,000 for fiscal year 2013, of
10 which—

11 (A) \$2,187,000,000 shall be for Basic En-
12 ergy Sciences activities under section 604;

13 (B) \$778,000,000 shall be for Biological
14 and Environmental Research activities under
15 section 605; and

16 (C) \$544,000,000 shall be for Advanced
17 Scientific Computing Research activities under
18 section 606;

19 (4) \$6,428,000,000 for fiscal year 2014, of
20 which—

21 (A) \$2,362,000,000 shall be for Basic En-
22 ergy Sciences activities under section 604;

23 (B) \$840,000,000 shall be for Biological
24 and Environmental Research activities under
25 section 605; and

1 (C) \$587,000,000 shall be for Advanced
2 Scientific Computing Research activities under
3 section 606; and

4 (5) \$6,878,000,000 for fiscal year 2015, of
5 which—

6 (A) \$2,551,000,000 shall be for Basic En-
7 ergy Sciences activities under section 604;

8 (B) \$907,000,000 shall be for Biological
9 and Environmental Research activities under
10 section 605; and

11 (C) \$634,000,000 shall be for Advanced
12 Scientific Computing Research activities under
13 section 606.

Page 211, lines 17 through 23, amend paragraph

(1) to read as follows:

14 “(1) IN GENERAL.—The Director shall establish
15 and maintain within ARPA-E a staff with sufficient
16 qualifications and expertise to enable ARPA-E to
17 carry out its responsibilities under this section in
18 conjunction with the operations of the rest of the
19 Department.”.

Page 216, lines 14 through 25, amend paragraph

(2) to read as follows:

1 “(2) AUTHORIZATION OF APPROPRIATIONS.—
2 Subject to paragraph (4), there are authorized to be
3 appropriated to the Director for deposit in the
4 Fund, without fiscal year limitation—
5 “(A) \$300,000,000 for fiscal year 2011;
6 “(B) \$450,000,000 for fiscal year 2012;
7 “(C) \$600,000,000 for fiscal year 2013;
8 “(D) \$800,000,000 for fiscal year 2014;
9 “(E) \$1,000,000,000 for fiscal year 2015;
10 and
11 “(F) such sums as are necessary for each
12 of fiscal years 2016 through 2020.”.

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AMENDMENT TO THE AMENDMENT IN THE
NATURE OF A SUBSTITUTE TO H.R. 5116
OFFERED BY MR. Hall

Amend section 404(a)(3) to read as follows:

- 1 (3) The Engineering Laboratory, whose mission
- 2 is to develop and disseminate advanced manufac-
- 3 turing and construction technologies to the United
- 4 States manufacturing and construction industries
- 5 through activities including measurement science re-
- 6 search, performance metrics, tools for engineering
- 7 applications, and promotion of standards adoption.



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AMENDMENT
OFFERED BY MR. BROUN OF GEORGIA TO THE
AMENDMENT OFFERED BY MR. GORDON OF
TENNESSEE

In lieu of the matter proposed to be inserted as section 212, insert the following:

1 SEC. 212. AUTHORIZATION OF APPROPRIATIONS.

2 (a) IN GENERAL.—There are authorized to be appro-
3 priated to the Foundation \$6,872,510,000 for each of the
4 fiscal years 2011 through 2013.

5 (b) SPECIFIC ALLOCATIONS.—Of the amount author-
6 ized under subsection (a) for each fiscal year—

7 (1) \$5,563,920,400 shall be made available for
8 research and related activities;

9 (2) \$872,760,000 shall be made available for
10 education and human resources;

11 (3) \$117,290,000 shall be made available for
12 major research equipment and facilities construction;

13 (4) \$300,000,000 shall be made available for
14 agency operations and award management;

15 (5) \$4,540,000 shall be made available for the
16 Office of the National Science Board; and

1 (6) \$14,000,000 shall be made available for the
2 Office of Inspector General.

In lieu of the matter proposed to be inserted as section 402, insert the following:

3 **SEC. 402. AUTHORIZATION OF APPROPRIATIONS.**

4 (a) IN GENERAL.—There are authorized to be appropriated to the Secretary of Commerce \$856,600,000 for
5 the National Institute of Standards and Technology for
6 each of the fiscal years 2011 through 2013.

8 (b) SPECIFIC ALLOCATIONS.—Of the amount authorized under subsection (a) for each fiscal year—

10 (1) \$515,000,000 shall be authorized for scientific and technical research and services laboratory
11 activities;

13 (2) \$120,000,000 shall be authorized for the construction and maintenance of facilities; and

15 (3) \$194,600,000 shall be authorized for industrial technology services activities, of which—

17 (A) \$70,000,000 shall be authorized for the Technology Innovation Program under section 28 of the National Institute of Standards
18 and Technology Act (15 U.S.C. 278n);

21 (B) \$124,700,000 shall be authorized for the Manufacturing Extension Partnership pro-

1 gram under sections 25 and 26 of such Act (15
2 U.S.C. 278k and 278l); and

3 (C) \$9,600,000 shall be authorized for the
4 Malcolm Baldrige National Quality Award pro-
5 gram under section 17 of the Stevenson-Wydler
6 Technology Innovation Act of 1980 (15 U.S.C.
7 3711a).

In lieu of the matter proposed to be inserted as sec-
tion 611, insert the following:

8 **SEC. 611. AUTHORIZATION OF APPROPRIATIONS.**

9 There are authorized to be appropriated to the Sec-
10 retary for the activities of the Office of Science
11 \$4,904,000,000 for each of the fiscal years 2011 through
12 2013, of which for each fiscal year—

13 (1) \$1,637,000,000 shall be for Basic Energy
14 Sciences activities under section 604;

15 (2) \$604,000,000 shall be for Biological and
16 Environmental Research activities under section
17 605; and

18 (3) \$394,000,000 shall be for Advanced Sci-
19 entific Computing Research activities under section
20 606.

Page 16, lines 1 through 12, amend paragraph (2)
to read as follows:

1 “(2) AUTHORIZATION OF APPROPRIATIONS.—
2 Subject to paragraph (4), there are authorized to be
3 appropriated to the Director for deposit in the
4 Fund, without fiscal year limitation, \$15,000,000
5 for each of the fiscal years 2011 through 2013.”.



AMENDMENT
OFFERED BY MR. MARIO DIAZ-BALART OF FLOR-
IDA TO THE AMENDMENT OFFERED BY MR.
GORDON OF TENNESSEE

In lieu of the matter proposed to be inserted as section 212, insert the following:

1 **SEC. 212. AUTHORIZATION OF APPROPRIATIONS.**

2 (a) FISCAL YEAR 2011.—

3 (1) IN GENERAL.—There are authorized to be
4 appropriated to the Foundation \$7,380,349,400 for
5 fiscal year 2011.

6 (2) SPECIFIC ALLOCATIONS.—Of the amount
7 authorized under paragraph (1)—

8 (A) \$5,953,395,400 shall be made avail-
9 able for research and related activities;

10 (B) \$933,853,200 shall be made available
11 for education and human resources;

12 (C) \$165,190,000 shall be made available
13 for major research equipment and facilities con-
14 struction;

15 (D) \$309,000,000 shall be made available
16 for agency operations and award management;

1 (E) \$4,630,800 shall be made available for
2 the Office of the National Science Board; and

3 (F) \$14,280,000 shall be made available
4 for the Office of Inspector General.

5 (b) FISCAL YEAR 2012.—

6 (1) IN GENERAL.—There are authorized to be
7 appropriated to the Foundation \$8,056,592,069 for
8 fiscal year 2012.

9 (2) SPECIFIC ALLOCATIONS.—Of the amount
10 authorized under paragraph (1)—

11 (A) \$6,370,133,078 shall be made avail-
12 able for research and related activities;

13 (B) \$999,222,924 shall be made available
14 for education and human resources;

15 (C) \$234,680,000 shall be made available
16 for major research equipment and facilities con-
17 struction;

18 (D) \$318,270,000 shall be made available
19 for agency operations and award management;

20 (E) \$4,723,416 shall be made available for
21 the Office of the National Science Board; and

22 (F) \$14,565,600 shall be made available
23 for the Office of Inspector General.

24 (c) FISCAL YEAR 2013.—

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3

1 (1) IN GENERAL.—There are authorized to be
 2 appropriated to the Foundation \$8,537,315,188 for
 3 fiscal year 2013.

4 (2) SPECIFIC ALLOCATIONS.—Of the amount
 5 authorized under paragraph (1)—

6 (A) \$6,816,042,393 shall be made avail-
 7 able for research and related activities;

8 (B) \$1,069,168,529 shall be made avail-
 9 able for education and human resources;

10 (C) \$183,040,000 shall be made available
 11 for major research equipment and facilities con-
 12 struction;

13 (D) \$327,818,100 shall be made available
 14 for agency operations and award management;

15 (E) \$4,817,884 shall be made available for
 16 the Office of the National Science Board; and

17 (F) \$14,856,912 shall be made available
 18 for the Office of Inspector General.

In lieu of the matter proposed to be inserted as sec-
 tion 402, insert the following:

19 **SEC. 402. AUTHORIZATION OF APPROPRIATIONS.**

20 (a) FISCAL YEAR 2011.—

21 (1) IN GENERAL.—There are authorized to be
 22 appropriated to the Secretary of Commerce

1 \$873,050,000 for the National Institute of Stand-
2 ards and Technology for fiscal year 2011.

3 (2) SPECIFIC ALLOCATIONS.—Of the amount
4 authorized under paragraph (1)—

5 (A) \$534,700,000 shall be authorized for
6 scientific and technical research and services
7 laboratory activities;

8 (B) \$125,000,000 shall be authorized for
9 the construction and maintenance of facilities;
10 and

11 (C) \$213,350,000 shall be authorized for
12 industrial technology services activities, of
13 which—

14 (i) \$70,000,000 shall be authorized
15 for the Technology Innovation Program
16 under section 28 of the National Institute
17 of Standards and Technology Act (15
18 U.S.C. 278n);

19 (ii) \$133,750,000 shall be authorized
20 for the Manufacturing Extension Partner-
21 ship program under sections 25 and 26 of
22 such Act (15 U.S.C. 278k and 278l); and

23 (iii) \$9,600,000 shall be authorized
24 for the Malcolm Baldrige National Quality
25 Award program under section 17 of the

1 Stevenson-Wydler Technology Innovation
2 Act of 1980 (15 U.S.C. 3711a).

3 (b) FISCAL YEAR 2012.—

4 (1) IN GENERAL.—There are authorized to be
5 appropriated to the Secretary of Commerce
6 \$874,494,500 for the National Institute of Stand-
7 ards and Technology for fiscal year 2012.

8 (2) SPECIFIC ALLOCATIONS.—Of the amount
9 authorized under paragraph (1)—

10 (A) \$566,782,000 shall be authorized for
11 scientific and technical research and services
12 laboratory activities;

13 (B) \$85,000,000 shall be authorized for
14 the construction and maintenance of facilities;
15 and

16 (C) \$222,712,500 shall be authorized for
17 industrial technology services activities, of
18 which—

19 (i) \$70,000,000 shall be authorized
20 for the Technology Innovation Program
21 under section 28 of the National Institute
22 of Standards and Technology Act (15
23 U.S.C. 278n);

24 (ii) \$143,112,500 shall be authorized
25 for the Manufacturing Extension Partner-

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6

1 ship program under sections 25 and 26 of
2 such Act (15 U.S.C. 278k and 278l); and
3 (iii) \$9,600,000 shall be authorized
4 for the Malcolm Baldrige National Quality
5 Award program under section 17 of the
6 Stevenson-Wydler Technology Innovation
7 Act of 1980 (15 U.S.C. 3711a).

8 (c) FISCAL YEAR 2013.—

9 (1) IN GENERAL.—There are authorized to be
10 appropriated to the Secretary of Commerce
11 \$955,519,295 for the National Institute of Stand-
12 ards and Technology for fiscal year 2013.

13 (2) SPECIFIC ALLOCATIONS.—Of the amount
14 authorized under paragraph (1)—

15 (A) \$600,788,920 shall be authorized for
16 scientific and technical research and services
17 laboratory activities;

18 (B) \$122,000,000 shall be authorized for
19 the construction and maintenance of facilities;
20 and

21 (C) \$232,730,375 shall be authorized for
22 industrial technology services activities, of
23 which—

24 (i) \$70,000,000 shall be authorized
25 for the Technology Innovation Program

1 under section 28 of the National Institute
2 of Standards and Technology Act (15
3 U.S.C. 278n);

4 (ii) \$153,130,375 shall be authorized
5 for the Manufacturing Extension Partner-
6 ship program under sections 25 and 26 of
7 such Act (15 U.S.C. 278k and 278l); and

8 (iii) \$9,600,000 shall be authorized
9 for the Malcolm Baldrige National Quality
10 Award program under section 17 of the
11 Stevenson-Wydler Technology Innovation
12 Act of 1980 (15 U.S.C. 3711a).

In lieu of the matter proposed to be inserted as sec-
tion 611, insert the following:

13 **SEC. 611. AUTHORIZATION OF APPROPRIATIONS.**

14 There are authorized to be appropriated to the Sec-
15 retary for the activities of the Office of Science—

16 (1) \$5,247,000,000 for fiscal year 2011, of
17 which—

18 (A) \$1,752,000,000 shall be for Basic En-
19 ergy Sciences activities under section 604;

20 (B) \$646,000,000 shall be for Biological
21 and Environmental Research activities under
22 section 605; and

1 (C) \$422,000,000 shall be for Advanced
2 Scientific Computing Research activities under
3 section 606;

4 (2) \$5,614,000,000 for fiscal year 2012, of
5 which—

6 (A) \$1,874,000,000 shall be for Basic En-
7 ergy Sciences activities under section 604;

8 (B) \$692,000,000 shall be for Biological
9 and Environmental Research activities under
10 section 605; and

11 (C) \$451,000,000 shall be for Advanced
12 Scientific Computing Research activities under
13 section 606;

14 (3) \$6,007,000,000 for fiscal year 2013, of
15 which—

16 (A) \$2,005,000,000 shall be for Basic En-
17 ergy Sciences activities under section 604;

18 (B) \$740,000,000 shall be for Biological
19 and Environmental Research activities under
20 section 605; and

21 (C) \$483,000,000 shall be for Advanced
22 Scientific Computing Research activities under
23 section 606.

Page 16, lines 1 through 12, amend paragraph (2)
to read as follows:

1 “(2) AUTHORIZATION OF APPROPRIATIONS.—
2 Subject to paragraph (4), there are authorized to be
3 appropriated to the Director for deposit in the
4 Fund, without fiscal year limitation, \$300,000,000
5 for each of the fiscal years 2011 through 2013.”.



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AMENDMENT

OFFERED BY MR. MARIO DIAZ-BALART OF FLORIDA TO THE AMENDMENT OFFERED BY MR. GORDON OF TENNESSEE

In the matter proposed for insertion in sections 212, 402, 611, and 622, strike all authorization of appropriations for fiscal years after fiscal year 2013.



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AMENDMENT

**OFFERED BY MR. ROHRABACHER OF CALIFORNIA
TO THE AMENDMENT OFFERED BY MR. GOR-
DON OF TENNESSEE**

In the matter proposed to be inserted on page 216,
lines 14 through 25, strike lines 8 through 12 (and make
the necessary conforming changes).

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AMENDMENT

**OFFERED BY MR. ROHRABACHER OF CALIFORNIA
TO THE AMENDMENT OFFERED BY MR. GOR-
DON OF TENNESSEE**

In the matter proposed to be inserted on page 216,
lines 14 through 25, strike lines 11 and 12 (and make
the necessary conforming changes).



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AMENDMENT

OFFERED BY MRS. BIGGERT OF ILLINOIS TO THE
AMENDMENT OFFERED BY MR. GORDON OF
TENNESSEE

Page 16, lines 5 through 10, amend subparagraphs
(A) through (E) to read as follows:

- 1 “(A) \$300,000,000 for fiscal year 2011;
- 2 “(B) \$400,000,000 for fiscal year 2012;
- 3 “(C) \$500,000,000 for fiscal year 2013;
- 4 “(D) \$600,000,000 for fiscal year 2014;
- 5 “(E) \$700,000,000 for fiscal year 2015;
- 6 and”.



**AMENDMENT TO THE AMENDMENT IN THE
NATURE OF A SUBSTITUTE
OFFERED BY MS. EDDIE BERNICE JOHNSON OF
TEXAS**

Page 61, after line 4, insert the following new section:

1 **SEC. 124. FULFILLING THE POTENTIAL OF WOMEN IN ACADEMIC SCIENCE AND ENGINEERING.**
2

3 (a) **DEFINITION.**—In this section, the term “Federal
4 science agency” means any Federal agency that is respon-
5 sible for at least 2 percent of total Federal research and
6 development funding to institutions of higher education,
7 according to the most recent data available from the Na-
8 tional Science Foundation.

9 (b) **WORKSHOPS TO ENHANCE GENDER EQUITY IN**
10 **ACADEMIC SCIENCE AND ENGINEERING.**—

11 (1) **IN GENERAL.**—Not later than 6 months
12 after the date of enactment of this Act, the Director
13 of the Office of Science and Technology Policy shall
14 develop a uniform policy for all Federal science
15 agencies to carry out a program of workshops that
16 educate program officers, members of grant review
17 panels, institution of higher education STEM de-

1 department chairs, and other federally funded re-
2 searchers about methods that minimize the effects of
3 gender bias in evaluation of Federal research grants
4 and in the related academic advancement of actual
5 and potential recipients of these grants, including
6 hiring, tenure, promotion, and selection for any
7 honor based in part on the recipient's research
8 record.

9 (2) INTERAGENCY COORDINATION.—The Direc-
10 tor of the Office of Science and Technology Policy
11 shall ensure that programs of workshops across the
12 Federal science agencies are coordinated and sup-
13 ported jointly as appropriate. As part of this proc-
14 ess, the Director of the Office of Science and Tech-
15 nology Policy shall ensure that at least 1 workshop
16 is supported every 2 years among the Federal
17 science agencies in each of the major science and en-
18 gineering disciplines supported by those agencies.

19 (3) ORGANIZATIONS ELIGIBLE TO CARRY OUT
20 WORKSHOPS.—Federal science agencies may carry
21 out the program of workshops under this subsection
22 by making grants to eligible organizations. In addi-
23 tion to any other organizations made eligible by the
24 Federal science agencies, the following organizations
25 are eligible for grants under this subsection:

1 (A) Nonprofit scientific and professional
2 societies and organizations that represent one
3 or more STEM disciplines.

4 (B) Nonprofit organizations that have the
5 primary mission of advancing the participation
6 of women in STEM.

7 (4) CHARACTERISTICS OF WORKSHOPS.—The
8 workshops shall have the following characteristics:

9 (A) Invitees to workshops shall include at
10 least—

11 (i) the chairs of departments in the
12 relevant discipline from at least the top 50
13 institutions of higher education, as deter-
14 mined by the amount of Federal research
15 and development funds obligated to each
16 institution of higher education in the prior
17 year based on data available from the Na-
18 tional Science Foundation;

19 (ii) members of any standing research
20 grant review panel appointed by the Fed-
21 eral science agencies in the relevant dis-
22 cipline;

23 (iii) in the case of science and engi-
24 neering disciplines supported by the De-
25 partment of Energy, the individuals from

1 each of the Department of Energy Na-
2 tional Laboratories with personnel manage-
3 ment responsibilities comparable to those
4 of an institution of higher education de-
5 partment chair; and

6 (iv) Federal science agency program
7 officers in the relevant discipline, other
8 than program officers that participate in
9 comparable workshops organized and run
10 specifically for that agency's program offi-
11 cers.

12 (B) Activities at the workshops shall in-
13 clude research presentations and interactive dis-
14 cussions or other activities that increase the
15 awareness of the existence of gender bias in the
16 grant-making process and the development of
17 the academic record necessary to qualify as a
18 grant recipient, including recruitment, hiring,
19 tenure review, promotion, and other forms of
20 formal recognition of individual achievement,
21 and provide strategies to overcome such bias.

22 (C) Research presentations and other
23 workshop programs, as appropriate, shall in-
24 clude a discussion of the unique challenges

1 faced by women who are members of histori-
2 cally underrepresented groups.

3 (D) Workshop programs shall include in-
4 formation on best practices and the value of
5 mentoring undergraduate and graduate women
6 students as well as outreach to girls earlier in
7 their STEM education.

8 (5) REPORT.—

9 (A) IN GENERAL.—Not later than 5 years
10 after the date of enactment of this Act, the Di-
11 rector of the Office of Science and Technology
12 Policy shall transmit to the Committee on
13 Science and Technology of the House of Rep-
14 resentatives and the Committee on Commerce,
15 Science, and Transportation of the Senate a re-
16 port evaluating the effectiveness of the program
17 carried out under this subsection to reduce gen-
18 der bias towards women engaged in research
19 funded by the Federal Government. The Direc-
20 tor of the Office of Science and Technology Pol-
21 icy shall include in this report any recommenda-
22 tions for improving the evaluation process de-
23 scribed in subparagraph (B).

24 (B) MINIMUM CRITERIA FOR EVALUA-
25 TION.—In determining the effectiveness of the

1 program, the Director of the Office of Science
2 and Technology Policy shall consider, at a min-
3 imum—

4 (i) the rates of participation by
5 invitees in the workshops authorized under
6 this subsection;

7 (ii) the results of attitudinal surveys
8 conducted on workshop participants before
9 and after the workshops;

10 (iii) any relevant institutional policy
11 or practice changes reported by partici-
12 pants; and

13 (iv) for individuals described in para-
14 graph (4)(A)(i) or (iii) who participated in
15 at least 1 workshop 3 or more years prior
16 to the due date for the report, trends in
17 the data for the department represented by
18 the chair or employee including faculty
19 data related to gender as described in sec-
20 tion 216.

21 (C) INSTITUTIONAL ATTENDANCE AT
22 WORKSHOPS.—As part of the report under sub-
23 paragraph (A), the Director of the Office of
24 Science and Technology Policy shall include a
25 list of institutions of higher education science

1 and engineering departments whose representa-
2 tives attended the workshops required under
3 this subsection.

4 (6) MINIMIZING COSTS.—To the extent prac-
5 ticable, workshops shall be held in conjunction with
6 national or regional disciplinary meetings to mini-
7 mize costs associated with participant travel.

8 (c) EXTENDED RESEARCH GRANT SUPPORT AND IN-
9 TERIM TECHNICAL SUPPORT FOR CAREGIVERS.—

10 (1) POLICIES FOR CAREGIVERS.—Not later
11 than 6 months after the date of enactment of this
12 Act, the Director of the Office of Science and Tech-
13 nology Policy shall develop a uniform policy to—

14 (A) extend the period of grant support for
15 federally funded researchers who have
16 caregiving responsibilities; and

17 (B) provide funding for interim technical
18 staff support for federally funded researchers
19 who take a leave of absence for caregiving re-
20 sponsibilities.

21 (2) REPORT.—Upon developing the policy re-
22 quired under paragraph (1), the Director of the Of-
23 fice of Science and Technology Policy shall transmit
24 a copy of the policy to the Committee on Science
25 and Technology of the House of Representatives and

1 to the Committee on Commerce, Science, and Trans-
2 portation of the Senate.

3 (d) COLLECTION OF DATA ON FEDERAL RESEARCH
4 GRANTS.—

5 (1) IN GENERAL.—Each Federal science agency
6 shall collect standardized annual composite informa-
7 tion on demographics, field, award type and budget
8 request, review score, and funding outcome for all
9 applications for research and development grants to
10 institutions of higher education supported by that
11 agency.

12 (2) REPORTING OF DATA.—

13 (A) The Director of the Office of Science
14 and Technology Policy shall establish a policy
15 to ensure uniformity and standardization of
16 data collection required under paragraph (1).

17 (B) Not later than 2 years after the date
18 of enactment of this Act, and annually there-
19 after, each Federal science agency shall submit
20 data collected under paragraph (1) to the Na-
21 tional Science Foundation.

22 (C) The National Science Foundation shall
23 be responsible for storing and publishing all of
24 the grant data submitted under subparagraph
25 (B) in conjunction with the biennial report re-

1 (5) faculty years in rank by gender, race, and
2 age;

3 (6) faculty attrition by gender, race, and age;

4 (7) the number and percent of faculty hired by
5 rank, gender, race, and age; and

6 (8) the number and percent of faculty in leader-
7 ship positions, including endowed or named chairs,
8 serving on promotion and tenure committees, by
9 gender, race, and age.

10 (b) RECOMMENDATIONS.—The Director shall solicit
11 input and recommendations from relevant stakeholders,
12 including representatives from institutions of higher edu-
13 cation and nonprofit organizations, on the collection of
14 data required under subsection (a), including the develop-
15 ment of standard definitions on the terms and categories
16 to be used in the collection of such data.

17 (c) REPORT TO CONGRESS.—Not later than 2 years
18 after the date of enactment of this Act, the Director shall
19 submit a report to Congress on how the Foundation will
20 gather the demographic data on STEM faculty, includ-
21 ing—

22 (1) a description of the data to be reported and
23 the sources of those data;

24 (2) justification for the exclusion of any data
25 described in paragraph (1); and

1 (3) a list of the definitions for the terms and
2 categories, such as “faculty” and “leadership posi-
3 tions”, to be applied in the reporting of all data de-
4 scribed in paragraph (1).



**AMENDMENT TO THE AMENDMENT IN THE
NATURE OF A SUBSTITUTE
OFFERED BY MS. DAHLKEMPER OF
PENNSYLVANIA**

Page 73, line 21, insert “**AND EDUCATION**” after
“**RESEARCH**”.

Page 73, line 22, insert “(a) **MANUFACTURING RE-
SEARCH.—**” before “The Director”.

Page 74, after line 13, insert the following new sub-
section:

1 (b) **MANUFACTURING EDUCATION.—**In order to help
2 ensure a well-trained manufacturing workforce, the Direc-
3 tor shall award grants to strengthen and expand scientific
4 and technical education and training in advanced manu-
5 facturing, including through the Foundation’s Advanced
6 Technological Education program.



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**AMENDMENT TO THE AMENDMENT IN THE
NATURE OF A SUBSTITUTE**

OFFERED BY Mr Inglis

Page 83, line 7, strike "and".

Page 83, line 11, strike the period and insert ";
and".

Page 83, after line 11, insert the following new
paragraph:

- 1 (4) shall not have utilized Federal funds to en-
- 2 gage in the research for which the prize is being
- 3 awarded.



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AMENDMENT TO THE AMENDMENT IN THE

NATURE OF A SUBSTITUTE

OFFERED BY Mr. Hall

At the end of subtitle B of title II, add the following
new section:

1 SEC. 229. REPEAL OF ACADEMIC RESEARCH FACILITIES

2 MODERNIZATION PROGRAM.

3 The Academic Research Facilities Modernization Act

4 of 1988 (42 U.S.C. 1862a et seq.) is repealed.



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**AMENDMENT TO THE AMENDMENT IN THE
NATURE OF A SUBSTITUTE**

OFFERED BY Mr. Neugebauer

Page 91, line 3, strike “(a) SECTION 10 AMEND-
MENTS.—”.

Page 91, lines 21 through 24, strike subsection (b).



AMENDMENT TO THE AMENDMENT IN THE

NATURE OF A SUBSTITUTE

OFFERED BY Mr. Neugebauer

Page 91, after line 5, insert the following new paragraph (and make the necessary conforming changes):

- 1 (1) in subsection (a)(3), by adding at the end
2 the following:
3 “No portion of Federal funds awarded under this
4 section may be used by an institution of higher edu-
5 cation to engage in capacity building activities.”.



AMENDMENT TO THE AMENDMENT IN THE

NATURE OF A SUBSTITUTE

OFFERED BY Mr. Neugebauer OF TEXAS

Page 91, line 24, insert “, and by striking ‘which may be provided in cash or in-kind’ and inserting ‘which shall be provided in cash’” before the period at the end.



**AMENDMENT TO THE AMENDMENT IN THE
NATURE OF A SUBSTITUTE
OFFERED BY MR. EHLERS OF MICHIGAN**

Page 99, line 6, strike “and”.

Page 99, line 14, strike the period and insert “;
and”.

Page 99, after line 14, insert the following new
paragraph:

1 (9) support for initiatives that advance the inte-
2 gration of global challenges such as sustainability
3 into disciplinary and interdisciplinary STEM edu-
4 cation.



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**AMENDMENT TO THE AMENDMENT IN THE
NATURE OF A SUBSTITUTE
OFFERED BY MR. WILSON OF OHIO**

Page 109, line 8, insert “, and students in rural
schools” after “1885b”).



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AMENDMENT TO THE AMENDMENT IN THE
NATURE OF A SUBSTITUTE
OFFERED BY MR. BARTLETT

In section 253—

- (1) insert “(a)” before “Section 7026”; and
- (2) add at the end the following new subsection:

1 (b) Subparagraphs (B), (C), (D), (E), and (F) of sec-
2 tion 8(8) of the National Science Foundation Act of 2002
3 are repealed.



**AMENDMENT TO THE AMENDMENT IN THE
NATURE OF A SUBSTITUTE
OFFERED BY MR. WU OF OREGON**

Page 115, after line 4, insert the following new section:

1 **SEC. 254. STEM INDUSTRY INTERNSHIP PROGRAMS.**

2 (a) **IN GENERAL.**—The Director shall award grants,
3 on a competitive, merit-reviewed basis, to institutions of
4 higher education, or consortia thereof, to establish or ex-
5 pand partnerships with local or regional private sector en-
6 tities, for the purpose of providing undergraduate students
7 with integrated internship experiences that connect private
8 sector internship experiences with the students' STEM
9 coursework. Such partnerships may also include industry
10 or professional associations.

11 (b) **PRIORITY.**—In awarding grants under this sec-
12 tion, the Director shall give priority consideration to insti-
13 tutions of higher education or consortia thereof that dem-
14 onstrate significant outreach to and coordination with
15 local or regional private sector entities in developing aca-
16 demic courses designed to provide students with the skills
17 necessary for employment in local or regional companies.

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1 (c) REPORT.—Not less than 3 years after the date
2 of enactment of this Act, the Director shall submit a re-
3 port to Congress on the number and total value of awards
4 made under this section, the number of students affected
5 by those awards, and any evidence of the effect of those
6 awards on workforce preparation and jobs placement for
7 participating students.



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AMENDMENT

OFFERED BY MR. BARTLETT OF MARYLAND TO
 THE AMENDMENT OFFERED BY MR. WU OF
 OREGON

Page 1, line 2, strike "shall" and insert "may".

Page 1, line 12, strike "consideration".

Page 2, line 1, redesignate subsection (c) as sub-
 section (e).

Page 1, after line 17, insert the following new sub-
 sections:

1 (c) COST-SHARE.—The Director shall require a 50
 2 percent non-Federal cost-share from partnerships estab-
 3 lished or expanded under this section.

4 (d) RESTRICTION.—No Federal funds provided under
 5 this section may be used—

6 (1) for the purpose of providing stipends or
 7 compensation to students for private sector intern-
 8 ships; or

9 (2) as payment or reimbursement to private
 10 sector entities.



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**AMENDMENT TO THE AMENDMENT IN THE
NATURE OF A SUBSTITUTE
OFFERED BY MR. LUJÁN OF NEW MEXICO**

Page 115, after line 4, insert the following new section:

1 **SEC. 254. TRIBAL COLLEGES AND UNIVERSITIES PROGRAM.**

2 (a) IN GENERAL.—The Director shall continue to
3 support a program to award grants on a competitive,
4 merit-reviewed basis to tribal colleges and universities (as
5 defined in section 316 of the Higher Education Act of
6 1965 (20 U.S.C. 1059c)), including institutions described
7 in section 317 of such Act (20 U.S.C. 1059d), to enhance
8 the quality of undergraduate STEM education at such in-
9 stitutions and to increase the retention and graduation
10 rates of Native American students pursuing associate's or
11 baccalaureate degrees in STEM.

12 (b) PROGRAM COMPONENTS.—Grants awarded under
13 this section shall support—

- 14 (1) activities to improve courses and curriculum
15 in STEM;
- 16 (2) faculty development;
- 17 (3) stipends for undergraduate students partici-
18 pating in research; and

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- 1 (4) other activities consistent with subsection
- 2 (a), as determined by the Director.
- 3 (c) INSTRUMENTATION.—Funding provided under
- 4 this section may be used for instrumentation.



**AMENDMENT TO THE AMENDMENT IN THE
NATURE OF A SUBSTITUTE
OFFERED BY MR. MARIO DIAZ-BALART OF
FLORIDA**

In section 303(c), in the matter proposed to be inserted as section 5004(g) of the America COMPETES Act, strike all authorization of appropriations for fiscal years after fiscal year 2013.

In section 502, in the matter proposed to be inserted as section 25(s) of the Stevenson-Wydler Technology Innovation Act of 1980, strike “fiscal years 2011 through 2015” and insert “fiscal years 2011 through 2013”.

In section 503, in the matter proposed to be inserted as section 26(g) of the Stevenson-Wydler Technology Innovation Act of 1980, strike “fiscal years 2011 through 2015” and insert “fiscal years 2011 through 2013”.

In section 632, strike all authorization of appropriations for fiscal years after fiscal year 2013.



**AMENDMENT TO THE AMENDMENT IN THE
NATURE OF A SUBSTITUTE
OFFERED BY MR. MCCAUL OF TEXAS**

Page 135, after line 6, insert the following new section:

1 **SEC. 304. GREEN ENERGY EDUCATION.**

2 (a) **SHORT TITLE.**—This section may be cited as the
3 “Green Energy Education Act of 2010”.

4 (b) **DEFINITION.**—For the purposes of this section:

5 (1) **DIRECTOR.**—The term “Director” means
6 the Director of the National Science Foundation.

7 (2) **HIGH PERFORMANCE BUILDING.**—The term
8 “high performance building” has the meaning given
9 that term in section 914(a) of the Energy Policy Act
10 of 2005 (42 U.S.C. 16194(a)).

11 (c) **GRADUATE TRAINING IN ENERGY RESEARCH
12 AND DEVELOPMENT.**—

13 (1) **FUNDING.**—In carrying out research, devel-
14 opment, demonstration, and commercial application
15 activities authorized for the Department of Energy,
16 the Secretary may contribute funds to the National
17 Science Foundation for the Integrative Graduate
18 Education and Research Traineeship program to

1 support projects that enable graduate education re-
2 lated to such activities.

3 (2) CONSULTATION.—The Director shall con-
4 sult with the Secretary when preparing solicitations
5 and awarding grants for projects described in para-
6 graph (1).

7 (d) CURRICULUM DEVELOPMENT FOR HIGH PER-
8 FORMANCE BUILDING DESIGN.—

9 (1) FUNDING.—In carrying out advanced en-
10 ergy technology research, development, demonstra-
11 tion, and commercial application activities author-
12 ized for the Department of Energy related to high
13 performance buildings, the Secretary may contribute
14 funds to curriculum development activities at the
15 National Science Foundation for the purpose of im-
16 proving undergraduate or graduate interdisciplinary
17 engineering and architecture education related to the
18 design and construction of high performance build-
19 ings, including development of curricula, of labora-
20 tory activities, of training practicums, or of design
21 projects. A primary goal of curriculum development
22 activities supported under this subsection shall be to
23 improve the ability of engineers, architects, land-
24 scape architects, and planners to work together on
25 the incorporation of advanced energy technologies

1 during the design and construction of high perform-
2 ance buildings.

3 (2) CONSULTATION.—The Director shall con-
4 sult with the Secretary when preparing solicitations
5 and awarding grants for projects described in para-
6 graph (1).

7 (3) PRIORITY.—In awarding grants with re-
8 spect to which the Secretary has contributed funds
9 under this subsection, the Director shall give priority
10 to applications from departments, programs, or cen-
11 ters of a school of engineering that are partnered
12 with schools, departments, or programs of design,
13 architecture, landscape architecture, and city, re-
14 gional, or urban planning.



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**AMENDMENT TO THE AMENDMENT IN THE
NATURE OF A SUBSTITUTE TO H.R. 5116
OFFERED BY MR. Hall**

Amend section 404(a)(3) to read as follows:

- 1 (3) The Engineering Laboratory, whose mission
2 is to develop and disseminate advanced manufac-
3 turing and construction technologies to the United
4 States manufacturing and construction industries
5 through activities including measurement science re-
6 search, performance metrics, tools for engineering
7 applications, and promotion of standards adoption.



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**AMENDMENT TO THE AMENDMENT IN THE
NATURE OF A SUBSTITUTE TO H.R. 5116
OFFERED BY M.C. Brown**

Strike title V and redesignate subsequent provisions
(and amend the table of contents) accordingly.



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**AMENDMENT TO THE AMENDMENT IN THE
NATURE OF A SUBSTITUTE TO H.R. 5116
OFFERED BY MR. EHLERS OF MICHIGAN**

Page 169, strike lines 8 through 11 and insert the following:

1 “(1) criteria that the Secretary shall use to de-
2 termine eligibility for loan guarantees under this sec-
3 tion, including—

4 “(A) whether a borrower is a small- or me-
5 dium-sized manufacturer; and

6 “(B) whether a borrower demonstrates
7 that a market exists for the innovative tech-
8 nology product, or the integral component of
9 such product, to be manufactured, as evidenced
10 by written statements of interest from potential
11 purchasers;



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**AMENDMENT TO THE AMENDMENT IN THE
NATURE OF A SUBSTITUTE TO H.R. 5116
OFFERED BY MR. BARTLETT OF MARYLAND**

Page 170, after line 24, insert the following (and re-designate subsequent provisions accordingly):

1 “(r) MINIMIZING RISK.—The Secretary shall promul-
2 gate regulations and policies to carry out this section in
3 accordance with Office of Management and Budget Cir-
4 cular No. A-129, entitled ‘Policies for Federal Credit Pro-
5 grams and Non-Tax Receivables’, as in effect on the date
6 of enactment of this section.”



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**AMENDMENT TO THE AMENDMENT IN THE
NATURE OF A SUBSTITUTE TO H.R. 5116
OFFERED BY MR. BILBRAY OF CALIFORNIA**

Page 170, after line 24, insert the following (and re-designate subsequent provisions accordingly):

1 “(r) SENSE OF CONGRESS.—It is the Sense of Con-
2 gress that no loan guarantee shall be made under this sec-
3 tion unless the borrower agrees to use a federally-approved
4 electronic employment eligibility verification system to
5 verify the employment eligibility of—

6 “(1) all persons hired during the contract term
7 by the borrower to perform employment duties with-
8 in the United States; and

9 “(2) all persons assigned by the borrower to
10 perform work within the United States on the
11 project.



**AMENDMENT TO THE AMENDMENT IN THE
NATURE OF A SUBSTITUTE
OFFERED BY MR. LIPINSKI OF ILLINOIS**

Page 183, after line 2, insert the following new sub-section:

1 (g) DOMESTICALLY SOURCED HARDWARE.—

2 (1) PLAN.—The Director shall develop a plan
3 to increase the percentage of domestically sourced
4 hardware for planned and ongoing projects of the
5 Department of Energy. In developing this plan, the
6 Director shall—

7 (A) give consideration to technologies that
8 the United States does not currently have the
9 capacity to manufacture and to procurement ac-
10 tivities that can strengthen United States high-
11 technology competitiveness broadly;

12 (B) seek opportunities to engage and part-
13 ner with domestic manufacturers; and

14 (C) annually assess levels of domestically
15 available goods relevant to planned and ongoing
16 projects of the Office of Science.

17 (2) INTERNATIONAL AGREEMENTS.—This sub-
18 section shall be applied in a manner consistent with

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1 United States obligations under international agree-
2 ments.

3 (3) REPORT TO CONGRESS.—Not later than 1
4 year after the date of enactment of this Act, the Di-
5 rector shall transmit the plan developed under this
6 subsection to the Committee on Energy and Natural
7 Resources of the Senate and the Committee on
8 Science and Technology of the House of Representa-
9 tives, and shall transmit any appropriate updates to
10 those committees.

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**AMENDMENT TO THE AMENDMENT IN THE
NATURE OF A SUBSTITUTE
OFFERED BY MRS. BIGGERT OF ILLINOIS**

Page ~~225~~, after line ~~8~~, add the following new sub-
183 2
section:

(g)
1 (g) MERIT-REVIEWED STUDY.—As part of the Presi-
2 dent's annual budget request, the Secretary shall include
3 a detailed summary of the degree to which current re-
4 search activities are competitive and merit-reviewed, in-
5 cluding a list of activities that would have been undertaken
6 in the absence of Congressionally-directed projects and an
7 analysis of the effects of increasing the proportion of com-
8 petitive, merit-reviewed activities on the strategic objec-
9 tives of the Office of Science.



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**AMENDMENT TO THE AMENDMENT IN THE
NATURE OF A SUBSTITUTE
OFFERED BY MR. INGLIS OF SOUTH CAROLINA**

Page 186, line 24, insert "including hydrogen,"
after "liquid transportation fuels,".



**AMENDMENT TO THE AMENDMENT IN THE
NATURE OF A SUBSTITUTE**

OFFERED BY Mr. Smith of Nebraska

Page 187, after line 10, insert the following new paragraph (and make the necessary conforming changes):

1 (2) RESEARCH PLAN.—(A) Not later than 1
2 year after the date of enactment of this Act, the Di-
3 rector shall prepare and transmit to Congress a re-
4 search plan describing how the activities authorized
5 under this subsection will be undertaken.

6 (B) In developing the plan in subparagraph
7 (A), the Director may utilize an existing research
8 plan and update such plan to incorporate the activi-
9 ties identified in paragraph (1).

10 (C) Not later than 3 years after the initial re-
11 port under this paragraph, and at least once every
12 3 years thereafter, the Director shall update the re-
13 search plan and transmit it to Congress.

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AMENDMENT TO THE AMENDMENT IN THE

NATURE OF A SUBSTITUTE

OFFERED BY Mr. Olson OF TEXAS

Page 190, line 22, through page 195, line 12, strike
subsection (c).



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**AMENDMENT TO THE AMENDMENT IN THE
NATURE OF A SUBSTITUTE
OFFERED BY MR. NEUGEBAUER OF TEXAS**

Page 210, after line 8, insert the following new paragraph (and make the necessary conforming changes):

- 1 (1) in subsection (c)(1)—
- 2 (A) by striking “and” at the end of sub-
- 3 paragraph (A)(iii);
- 4 (B) by striking the period at the end of
- 5 subparagraph (B) and inserting “; and”; and
- 6 (C) by adding at the end the following:
- 7 “(C) to ensure that, of the projects funded
- 8 under this section, those with a high potential
- 9 to result in technology advances that enable re-
- 10 ductions in imports of energy from foreign
- 11 sources receive the highest priority consider-
- 12 ation from the Director.”;



**AMENDMENT TO THE AMENDMENT IN THE
NATURE OF A SUBSTITUTE
OFFERED BY MR. SMITH OF NEBRASKA**

Page 210, after line 25, insert the following new paragraph (and make the necessary conforming changes):

- 1 (3) in subsection (e)—
- 2 (A) by striking “and” at the end of para-
- 3 graph (3)(D);
- 4 (B) by striking the period at the end of
- 5 paragraph (4) and inserting “; and”; and
- 6 (C) by adding at the end the following new
- 7 paragraph:
- 8 “(5) pursuant to subsection (e)(2)(C)—
- 9 “(A) ensuring that applications for funding
- 10 disclose the extent of current and prior efforts,
- 11 including monetary investments as appropriate,
- 12 in pursuit of the technology area for which
- 13 funding is being requested;
- 14 “(B) adopting measures to ensure that, in
- 15 making awards, program managers adhere to
- 16 the objectives in subsection (e)(2)(C); and
- 17 “(C) providing as part of the annual report
- 18 required by subsection (h)(1) a summary of the

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1 instances of and reasons for ARPA-E funding
2 projects in technology areas already being un-
3 dertaken by industry.”

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**AMENDMENT TO THE AMENDMENT IN THE
NATURE OF A SUBSTITUTE
OFFERED BY MR. OLSON OF TEXAS**

In section 622(4), in the proposed subsection (f), strike "shall" and insert "may".

In section 622(5), strike subparagraph (F) (and make the necessary conforming changes).



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AMENDMENT TO THE AMENDMENT IN THE

NATURE OF A SUBSTITUTE

OFFERED BY Ms. Biggart

Page 223, line 1, strike "(1) IN GENERAL.—".

Page 223, lines 7 through 15, strike paragraph (2).



**AMENDMENT TO THE AMENDMENT IN THE
NATURE OF A SUBSTITUTE
OFFERED BY MS. EDDIE BERNICE JOHNSON OF
TEXAS**

Page 223, after line 18, insert the following new subsection (and redesignate the subsequent subsections accordingly):

1 (g) PRIORITY CONSIDERATION.—The Secretary shall
2 give priority consideration to applications in which 1 or
3 more of the institutions under subsection (b)(1)(A) are
4 1890 Land Grant Institutions (as defined in section 2 of
5 the Agricultural Research, Extension, and Education Re-
6 form Act of 1998 (7 U.S.C. 7061)), Predominantly Black
7 Institutions (as defined in section 318 of the Higher Edu-
8 cation Act of 1965 (20 U.S.C. 1059e)), Tribal Colleges
9 or Universities (as defined in section 316(b) of the Higher
10 Education Act of 1965 (20 U.S.C. 1059c(b)), or Hispanic
11 Serving Institutions (as defined in section 318 of the
12 Higher Education Act of 1965 (20 U.S.C. 1059e)).



**AMENDMENT TO THE AMENDMENT IN THE
NATURE OF A SUBSTITUTE
OFFERED BY MR. HALL OF TEXAS**

In section 632(g)(1)—

- (1) strike “or” at the end of subparagraph (C);
- (2) strike the period at the end of subparagraph (D) and insert “; and”; and
- (3) add at the end the following new subparagraph:

- 1 (E) that enhances the energy independence
- 2 and security of the United States by enabling
- 3 improved or expanded supply and production of
- 4 domestic energy resources, including coal, oil,
- 5 and natural gas.



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**AMENDMENT TO THE AMENDMENT IN THE
NATURE OF A SUBSTITUTE
OFFERED BY MR. PETERS OF MICHIGAN**

Page 224, line 3, strike "or".

Page 224, line 4, redesignate subparagraph (D) as
subparagraph (E).

Page 224, after line 3, insert the following new sub-
paragraph:

1 (D) that enables advanced vehicles, vehicle
2 components, and related technologies that re-
3 sult in significant energy savings; or



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**AMENDMENT TO THE AMENDMENT IN THE
NATURE OF A SUBSTITUTE
OFFERED BY MRS. BIGGERT OF ILLINOIS**

Page 224, line 17, insert “, including the Department of Energy Federally Funded Research and Development Centers” after “Federal entity”.



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**AMENDMENT TO THE AMENDMENT IN THE
NATURE OF A SUBSTITUTE
OFFERED BY MR. LUJÁN OF NEW MEXICO**

At the end of the bill, add the following new subtitle:

1 **Subtitle D—Cooperative Research**
2 **and Development Fund**

3 **SEC. 641. SHORT TITLE.**

4 This subtitle may be cited as the “Cooperative Re-
5 search and Development Fund Authorization Act of
6 2010”.

7 **SEC. 642. COOPERATIVE RESEARCH AND DEVELOPMENT**
8 **FUND.**

9 (a) **IN GENERAL.**—The Secretary of Energy shall
10 make funds available to Department of Energy National
11 Laboratories for the Federal share of cooperative research
12 and development agreements. The Secretary of Energy
13 shall determine the apportionment of such funds to each
14 Department of Energy National Laboratory and shall en-
15 sure that special consideration is given to small business
16 firms and consortia involving small business firms in the
17 selection process for which cooperative research and devel-
18 opment agreements will receive such funds.

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1 (b) REPORTING.—Each year the Secretary shall sub-
2 mit to Congress a report that describes how funds were
3 expended under this subtitle.

4 (c) AUTHORIZATION OF APPROPRIATIONS.—There
5 are authorized to be appropriated to the Secretary such
6 sums as are necessary to carry out this section each fiscal
7 year.



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AMENDMENT

OFFERED BY MRS. BIGGERT OF ILLINOIS TO THE
AMENDMENT OFFERED BY MR. LUJAN OF
NEW MEXICO

Page 2, line 7, insert "No funds allocated for this section shall come from funds allocated for the Office of Science." after "fiscal year."



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**AMENDMENT TO THE AMENDMENT IN THE
NATURE OF A SUBSTITUTE
OFFERED BY MR. BARTLETT OF MARYLAND**

At the end of the bill, add the following new title:

1 TITLE VII—SENSE OF CONGRESS

2 SEC. 701. SENSE OF CONGRESS.

3 It is the sense of Congress that, among the programs
4 and activities authorized in this Act, those that correspond
5 to the recommendations of the National Academy of
6 Sciences' 2005 report entitled "Rising Above the Gath-
7 ering Storm" remain critical to maintaining long-term
8 United States economic competitiveness, and accordingly
9 shall receive funding priority.



AMENDMENT TO THE AMENDMENT IN THE

NATURE OF A SUBSTITUTE

OFFERED BY MR. BROWN OF GEORGIA

At the end of the bill, add the following new title:

1 **TITLE VII—PROHIBITION ON**
 2 **LOBBYING**

3 **SEC. 701. PROHIBITION ON LOBBYING.**

4 (a) IN GENERAL.—None of the funds authorized to
 5 be appropriated pursuant to the amendments made by this
 6 title may be used to lobby any person or entity.

7 (b) DEFINITION.—For purposes of this section, the
 8 term “lobby” means to directly or indirectly pay for any
 9 personal service, advertisement, telegram, telephone, let-
 10 ter, printed or written matter, or other device, intended
 11 or designed to influence in any manner a Member of Con-
 12 gress, a jurisdiction, or an official of any government, to
 13 favor, adopt, or oppose, by vote or otherwise, any legisla-
 14 tion, law, ratification, policy, or appropriation of funds,
 15 whether before or after the introduction of any bill, meas-
 16 ure, or resolution proposing such legislation, law, ratifica-
 17 tion, policy, or appropriation.



AMENDMENT TO THE AMENDMENT IN THE
NATURE OF A SUBSTITUTE

OFFERED BY Mr. Hall

At the end of the bill, add the following new title:

1 **TITLE VII—PERSONS WITH**
2 **DISABILITIES**

3 **SEC. 701. PERSONS WITH DISABILITIES.**

4 For the purposes of the activities and programs sup-
5 ported by this Act and the amendments made by this Act,
6 institutions of higher education chartered to serve large
7 numbers of students with disabilities, including Gallaudet
8 University, Landmark College, and the National Technical
9 Institute for the Deaf and those with programs serving
10 or those serving disabled veterans, shall receive special
11 consideration and have a designation consistent with the
12 designation for other institutions that serve populations
13 underrepresented in STEM to ensure that institutions of
14 higher education chartered to or serving persons with dis-
15 abilities benefit from such activities and programs.



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AMENDMENT TO THE AMENDMENT IN THE
NATURE OF A SUBSTITUTE
OFFERED BY Mr. Hall

At the end of the bill, add the following new title:

1 **TITLE VII—VETERANS AND**
2 **SERVICE MEMBERS**

3 **SEC. 701. VETERANS AND SERVICE MEMBERS.**

4 In awarding scholarships and fellowships under this
5 Act, an institution of higher education shall give pref-
6 erence to applications from veterans and service members,
7 including those who have received or will receive the Af-
8 ghanistan Campaign Medal or the Iraq Campaign Medal
9 as authorized by Public Law 108-234 (10 U.S.C. 1121
10 note; 118 Stat. 655) and Executive Order No. 13363.



**AMENDMENT TO THE AMENDMENT IN THE
NATURE OF A SUBSTITUTE
OFFERED BY MR. NEUGEBAUER OF TEXAS**

At the end of the bill, insert the following new title:

1 **TITLE VII—EFFECTIVE DATE**

2 **SEC. 701. EFFECTIVE DATE.**

3 (a) IN GENERAL.—Notwithstanding sections 212,
4 303, 402, 502, 503, 611, 622, and 632, no funds are au-
5 thorized to be appropriated for activities under those sec-
6 tions in amounts that exceed authorizations for such pur-
7 poses for fiscal year 2010 before the end of the first fiscal
8 year for which the Director of the Congressional Budget
9 Office certifies to the Congress in writing that the Federal
10 Government does not have a budget deficit. The Director
11 of the Congressional Budget Office shall monitor the
12 budget deficit of the Federal Government for purposes of
13 this section and shall make a determination and certifi-
14 cation with respect to each fiscal year not later than the
15 October 1 that occurs immediately after the end of such
16 fiscal year.

17 (b) DEFINITIONS.—For purposes of this section:

18 (1) The term “budget deficit” means, with re-
19 spect to a fiscal year, that for the fiscal year the

1 total outlays of the Government, excluding outlays
2 from Social Security programs, exceeded the total
3 receipts of the Government, excluding receipts from
4 Social Security programs.

5 (2) The term "Social Security programs"
6 means the Federal Old-Age and Survivors Insurance
7 Trust Fund and the Federal Disability Insurance
8 Trust Fund.



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**AMENDMENT TO THE AMENDMENT IN THE
NATURE OF A SUBSTITUTE
OFFERED BY MR. NEUGEBAUER OF TEXAS**

At the end of the bill, insert the following new title:

1 **TITLE VII—EFFECTIVE DATE**

2 **SEC. 701. EFFECTIVE DATE.**

3 (a) IN GENERAL.—This Act and any regulations
4 issued under this Act shall take effect upon the first Janu-
5 ary 1 occurring after the date of the enactment of this
6 Act and after the conclusion of a fiscal year in which the
7 Federal Government did not have a budget deficit.

8 (b) DEFINITIONS.—For purposes of this section:

9 (1) The term “budget deficit” means, with re-
10 spect to a fiscal year, that for the fiscal year the
11 total outlays of the Government, excluding outlays
12 from Social Security programs, exceeded the total
13 receipts of the Government, excluding receipts from
14 Social Security programs.

15 (2) The term “Social Security programs”
16 means the Federal Old-Age and Survivors Insurance
17 Trust Fund and the Federal Disability Insurance
18 Trust Fund.



**AMENDMENT TO THE AMENDMENT IN THE
NATURE OF A SUBSTITUTE
OFFERED BY MR. ROHRABACHER OF CALIFORNIA**

At the end of the bill, insert the following new title:

1 **TITLE VII—LIMITATION ON USE**
2 **OF FUNDS**

3 **SEC. 701. LIMITATION ON USE OF FUNDS.**

4 No funds authorized in this Act may be used for a
5 project unless—

6 (1) all persons receiving funds are United
7 States citizens; and

8 (2) all entities receiving funds are
9 headquartered in the United States.



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**AMENDMENT TO THE AMENDMENT IN THE
NATURE OF A SUBSTITUTE
OFFERED BY MR. ROHRABACHER OF CALIFORNIA**

At the end of the bill, insert the following new title:

1 **TITLE VII—LIMITATION ON USE**
2 **OF FUNDS**

3 **SEC. 701. LIMITATION ON USE OF FUNDS.**

4 No funds authorized in this Act may be used for re-
5 search and development unless all entities involved in such
6 research and development agree not to use any developed
7 and related technologies for manufacturing outside of the
8 United States.



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**AMENDMENT TO THE AMENDMENT IN THE
NATURE OF A SUBSTITUTE
OFFERED BY MR. ROHRABACHER OF CALIFORNIA**

At the end of the bill, insert the following new title:

1 **TITLE VII—LIMITATION ON USE**
2 **OF FUNDS**

3 **SEC. 701. LIMITATION ON USE OF FUNDS.**

4 No funds authorized in this Act may be provided to
5 any person or entity found guilty of infringing on the pat-
6 ent rights of any other person or entity.



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**AMENDMENT TO THE AMENDMENT IN THE
NATURE OF A SUBSTITUTE
OFFERED BY MR. ROHRBACHER OF CALIFORNIA**

At the end of the bill, insert the following new title:

1 **TITLE VII—INTELLECTUAL**
2 **PROPERTY RIGHTS**

3 **SEC. 701. INTELLECTUAL PROPERTY RIGHTS.**

4 Intellectual property rights from technologies devel-
5 oped using funds authorized in this Act shall be appor-
6 tioned to the granting agency in direct proportion of the
7 funds granted to the total project cost.



AMENDMENT TO THE AMENDMENT IN THE

NATURE OF A SUBSTITUTE

OFFERED BY MR. BRAUN OF GEORGIA

At the end of the bill, add the following new title:

1 **TITLE VII—PROHIBITION ON**
2 **LOBBYING**

3 **SEC. 701. PROHIBITION ON LOBBYING.**

4 (a) IN GENERAL.—None of the funds authorized to
5 be appropriated pursuant to the amendments made by this
6 title may be used to lobby any person or entity.

7 (b) DEFINITION.—For purposes of this section, the
8 term “lobby” means to directly or indirectly pay for any
9 personal service, advertisement, telegram, telephone, let-
10 ter, printed or written matter, or other device, intended
11 or designed to influence in any manner a Member of Con-
12 gress, a jurisdiction, or an official of any government, to
13 favor, adopt, or oppose, by vote or otherwise, any legisla-
14 tion, law, ratification, policy, or appropriation of funds,
15 whether before or after the introduction of any bill, meas-
16 ure, or resolution proposing such legislation, law, ratifica-
17 tion, policy, or appropriation.



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AMENDMENT TO THE AMENDMENT IN THE

NATURE OF A SUBSTITUTE

OFFERED BY MR. BROWN of Georgia

Strike sections 228, 407, 502, and 503, and subtitle C of title VI (and make the necessary conforming changes).

In section 406, strike subsections (b) and (c) (and make the necessary conforming changes).



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**AMENDMENT TO THE AMENDMENT IN THE
NATURE OF A SUBSTITUTE**

OFFERED BY MR. BILBRAY OF CALIFORNIA AND
MR. CARAMENDI OF CALIFORNIA

Page 202, after line 4, insert the following new sub-
section (and make the necessary conforming changes):

- 1 (e) ENABLING TECHNOLOGY DEVELOPMENT.—The
- 2 Director shall carry out activities to develop technologies
- 3 necessary to enable the reliable, sustainable, safe, and eco-
- 4 nomically competitive operation of a commercial fusion
- 5 power plant.



**AMENDMENT TO THE AMENDMENT IN THE
NATURE OF A SUBSTITUTE
OFFERED BY MR. BARTLETT OF MARYLAND**

Page 215, line 8, through page 216, line 2, amend subsection (k) to read as follows:

1. “(k) EVENTS.—
- 2 “(1) The Director is authorized to convene, or-
- 3 ganize, and sponsor events that further the objec-
- 4 tives of ARPA-E, including events that assemble
- 5 awardees, the most promising applicants for ARPA-
- 6 E funding, and a broad range of ARPA-E stake-
- 7 holders (which may include members of relevant sci-
- 8 entific research and academic communities, govern-
- 9 ment officials, financial institutions, private inves-
- 10 tors, entrepreneurs, and other private entities), for
- 11 the purposes of—
- 12 “(A) demonstrating projects of ARPA-E
- 13 awardees;
- 14 “(B) demonstrating projects of finalists for
- 15 ARPA-E awards and other energy technology
- 16 projects;
- 17 “(C) facilitating discussion of the commer-
- 18 cial application of energy technologies developed

1 under ARPA-E and other government-spon-
2 sored research and development programs; or

3 “(D) such other purposes as the Director
4 considers appropriate.

5 “(2) Funding for activities described in para-
6 graph (1) shall be provided as part of the technology
7 transfer and outreach activities authorized under
8 subsection (o)(4)(B).”

