

ENERGY RESEARCH, DEVELOPMENT, DEMONSTRATION,  
AND COMMERCIAL APPLICATION ACT OF 2003

—————  
MAY 22, 2003.—Ordered to be printed  
—————

Mr. BOEHLERT, from the Committee on Science,  
submitted the following

R E P O R T

together with

AN ADDITIONAL VIEW

[To accompany H.R. 238]

[Including cost estimate of the Congressional Budget Office]

The Committee on Science, to whom was referred the bill (H.R. 238) to provide for Federal energy research, development, demonstration, and commercial application activities, and for other purposes, having considered the same, report favorably thereon with an amendment and recommend that the bill as amended do pass.

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I. AMENDMENT

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 “Energy Research, Development, Demonstration, and Commercial Application Act of 2003”.

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

- Sec. 1. Short title; table of contents.
- Sec. 2. Purposes.
- Sec. 3. Goals.
- Sec. 4. Definitions.

TITLE I—RESEARCH AND DEVELOPMENT

Subtitle A—Energy Efficiency

PART 1—AUTHORIZATION OF APPROPRIATIONS

Sec. 104. Energy efficiency.

PART 2—LIGHTING SYSTEMS

Sec. 105. Next Generation Lighting Initiative.

PART 3—BUILDINGS

Sec. 106. National Building Performance Initiative.

Sec. 106A. Electric motor control technology.

PART 4—VEHICLES

Sec. 107. Definitions.

Sec. 108. Establishment of secondary electric vehicle battery use program.

PART 5—ENERGY EFFICIENCY SCIENCE INITIATIVE

Sec. 110. Energy Efficiency Science Initiative.

PART 6—ADVANCED ENERGY TECHNOLOGY TRANSFER CENTERS

Sec. 110A. Advanced energy technology transfer centers.

Subtitle B—Distributed Energy and Electric Energy Systems

PART 1—AUTHORIZATION OF APPROPRIATIONS

Sec. 111. Distributed energy and electric energy systems.

Sec. 111A. Demonstration and field test.

PART 2—DISTRIBUTED POWER

Sec. 112. Strategy.

Sec. 113. High power density industry program.

Sec. 114. Micro-cogeneration energy technology.

PART 3—TRANSMISSION SYSTEMS

Sec. 115. Transmission infrastructure systems research, development, demonstration, and commercial application.

PART 4—GENERAL PROVISIONS

Sec. 116. Definitions.

Sec. 117. Voluntary consensus standards.

Subtitle C—Renewable Energy

PART 1—AUTHORIZATION OF APPROPRIATIONS

Sec. 121. Renewable energy.

PART 2—BIOENERGY

Sec. 122. Bioenergy programs.

PART 3—MISCELLANEOUS PROJECTS

Sec. 126. Miscellaneous projects.

Sec. 127. Renewable energy in public buildings.

Subtitle D—Nuclear Energy

PART 1—AUTHORIZATION OF APPROPRIATIONS

Sec. 131. Nuclear energy.

## PART 2—NUCLEAR ENERGY RESEARCH PROGRAMS

Sec. 132. Nuclear energy research programs.

## PART 3—ADVANCED FUEL RECYCLING

Sec. 133. Advanced fuel recycling program.

## PART 4—UNIVERSITY PROGRAMS

Sec. 134. University nuclear science and engineering support.

## PART 5—GEOLOGICAL ISOLATION OF SPENT FUEL

Sec. 135. Geological isolation of spent fuel.

## Subtitle E—Fossil Energy

## PART 1—AUTHORIZATION OF APPROPRIATIONS

Sec. 141. Fossil energy.

## PART 2—RESEARCH PROGRAMS

Sec. 142. Fossil energy research programs.

Sec. 143. Research and development for coal mining technologies.

## PART 3—ULTRA-DEEPWATER AND UNCONVENTIONAL NATURAL GAS AND OTHER PETROLEUM RESOURCES

Sec. 144. Program authority.

Sec. 145. Ultra-deepwater program.

Sec. 146. Unconventional natural gas and other petroleum resources program.

Sec. 147. Additional requirements for awards.

Sec. 148. Advisory committees.

Sec. 149. Limits on participation.

Sec. 150. Fund.

Sec. 150A. Transfer of advanced oil and gas exploration and production technologies.

Sec. 151. Sunset.

Sec. 152. Definitions.

## Subtitle F—Science

## PART 1—AUTHORIZATION OF APPROPRIATIONS

Sec. 161. Science.

## PART 2—FUSION ENERGY SCIENCES

Sec. 161A. ITER.

Sec. 162. Plan for fusion experiment.

Sec. 163. Plan for fusion energy sciences program.

## PART 3—SPALLATION NEUTRON SOURCE

Sec. 164. Definition.

Sec. 165. Report.

Sec. 166. Limitations.

## PART 4—MISCELLANEOUS

Sec. 167. Facility and infrastructure support for nonmilitary energy laboratories.

Sec. 168. Research regarding precious metal catalysis.

Sec. 169. Nanotechnology research and development.

Sec. 170. Advanced scientific computing for energy missions.

Sec. 170A. Nitrogen fixation.

## PART 5—GENOMES TO LIFE

Sec. 170B. Genomes to Life.

Sec. 170C. Department of Energy Science and Technology Scholarship Program.

## Subtitle G—Energy and Environment

Sec. 171. Authorization of appropriations.

Sec. 172. United States-Mexico energy technology cooperation.

Sec. 173. Waste reduction and use of alternatives.

Sec. 174. Coal gasification.

Sec. 175. Petroleum coke gasification.

Sec. 176. Other biopower and bioenergy.

Sec. 177. Coal technology loan.

Sec. 178. Fuel cell test center.

## Subtitle H—Hydrogen

Sec. 181. Short title.

Sec. 182. Matsunaga Act amendment.

Sec. 183. Repeal of Hydrogen Future Act of 1996.

## Subtitle I—Management

Sec. 184. Availability of funds.

Sec. 185. Cost sharing.

Sec. 186. Merit review of proposals.

Sec. 187. External technical review of departmental programs.

Sec. 188. Improved coordination of technology transfer activities.

Sec. 189. Small business advocacy and assistance.

Sec. 190. Mobility of scientific and technical personnel.

- Sec. 191. National Academy of Sciences report.
- Sec. 192. Outreach.
- Sec. 193. Limits on use of funds.
- Sec. 194. Reprogramming.
- Sec. 195. Construction with other laws.
- Sec. 196. University collaboration.
- Sec. 197. Federal laboratory educational partners.
- Sec. 198. Interagency cooperation.

#### TITLE II—DEPARTMENT OF ENERGY MANAGEMENT

- Sec. 201. Improved coordination and management of civilian science and technology programs.
- Sec. 202. Report on equal employment opportunity practices.
- Sec. 203. External regulation of Department of Energy.

#### TITLE III—CLEAN SCHOOL BUSES

- Sec. 301. Establishment of pilot program.
- Sec. 302. Fuel cell bus development and demonstration program.
- Sec. 303. Diesel retrofit program.
- Sec. 304. Authorization of appropriations.

#### TITLE IV—ALTERNATIVE FUELED AND ADVANCED VEHICLES

- Sec. 401. Definitions.
- Sec. 402. Pilot program.
- Sec. 403. Reports to Congress.
- Sec. 404. Fuel cell transit bus demonstration.
- Sec. 405. Authorization of appropriations.

#### TITLE V—CLEAN COAL

- Sec. 501. Authorization of appropriations.
- Sec. 502. Project criteria.
- Sec. 503. Report.
- Sec. 504. Clean coal centers of excellence.

### SEC. 2. PURPOSES.

The purposes of this Act are to—

- (1) contribute to a national energy strategy through an energy research and development program that supports basic energy research and provides mechanisms to develop, demonstrate, and promote the commercial application of new energy technologies in partnership with industry;
- (2) protect and strengthen the Nation's economy, standard of living, and national security by reducing dependence on imported energy;
- (3) meet future needs for energy services at the lowest total cost to the Nation, giving balanced and comprehensive consideration to technologies that improve the efficiency of energy end uses and that enhance energy supply;
- (4) reduce the environmental impacts of energy production, distribution, transportation, and use;
- (5) help increase domestic production of energy, increase the availability of hydrocarbon reserves, and lower energy prices; and
- (6) stimulate economic growth and enhance the ability of United States companies to compete in future markets for advanced energy technologies.

### SEC. 3. GOALS.

(a) IN GENERAL.—In order to achieve the purposes of this Act, the Secretary shall conduct a balanced set of programs of energy research, development, demonstration, and commercial application, guided by the following goals:

#### (1) ENERGY EFFICIENCY.—

(A) BUILDINGS.—Develop, in partnership with industry, technologies, designs, and production methods that will enable an average 25 percent increase by 2010 in the energy efficiency of all new buildings, as compared to a new building in 1996.

(B) INDUSTRY.—Develop, in partnership with industry, technologies, designs, and production methods that will enable the energy intensity of the major energy-consuming industries to improve by at least 25 percent by 2010 as compared to 1991.

(C) VEHICLES.—Develop, in partnership with industry, technologies that will enable—

- (i) by 2010, mid-sized passenger automobiles with a fuel economy of 80 miles per gallon;
- (ii) by 2010, light trucks (classes 1 and 2a) with a fuel economy of 60 miles per gallon;
- (iii) by 2010, medium trucks and buses (classes 2b through 6 and class 8 transit buses) with a fuel economy, in ton-miles per gallon for trucks and passenger miles per gallon for buses, that is 3 times that of year 2000 equivalent vehicles;

(iv) by 2010, heavy trucks (classes 7 and 8) with a fuel economy, in ton-miles per gallon, that is 2 times that of year 2000 equivalent vehicles; and

(v) by 2020, meeting the goal described in section 103(a)(2) of the Spark M. Matsunaga Hydrogen Research, Development, and Demonstration Act of 1990.

(2) DISTRIBUTED ENERGY AND ELECTRIC ENERGY SYSTEMS.—

(A) DISTRIBUTED GENERATION.—Develop, in partnership with industry, technologies based on natural gas that achieve electricity generating efficiencies greater than 40 percent by 2015 for on-site, or distributed, generation technologies.

(B) ELECTRIC ENERGY SYSTEMS AND STORAGE.—Develop, in partnership with industry—

(i) technologies for generators and transmission, distribution, and storage systems that combine high capacity with high efficiency (particularly for electric transmission facilities in rural and remote areas);

(ii) new transmission and distribution technologies, including flexible alternating current transmission systems, composite conductor materials, advanced protection devices, and controllers;

(iii) technologies for interconnection of distributed energy resources with electric power systems;

(iv) high-temperature superconducting materials for power delivery equipment such as transmission and distribution cables, transformers, and generators; and

(v) real-time transmission and distribution system control technologies that provide for continual exchange of information between generation, transmission, distribution, and end-user facilities.

(3) RENEWABLE ENERGY.—

(A) WIND POWER.—Develop, in partnership with industry, technologies and designs that will—

(i) reduce the cost of wind power by 40 percent by 2012 as compared to 2000; and

(ii) expand utilization of class 3 and 4 winds.

(B) PHOTOVOLTAICS.—Develop, in partnership with industry, total photovoltaic systems with installed costs of \$5,000 per peak kilowatt by 2005 and \$2000 per peak kilowatt by 2015.

(C) SOLAR THERMAL SYSTEMS.—Develop, in partnership with industry, solar power technologies (including baseload solar power) that combine high-efficiency and high-temperature receivers with advanced thermal storage and power cycles to accommodate peak loads and reduce lifecycle costs.

(D) GEOTHERMAL ENERGY.—Develop, in partnership with industry, technologies and processes based on advanced hydrothermal systems and advanced heat and power systems, including geothermal or ground source heat pump technology, with a specific focus on—

(i) improving exploration and characterization technology to increase the probability of drilling successful wells from 20 percent to 40 percent by 2010;

(ii) reducing the cost of drilling by 2008 to an average cost of \$225 per foot;

(iii) developing enhanced geothermal systems technology with the potential to double the usable geothermal resource base, as compared to the date of enactment of this Act; and

(iv) reducing the cost of installing the ground loop of ground-source heat pumps by 30 percent by 2007 compared to the cost in 2000.

(E) BIOMASS-BASED POWER SYSTEMS.—Develop, in partnership with industry, integrated power generating systems, advanced conversion, and feedstock technologies capable of producing electric power that is cost-competitive with fossil-fuel generated electricity by 2010, through co-production of fuels, chemicals, and other products under subparagraph (F).

(F) BIOFUELS.—Develop, in partnership with industry, new and emerging technologies and biotechnology processes capable of making—

(i) gaseous and liquid biofuels that are price-competitive, by 2010, with gasoline or diesel in either internal combustion engines or fuel cells; and

(ii) biofuels, biobased polymers, and chemicals, including those derived from lignocellulosic feedstock, with particular emphasis on developing biorefineries that use enzyme-based processing systems.

- (G) HYDROPOWER.—Develop, in partnership with industry, a new generation of turbine technologies that will increase generating capacity and be less damaging to fish and aquatic ecosystems.
- (4) FOSSIL ENERGY.—
- (A) POWER GENERATION.—Develop, in partnership with industry, technologies, including precombustion technologies, by 2015 with the capability of realizing—
- (i) electricity generating efficiencies of 75 percent (lower heating value) for natural gas; and
  - (ii) widespread commercial application of combined heat and power with thermal efficiencies of more than 85 percent (higher heating value).
- (B) OFFSHORE OIL AND GAS RESOURCES.—Develop, in partnership with industry, technologies to—
- (i) extract methane hydrates in coastal waters of the United States; and
  - (ii) develop natural gas and oil reserves in the ultra-deepwater of the Central and Western Gulf of Mexico, with a focus on improving, while lowering costs and reducing environmental impacts, the safety and efficiency of—
    - (I) the recovery of ultra-deepwater resources; and
    - (II) sub-sea production technology used for such recovery.
- (C) ONSHORE OIL AND GAS RESOURCES.—Advance the science and technology available to domestic onshore petroleum producers, particularly independent producers of oil or gas, through—
- (i) advances in technology for exploration and production of domestic petroleum resources, particularly those not accessible with current technology;
  - (ii) improvement in the ability to extract hydrocarbons (including heavy oil) from known reservoirs and classes of reservoirs; and
  - (iii) development of technologies and practices that reduce the impact on the environment from petroleum exploration and production.
- (D) TRANSPORTATION FUELS.—Increase the availability of transportation fuels by focusing research on—
- (i) reducing the cost of producing transportation fuels from coal and natural gas; and
  - (ii) indirect liquefaction of coal and biomass.
- (5) NUCLEAR ENERGY.—
- (A) EXISTING REACTORS.—Support research to extend the lifetimes of existing United States nuclear power reactors, and increase their reliability while optimizing their current operations for greater efficiencies.
- (B) ADVANCED REACTORS.—Develop, in partnership with industry—
- (i) advanced, efficient, lower cost, and passively safe reactor designs;
  - (ii) proliferation-resistant and high-burn-up nuclear fuels; and
  - (iii) technologies to minimize generation of radioactive materials and improve the management of nuclear waste.
- (C) NUCLEAR SCIENTISTS AND ENGINEERS.—Attract new students and faculty to the nuclear sciences, nuclear engineering, and related fields (including health physics, nuclear medicine, nuclear chemistry, and radiochemistry).
- (6) HYDROGEN.—Carry out the Spark M. Matsunaga Hydrogen Research, Development, and Demonstration Act of 1990.
- (b) REVIEW AND ASSESSMENT OF GOALS.—
- (1) EVALUATION AND MODIFICATION.—Based on amounts appropriated and developments in science and technology, the Secretary shall evaluate the goals set forth in subsection (a) at least once every 5 years, and shall report to the Congress any proposed modifications to the goals.
- (2) CONSULTATION.—In evaluating and proposing modifications to the goals as provided in paragraph (1), the Secretary shall solicit public input.
- (3) PUBLIC COMMENT.—(A) After consultation under paragraph (2), the Secretary shall publish in the Federal Register a set of draft modifications to the goals for public comment.
- (B) Not later than 60 days after the date of publication of draft modifications under subparagraph (A), and after consideration of any public comments received, the Secretary shall publish the final modifications, including a summary of the public comments received, in the Federal Register.
- (4) EFFECTIVE DATE.—No modification to goals under this section shall take effect before the date which is 5 years after the date of enactment of this Act.

(c) EFFECT OF GOALS.—(1) Nothing in paragraphs (1) through (6) of subsection (a), or any subsequent modification to the goals therein pursuant to subsection (b), shall—

(A) create any new—

- (i) authority for any Federal agency; or
- (ii) requirement for any other person;

(B) be used by a Federal agency to support the establishment of regulatory standards or regulatory requirements; or

(C) alter the authority of the Secretary to make grants or other awards.

(2) Nothing in this subsection shall be construed to limit the authority of the Secretary to impose conditions on grants or other awards based on the goals in subsection (a) or any subsequent modification thereto.

#### SEC. 4. DEFINITIONS.

For purposes of this Act:

(1) DEPARTMENT.—The term “Department” means the Department of Energy.

(2) DEPARTMENTAL MISSION.—The term “departmental mission” means any of the functions vested in the Secretary of Energy by the Department of Energy Organization Act (42 U.S.C. 7101 et seq.) or other law.

(3) INDEPENDENT PRODUCER OF OIL OR GAS.—

(A) IN GENERAL.—The term “independent producer of oil or gas” means any person who produces oil or gas other than a person to whom subsection (c) of section 613A of the Internal Revenue Code of 1986 does not apply by reason of paragraph (2) (relating to certain retailers) or paragraph (4) (relating to certain refiners) of section 613A(d) of such Code.

(B) RULES FOR APPLYING PARAGRAPHS (2) AND (4) OF SECTION 613A(d).—For purposes of subparagraph (A), paragraphs (2) and (4) of section 613A(d) of the Internal Revenue Code of 1986 shall be applied by substituting “calendar year” for “taxable year” each place it appears in such paragraphs.

(4) 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)).

(5) JOINT VENTURE.—The term “joint venture” has the meaning given that term under section 2 of the National Cooperative Research and Production Act of 1993 (15 U.S.C. 4301).

(6) NATIONAL LABORATORY.—The term “National Laboratory” means any of the following laboratories owned by the Department:

- (A) Ames National Laboratory.
- (B) Argonne National Laboratory.
- (C) Brookhaven National Laboratory.
- (D) Fermi National Laboratory.
- (E) Idaho National Engineering and Environmental Laboratory.
- (F) Lawrence Berkeley National Laboratory.
- (G) Lawrence Livermore National Laboratory.
- (H) Los Alamos National Laboratory.
- (I) National Energy Technology Laboratory.
- (J) National Renewable Energy Laboratory.
- (K) Oak Ridge National Laboratory.
- (L) Pacific Northwest National Laboratory.
- (M) Princeton Plasma Physics Laboratory.
- (N) Sandia National Laboratories.
- (O) Thomas Jefferson National Accelerator Facility.

(7) NONMILITARY ENERGY LABORATORY.—The term “nonmilitary energy laboratory” means any of the following laboratories of the Department:

- (A) Ames National Laboratory.
- (B) Argonne National Laboratory.
- (C) Brookhaven National Laboratory.
- (D) Fermi National Laboratory.
- (E) Lawrence Berkeley National Laboratory.
- (F) Oak Ridge National Laboratory.
- (G) Pacific Northwest National Laboratory.
- (H) Princeton Plasma Physics Laboratory.
- (I) Stanford Linear Accelerator Center.
- (J) Thomas Jefferson National Accelerator Facility.

(8) SECRETARY.—The term “Secretary” means the Secretary of Energy.

(9) SINGLE-PURPOSE RESEARCH FACILITY.—The term “single-purpose research facility” means any of the following primarily single-purpose entities owned by the Department:

- (A) East Tennessee Technology Park.

- (B) Fernald Environmental Management Project.
- (C) Kansas City Plant.
- (D) Nevada Test Site.
- (E) New Brunswick Laboratory.
- (F) Pantex Weapons Facility.
- (G) Savannah River Technology Center.
- (H) Stanford Linear Accelerator Center.
- (I) Y-12 facility at Oak Ridge National Laboratory.
- (J) Waste Isolation Pilot Plant.
- (K) Any other similar organization of the Department designated by the Secretary that engages in technology transfer, partnering, or licensing activities.

## **TITLE I—RESEARCH AND DEVELOPMENT**

### **Subtitle A—Energy Efficiency**

#### **PART 1—AUTHORIZATION OF APPROPRIATIONS**

##### **SEC. 104. ENERGY EFFICIENCY.**

(a) **IN GENERAL.**—The following sums are authorized to be appropriated to the Secretary for energy efficiency and conservation research, development, demonstration, and commercial application activities, including activities authorized under this subtitle:

- (1) For fiscal year 2004, \$616,000,000.
- (2) For fiscal year 2005, \$695,000,000.
- (3) For fiscal year 2006, \$772,000,000.
- (4) For fiscal year 2007, \$865,000,000.

(b) **ALLOCATIONS.**—From amounts authorized under subsection (a), the following sums are authorized:

- (1) **LIGHTING SYSTEMS.**—For activities under section 105, \$50,000,000 for each of fiscal years 2004 through 2007.
- (2) **ELECTRIC MOTOR CONTROL TECHNOLOGY.**—For activities under section 106A, \$2,000,000 for each of fiscal years 2004 through 2007.
- (3) **SECONDARY ELECTRIC VEHICLE BATTERY USE PROGRAM.**—For activities under section 108—
  - (A) for fiscal year 2004, \$4,000,000;
  - (B) for fiscal year 2005, \$7,000,000;
  - (C) for fiscal year 2006, \$7,000,000; and
  - (D) for fiscal year 2007, \$7,000,000.
- (4) **ENERGY EFFICIENCY SCIENCE INITIATIVE.**—For activities under section 110—
  - (A) for fiscal year 2004, \$20,000,000;
  - (B) for fiscal year 2005, \$25,000,000;
  - (C) for fiscal year 2006, \$30,000,000; and
  - (D) for fiscal year 2007, \$35,000,000.

(c) **EXTENDED AUTHORIZATION.**—There are authorized to be appropriated to the Secretary for activities under section 105, \$50,000,000 for each of fiscal years 2008 through 2012.

(d) **LIMITS ON USE OF FUNDS.**—None of the funds authorized to be appropriated under this section may be used for—

- (1) the promulgation and implementation of energy efficiency regulations;
- (2) the Weatherization Assistance Program under part A of title IV of the Energy Conservation and Production Act;
- (3) the State Energy Program under part D of title III of the Energy Policy and Conservation Act; or
- (4) the Federal Energy Management Program under part 3 of title V of the National Energy Conservation Policy Act.

#### **PART 2—LIGHTING SYSTEMS**

##### **SEC. 105. NEXT GENERATION LIGHTING INITIATIVE.**

(a) **IN GENERAL.**—The Secretary shall carry out a Next Generation Lighting Initiative in accordance with this section to support research, development, demonstra-

tion, and commercial application activities related to advanced solid-state lighting technologies based on white light emitting diodes.

(b) OBJECTIVES.—The objectives of the initiative shall be—

(1) to develop, by 2012, advanced solid-state lighting technologies based on white light emitting diodes that, compared to incandescent and fluorescent lighting technologies, are—

- (A) longer lasting;
- (B) more energy-efficient; and
- (C) cost-competitive;

(2) to develop an inorganic white light emitting diode that has an efficiency of 160 lumens per watt and a 10-year lifetime; and

(3) to develop an organic white light emitting diode with an efficiency of 100 lumens per watt with a 5-year lifetime that—

- (A) illuminates over a full color spectrum;
- (B) covers large areas over flexible surfaces; and
- (C) does not contain harmful pollutants, such as mercury, typical of fluorescent lamps.

(c) FUNDAMENTAL RESEARCH.—

(1) CONSORTIUM.—The Secretary shall carry out the fundamental research activities of the Next Generation Lighting Initiative through a private consortium (which may include private firms, trade associations and institutions of higher education), which the Secretary shall select through a competitive process. Each proposed consortium shall submit to the Secretary such information as the Secretary may require, including a program plan agreed to by all participants of the consortium.

(2) JOINT VENTURE.—The consortium shall be structured as a joint venture among the participants of the consortium. The Secretary shall serve on the governing council of the consortium.

(3) ELIGIBILITY.—To be eligible to be selected as the consortium under paragraph (1), an applicant must be broadly representative of United States solid-state lighting research, development, and manufacturing expertise as a whole.

(4) GRANTS.—(A) The Secretary shall award grants for fundamental research to the consortium, which the consortium may disburse to researchers, including those who are not participants of the consortium.

(B) To receive a grant, the consortium must provide a description to the Secretary of the proposed research and list the parties that will receive funding.

(C) Grants shall be matched by the consortium pursuant to section 185.

(5) NATIONAL LABORATORIES.—National Laboratories may participate in the research described in this section, and may receive funds from the consortium.

(6) INTELLECTUAL PROPERTY.—Participants in the consortium and the Federal Government shall have royalty-free nonexclusive rights to use intellectual property derived from research funded pursuant to this subsection.

(d) DEVELOPMENT, DEMONSTRATION, AND COMMERCIAL APPLICATION.—The Secretary shall carry out the development, demonstration, and commercial application activities of the Next Generation Lighting Initiative through awards to private firms, trade associations, and institutions of higher education. In selecting awardees, the Secretary may give preference to members of the consortium selected pursuant to subsection (c).

(e) PLANS AND ASSESSMENTS.—(1) The consortium shall formulate an annual operating plan which shall include research priorities, technical milestones, and plans for technology transfer, and which shall be subject to approval by the Secretary.

(2) The Secretary shall enter into an arrangement with the National Academy of Sciences to conduct periodic reviews of the Next Generation Lighting Initiative. The Academy shall review the research priorities, technical milestones, and plans for technology transfer established under paragraph (1) and evaluate the progress toward achieving them. The Secretary shall consider the results of such reviews in evaluating the plans submitted under paragraph (1).

(f) AUDIT.—The Secretary shall retain an independent, commercial auditor to perform an audit of the consortium to determine the extent to which the funds authorized by this section have been expended in a manner consistent with the purposes of this section. The auditor shall transmit a report annually to the Secretary, who shall transmit the report to the Congress, along with a plan to remedy any deficiencies cited in the report.

(g) SUNSET.—The Next Generation Lighting Initiative shall terminate no later than September 30, 2013.

(h) DEFINITIONS.—As used in this section:

(1) ADVANCED SOLID-STATE LIGHTING.—The term “advanced solid-state lighting” means a semiconducting device package and delivery system that produces white light using externally applied voltage.

(2) **FUNDAMENTAL RESEARCH.**—The term “fundamental research” includes basic research on both solid-state materials and manufacturing processes.

(3) **INORGANIC WHITE LIGHT EMITTING DIODE.**—The term “inorganic white light emitting diode” means an inorganic semiconducting package that produces white light using externally applied voltage.

(4) **ORGANIC WHITE LIGHT EMITTING DIODE.**—The term “organic white light emitting diode” means an organic semiconducting compound that produces white light using externally applied voltage.

## **PART 3—BUILDINGS**

### **SEC. 106. NATIONAL BUILDING PERFORMANCE INITIATIVE.**

(a) **INTERAGENCY GROUP.**—Not later than 3 months after the date of enactment of this Act, the Director of the Office of Science and Technology Policy shall establish an interagency group to develop, in coordination with the advisory committee established under subsection (e), a National Building Performance Initiative (in this section referred to as the “Initiative”). The interagency group shall be cochaired by appropriate officials of the Department and the Department of Commerce, who shall jointly arrange for the provision of necessary administrative support to the group.

(b) **INTEGRATION OF EFFORTS.**—The Initiative, working with the National Institute of Building Sciences, shall integrate Federal, State, and voluntary private sector efforts to reduce the costs of construction, operation, maintenance, and renovation of commercial, industrial, institutional, and residential buildings.

(c) **PLAN.**—Not later than 1 year after the date of enactment of this Act, the interagency group shall submit to Congress a plan for carrying out the appropriate Federal role in the Initiative. The plan shall be based on whole building principles and shall include—

(1) research, development, demonstration, and commercial application of systems and materials for new construction and retrofit relating to the building envelope and building system components; and

(2) the collection, analysis, and dissemination of research results and other pertinent information on enhancing building performance to industry, government entities, and the public.

(d) **DEPARTMENT OF ENERGY ROLE.**—Within the Federal portion of the Initiative, the Department shall be the lead agency for all aspects of building performance related to use and conservation of energy.

(e) **ADVISORY COMMITTEE.**—

(1) **ESTABLISHMENT.**—The Director of the Office of Science and Technology Policy shall establish an advisory committee to—

(A) analyze and provide recommendations on potential private sector roles and participation in the Initiative; and

(B) review and provide recommendations on the plan described in subsection (c).

(2) **MEMBERSHIP.**—Membership of the advisory committee shall include representatives with a broad range of appropriate expertise, including expertise in—

(A) building research and technology;

(B) architecture, engineering, and building materials and systems; and

(C) the residential, commercial, and industrial sectors of the construction industry.

(f) **CONSTRUCTION.**—Nothing in this section provides any Federal agency with new authority to regulate building performance.

### **SEC. 106A. ELECTRIC MOTOR CONTROL TECHNOLOGY.**

The Secretary shall conduct a research, development, demonstration, and commercial application program on advanced control devices to improve the energy efficiency of electric motors used in heating, ventilation, air conditioning, and comparable systems.

## **PART 4—VEHICLES**

### **SEC. 107. DEFINITIONS.**

For purposes of this part, the term—

(1) “battery” means an energy storage device that previously has been used to provide motive power in a vehicle powered in whole or in part by electricity; and

(2) “associated equipment” means equipment located where the batteries will be used that is necessary to enable the use of the energy stored in the batteries.

**SEC. 108. ESTABLISHMENT OF SECONDARY ELECTRIC VEHICLE BATTERY USE PROGRAM.**

(a) PROGRAM.—The Secretary shall establish and conduct a research, development, demonstration, and commercial application program for the secondary use of batteries. Such program shall be—

(1) designed to demonstrate the use of batteries in secondary application, including utility and commercial power storage and power quality;

(2) structured to evaluate the performance, including useful service life and costs, of such batteries in field operations, and evaluate the necessary supporting infrastructure, including reuse and disposal of batteries; and

(3) coordinated with ongoing secondary battery use programs at the National Laboratories and in industry.

(b) SOLICITATION.—(1) Not later than 6 months after the date of the enactment of this Act, the Secretary shall solicit proposals to demonstrate the secondary use of batteries and associated equipment and supporting infrastructure in geographic locations throughout the United States. The Secretary may make additional solicitations for proposals if the Secretary determines that such solicitations are necessary to carry out this section.

(2)(A) Proposals submitted in response to a solicitation under this section shall include—

(i) a description of the project, including the batteries to be used in the project, the proposed locations and applications for the batteries, the number of batteries to be demonstrated, and the type, characteristics, and estimated life-cycle costs of the batteries compared to other energy storage devices currently used;

(ii) the contribution, if any, of State or local governments and other persons to the demonstration project;

(iii) the type of associated equipment and supporting infrastructure to be demonstrated; and

(iv) any other information the Secretary considers appropriate.

(B) If the proposal includes a lease arrangement, the proposal shall indicate the terms of such lease arrangement for the batteries and associated equipment.

(c) SELECTION OF PROPOSALS.—(1)(A) The Secretary shall, not later than 3 months after the closing date established by the Secretary for receipt of proposals under subsection (b), select at least 5 proposals to receive financial assistance under this section.

(B) No one project selected under this section shall receive more than 25 percent of the funds authorized under this section. No more than 3 projects selected under this section shall demonstrate the same battery type.

(2) In selecting a proposal under this section, the Secretary shall consider—

(A) the ability of the proposer to acquire the batteries and associated equipment and to successfully manage and conduct the demonstration project, including satisfying the reporting requirements set forth in paragraph (3)(B);

(B) the geographic and climatic diversity of the projects selected;

(C) the long-term technical and competitive viability of the batteries to be used in the project and of the original manufacturer of such batteries;

(D) the suitability of the batteries for their intended uses;

(E) the technical performance of the batteries, including the expected additional useful life and the batteries’ ability to retain energy;

(F) the environmental effects of the use of and disposal of the batteries proposed to be used in the project selected;

(G) the extent of involvement of State or local government and other persons in the demonstration project and whether such involvement will—

(i) permit a reduction of the Federal cost share per project; or

(ii) otherwise be used to allow the Federal contribution to be provided to demonstrate a greater number of batteries; and

(H) such other criteria as the Secretary considers appropriate.

(3) CONDITIONS.—The Secretary shall require that—

(A) as a part of a demonstration project, the users of the batteries provide to the proposer information regarding the operation, maintenance, performance, and use of the batteries, and the proposer provide such information to the battery manufacturer, for 3 years after the beginning of the demonstration project;

(B) the proposer provide to the Secretary such information regarding the operation, maintenance, performance, and use of the batteries as the Secretary may request;

(C) the proposer provide to the Secretary such information regarding the disposal of the batteries as the Secretary may require to ensure that the proposer disposes of the batteries in accordance with applicable law; and

(D) the proposer provide at least 50 percent of the costs associated with the proposal.

## **PART 5—ENERGY EFFICIENCY SCIENCE INITIATIVE**

### **SEC. 110. ENERGY EFFICIENCY SCIENCE INITIATIVE.**

(a) **ESTABLISHMENT.**—The Secretary shall establish an Energy Efficiency Science Initiative to be managed by the Assistant Secretary in the Department with responsibility for energy conservation under section 203(a)(9) of the Department of Energy Organization Act (42 U.S.C. 7133(a)(9)), in consultation with the Director of the Office of Science, for grants to be competitively awarded and subject to peer review for research relating to energy efficiency.

(b) **REPORT.**—The Secretary shall submit to the Congress, along with the President’s annual budget request under section 1105(a) of title 31, United States Code, a report on the activities of the Energy Efficiency Science Initiative, including a description of the process used to award the funds and an explanation of how the research relates to energy efficiency.

## **PART 6—ADVANCED ENERGY TECHNOLOGY TRANSFER CENTERS**

### **SEC. 110A. ADVANCED ENERGY TECHNOLOGY TRANSFER CENTERS.**

(a) **GRANTS.**—Not later than 18 months after the date of the enactment of this Act, the Secretary shall make grants to nonprofit institutions, State and local governments, or universities (or consortia thereof), to establish a nationwide network of at least 10 Advanced Energy Technology Transfer Centers, to be located in areas the Secretary determines have the greatest need of the services of such Centers.

(b) **ACTIVITIES.**—(1) Each Center shall operate a program to encourage demonstration and commercial application of advanced energy methods and technologies through education and outreach to building and industrial professionals, and to other individuals and organizations with an interest in efficient energy use.

(2) Each Center shall establish an advisory panel to advise the Center on how best to accomplish the activities under paragraph (1).

(c) **APPLICATION.**—A person seeking a grant under this section shall submit to the Secretary an application in such form and containing such information as the Secretary may require. The Secretary may award a grant under this section to an entity already in existence if the entity is otherwise eligible under this section.

(d) **SELECTION CRITERIA.**—The Secretary shall award grants under this section on the basis of the following criteria, at a minimum:

(1) The ability of the applicant to carry out the activities in subsection (b).

(2) The extent to which the applicant will coordinate the activities of the Center with other entities, such as State and local governments, utilities, and educational and research institutions.

(e) **MATCHING FUNDS.**—The Secretary shall require a non-Federal matching requirement of at least 50 percent of the costs of establishing and operating each Center.

(f) **ADVISORY COMMITTEE.**—The Secretary shall establish an advisory committee to advise the Secretary on the establishment of Centers under this section. The advisory committee shall be composed of individuals with expertise in the area of advanced energy methods and technologies, including at least 1 representative from—

(1) State or local energy offices;

(2) energy professionals;

(3) trade or professional associations;

(4) architects, engineers, or construction professionals;

(5) manufacturers;

(6) the research community; and

(7) nonprofit energy or environmental organizations.

(g) **DEFINITIONS.**—For purposes of this section—

(1) the term “advanced energy methods and technologies” means all methods and technologies that promote energy efficiency and conservation, including distributed generation technologies, and life-cycle analysis of energy use;

(2) the term “Center” means an Advanced Energy Technology Transfer Center established pursuant to this section; and

(3) the term “distributed generation” means an electric power generation facility that is designed to serve retail electric consumers at or near the facility site.

## **Subtitle B—Distributed Energy and Electric Energy Systems**

### **PART 1—AUTHORIZATION OF APPROPRIATIONS**

#### **SEC. 111. DISTRIBUTED ENERGY AND ELECTRIC ENERGY SYSTEMS.**

(a) **IN GENERAL.**—The following sums are authorized to be appropriated to the Secretary for distributed energy and electric energy systems activities, including activities authorized under this subtitle:

- (1) For fiscal year 2004, \$190,000,000.
- (2) For fiscal year 2005, \$200,000,000.
- (3) For fiscal year 2006, \$220,000,000.
- (4) For fiscal year 2007, \$240,000,000.

(b) **MICRO-COGENERATION ENERGY TECHNOLOGY.**—From amounts authorized under subsection (a), the following sums shall be available for activities under section 114:

- (1) For fiscal year 2004, \$5,000,000.
- (2) For fiscal year 2005, \$5,500,000.
- (3) For fiscal year 2006, \$6,000,000.
- (4) For fiscal year 2007, \$6,500,000.

#### **SEC. 111A. DEMONSTRATION AND FIELD TEST.**

The Secretary shall conduct a demonstration and field test of distributed generation systems. Such test shall be conducted in both geographically concentrated and dispersed regions and shall define the full range of communications and control system needs in distributed generation systems. This test should be used to identify future research priorities and the scale-up challenges necessary to meet the Department’s goals for distributed energy over the next 10 years.

### **PART 2—DISTRIBUTED POWER**

#### **SEC. 112. STRATEGY.**

(a) **REQUIREMENT.**—Not later than 1 year after the date of enactment of this Act, the Secretary shall develop and transmit to the Congress a strategy for a comprehensive research, development, demonstration, and commercial application program to develop hybrid distributed power systems that combine—

- (1) one or more renewable electric power generation technologies of 10 megawatts or less located near the site of electric energy use; and
- (2) nonintermittent electric power generation technologies suitable for use in a distributed power system.

(b) **CONTENTS.**—The strategy shall—

- (1) identify the needs best met with such hybrid distributed power systems and the technological barriers to the use of such systems;
- (2) provide for the development of methods to design, test, integrate into systems, and operate such hybrid distributed power systems;
- (3) include, as appropriate, research, development, demonstration, and commercial application on related technologies needed for the adoption of such hybrid distributed power systems, including energy storage devices and environmental control technologies;
- (4) include research, development, demonstration, and commercial application of interconnection technologies for communications and controls of distributed generation architectures, particularly technologies promoting real-time response to power market information and physical conditions on the electrical grid; and
- (5) describe how activities under the strategy will be integrated with other research, development, demonstration, and commercial application activities supported by the Department of Energy related to electric power technologies.

#### **SEC. 113. HIGH POWER DENSITY INDUSTRY PROGRAM.**

The Secretary shall establish a comprehensive research, development, demonstration, and commercial application program to improve energy efficiency of high power density facilities, including data centers, server farms, and telecommunications facilities. Such program shall consider technologies that provide significant improve-

ment in thermal controls, metering, load management, peak load reduction, or the efficient cooling of electronics.

**SEC. 114. MICRO-COGENERATION ENERGY TECHNOLOGY.**

The Secretary shall make competitive, merit-based grants to consortia for the development of micro-cogeneration energy technology. The consortia shall explore the use of small-scale combined heat and power in residential heating appliances.

**PART 3—TRANSMISSION SYSTEMS**

**SEC. 115. TRANSMISSION INFRASTRUCTURE SYSTEMS RESEARCH, DEVELOPMENT, DEMONSTRATION, AND COMMERCIAL APPLICATION.**

(a) PROGRAM AUTHORIZED.—The Secretary shall develop and implement a comprehensive research, development, demonstration, and commercial application program to promote improved reliability and efficiency of electrical transmission systems. Such program may include—

- (1) advanced energy technologies, materials, and systems;
- (2) advanced grid reliability and efficiency technology development;
- (3) technologies contributing to significant load reductions;
- (4) advanced metering, load management, and control technologies;
- (5) technologies to enhance existing grid components;
- (6) the development and use of high-temperature superconductors to—
  - (A) enhance the reliability, operational flexibility, or power-carrying capability of electric transmission or distribution systems; or
  - (B) increase the efficiency of electric energy generation, transmission, distribution, or storage systems;
- (7) integration of power systems, including systems to deliver high-quality electric power, electric power reliability, and combined heat and power;
- (8) any other infrastructure technologies, as appropriate; and
- (9) technology transfer and education.

(b) PROGRAM PLAN.—Not later than 1 year after the date of the enactment of this Act, the Secretary, in consultation with other appropriate Federal agencies, shall prepare and transmit to Congress a 5-year program plan to guide activities under this section. In preparing the program plan, the Secretary shall consult with utilities, energy services providers, manufacturers, institutions of higher education, other appropriate State and local agencies, environmental organizations, professional and technical societies, and any other persons the Secretary considers appropriate.

(c) REPORT.—Not later than 2 years after the transmittal of the plan under subsection (b), the Secretary shall transmit a report to Congress describing the progress made under this section and identifying any additional resources needed to continue the development and commercial application of transmission infrastructure technologies.

**PART 4—GENERAL PROVISIONS**

**SEC. 116. DEFINITIONS.**

For purposes of this subtitle—

- (1) the term “hybrid distributed power system” means a system using 2 or more distributed power sources, operated together with associated supporting equipment, including storage equipment, and software necessary to provide electric power onsite and to an electric distribution system; and
- (2) the term “distributed power source” means an independent electric energy source of usually 10 megawatts or less located close to a residential, commercial, or industrial load center, including—
  - (A) reciprocating engines;
  - (B) turbines;
  - (C) microturbines;
  - (D) fuel cells;
  - (E) solar electric systems;
  - (F) wind energy systems;
  - (G) biopower systems;
  - (H) geothermal power systems; or
  - (I) combined heat and power systems.

**SEC. 117. VOLUNTARY CONSENSUS STANDARDS.**

In a manner consistent with the National Technology Transfer Advancement Act, the Secretary, in consultation with the National Institute of Standards and Tech-

nology, shall work with the Institute of Electrical and Electronic Engineers and other standards development organizations to take all appropriate steps toward the development, promulgation, and implementation of voluntary consensus standards for distributed energy systems for use in manufacturing and using equipment and systems for connection with electric distribution systems, for obtaining electricity from, or providing electricity to, such systems.

## **Subtitle C—Renewable Energy**

### **PART 1—AUTHORIZATION OF APPROPRIATIONS**

#### **SEC. 121. RENEWABLE ENERGY.**

(a) **IN GENERAL.**—The following sums are authorized to be appropriated to the Secretary for renewable energy research, development, demonstration, and commercial application activities, including activities authorized under this subtitle:

- (1) For fiscal year 2004, \$380,000,000.
- (2) For fiscal year 2005, \$420,000,000.
- (3) For fiscal year 2006, \$460,000,000.
- (4) For fiscal year 2007, \$499,000,000.

(b) **BIOENERGY.**—From the amounts authorized under subsection (a), the following sums are authorized to be appropriated to carry out section 122 and section 176:

- (1) For fiscal year 2004, \$135,425,000.
- (2) For fiscal year 2005, \$155,600,000.
- (3) For fiscal year 2006, \$167,650,000.
- (4) For fiscal year 2007, \$180,000,000.

(c) **PUBLIC BUILDINGS.**—From the amounts authorized under subsection (a), \$30,000,000 for each of the fiscal years 2004 through 2007 are authorized to be appropriated to carry out section 127.

(d) **LIMITS ON USE OF FUNDS.**—

(1) **EXCLUSION.**—None of the funds authorized to be appropriated under this section may be used for Renewable Support and Implementation.

(2) **BIOENERGY.**—Of the funds authorized under subsection (b), not less than \$5,000,000 for each fiscal year shall be made available for grants to Historically Black Colleges and Universities, Tribal Colleges, and Hispanic-Serving Institutions.

(3) **RURAL AND REMOTE LOCATIONS.**—In carrying out this section, the Secretary, in consultation with the Secretary of Agriculture, shall demonstrate the use of advanced wind power technology, biomass, geothermal energy systems, and other renewable energy technologies to assist in delivering electricity to rural and remote locations.

(4) **REGIONAL FIELD VERIFICATION.**—Of the funds authorized under subsection (a), not less than \$4,000,000 for each fiscal year shall be made available for the Regional Field Verification Program of the Department.

### **PART 2—BIOENERGY**

#### **SEC. 122. BIOENERGY PROGRAMS.**

The Secretary shall conduct a program of research, development, demonstration, and commercial application for bioenergy, including—

- (1) biopower energy systems;
- (2) biofuels;
- (3) integrated applications of both biopower and biofuels;
- (4) cross-cutting research and development in feedstocks; and
- (5) economic analysis.

### **PART 3—MISCELLANEOUS PROJECTS**

#### **SEC. 126. MISCELLANEOUS PROJECTS.**

(a) **PROGRAMS.**—The Secretary shall conduct research, development, demonstration, and commercial application programs for—

- (1) ocean energy, including wave energy;
- (2) the combined use of renewable energy technologies with one another and with other energy technologies, including the combined use of wind power and coal gasification technologies; and
- (3) hydrogen carrier fuels.

(b) STUDY.—(1) The Secretary shall enter into an arrangement with the National Academy of Sciences to conduct a study on—

(A) the feasibility of various methods of renewable generation of energy from the ocean, including energy from waves, tides, currents, and thermal gradients; and

(B) the research, development, demonstration, and commercial application activities required to make marine renewable energy generation competitive with other forms of electricity generation.

(2) Not later than 1 year after the date of the enactment of this Act, the Secretary shall transmit the study to the Congress along with the Secretary's recommendations for implementing the results of the study.

**SEC. 127. RENEWABLE ENERGY IN PUBLIC BUILDINGS.**

(a) DEMONSTRATION AND TECHNOLOGY TRANSFER PROGRAM.—The Secretary shall establish a program for the demonstration of innovative technologies for solar and other renewable energy sources in buildings owned or operated by a State or local government, and for the dissemination of information resulting from such demonstration to interested parties.

(b) LIMIT ON FEDERAL FUNDING.—The Secretary shall provide under this section no more than 40 percent of the incremental costs of the solar or other renewable energy source project funded.

(c) REQUIREMENT.—As part of the application for awards under this section, the Secretary shall require all applicants—

(1) to demonstrate a continuing commitment to the use of solar and other renewable energy sources in buildings they own or operate; and

(2) to state how they expect any award to further their transition to the significant use of renewable energy.

## **Subtitle D—Nuclear Energy**

### **PART 1—AUTHORIZATION OF APPROPRIATIONS**

**SEC. 131. NUCLEAR ENERGY.**

(a) IN GENERAL.—The following sums are authorized to be appropriated to the Secretary for nuclear energy research, development, demonstration, and commercial application activities, including activities authorized under this subtitle:

(1) For fiscal year 2004, \$388,000,000.

(2) For fiscal year 2005, \$416,000,000.

(3) For fiscal year 2006, \$445,000,000.

(4) For fiscal year 2007, \$474,000,000.

(b) ALLOCATIONS.—From amounts authorized under subsection (a), the following sums are authorized:

(1) NUCLEAR INFRASTRUCTURE SUPPORT.—For activities under section 132(f)—  
 (A) for fiscal year 2004, \$125,000,000;  
 (B) for fiscal year 2005, \$130,000,000;  
 (C) for fiscal year 2006, \$135,000,000; and  
 (D) for fiscal year 2007, \$140,000,000.

(2) ADVANCED FUEL RECYCLING PROGRAM.—For activities under section 133—  
 (A) for fiscal year 2004, \$80,000,000;  
 (B) for fiscal year 2005, \$93,000,000;  
 (C) for fiscal year 2006, \$106,000,000; and  
 (D) for fiscal year 2007, \$120,000,000.

(3) UNIVERSITY PROGRAMS.—For activities under section 134—

(A) for fiscal year 2004, \$35,200,000, of which—  
 (i) \$3,000,000 shall be for activities under subsection (b)(1) of that section;

(ii) \$4,275,000 shall be for activities under subsection (b)(2) of that section;

(iii) \$8,000,000 shall be for activities under subsection (b)(3) of that section;

(iv) \$500,000 shall be for activities under subsection (b)(5) of that section;

(v) \$7,000,000 shall be for activities under subsection (c)(1) of that section;

(vi) \$700,000 shall be for activities under subsection (c)(2) of that section;

(vii) \$10,000,000 shall be for activities under subsection (c)(3) of that section;

- (viii) \$1,000,000 shall be for activities under subsection (d)(1) of that section; and
  - (ix) \$725,000 shall be for activities under subsection (d)(2) of that section;
  - (B) for fiscal year 2005, \$44,350,000, of which—
    - (i) \$3,100,000 shall be for activities under subsection (b)(1) of that section;
    - (ii) \$6,275,000 shall be for activities under subsection (b)(2) of that section;
    - (iii) \$12,000,000 shall be for activities under subsection (b)(3) of that section;
    - (iv) \$550,000 shall be for activities under subsection (b)(5) of that section;
    - (v) \$7,500,000 shall be for activities under subsection (c)(1) of that section;
    - (vi) \$1,100,000 shall be for activities under subsection (c)(2) of that section;
    - (vii) \$12,000,000 shall be for activities under subsection (c)(3) of that section;
    - (viii) \$1,100,000 shall be for activities under subsection (d)(1) of that section; and
    - (ix) \$725,000 shall be for activities under subsection (d)(2) of that section;
  - (C) for fiscal year 2006, \$49,200,000, of which—
    - (i) \$3,200,000 shall be for activities under subsection (b)(1) of that section;
    - (ii) \$7,150,000 shall be for activities under subsection (b)(2) of that section;
    - (iii) \$13,000,000 shall be for activities under subsection (b)(3) of that section;
    - (iv) \$600,000 shall be for activities under subsection (b)(5) of that section;
    - (v) \$8,000,000 shall be for activities under subsection (c)(1) of that section;
    - (vi) \$1,200,000 shall be for activities under subsection (c)(2) of that section;
    - (vii) \$14,000,000 shall be for activities under subsection (c)(3) of that section;
    - (viii) \$1,200,000 shall be for activities under subsection (d)(1) of that section; and
    - (ix) \$850,000 shall be for activities under subsection (d)(2) of that section; and
  - (D) for fiscal year 2007, \$54,950,000, of which—
    - (i) \$3,200,000 shall be for activities under subsection (b)(1) of that section;
    - (ii) \$8,150,000 shall be for activities under subsection (b)(2) of that section;
    - (iii) \$15,000,000 shall be for activities under subsection (b)(3) of that section;
    - (iv) \$650,000 shall be for activities under subsection (b)(5) of that section;
    - (v) \$8,500,000 shall be for activities under subsection (c)(1); of that section;
    - (vi) \$1,300,000 shall be for activities under subsection (c)(2) of that section;
    - (vii) \$16,000,000 shall be for activities under subsection (c)(3) of that section;
    - (viii) \$1,300,000 shall be for activities under subsection (d)(1) of that section; and
    - (ix) \$850,000 shall be for activities under subsection (d)(2) of that section.
  - (4) GEOLOGICAL ISOLATION OF SPENT FUEL.—For activities under section 135—
    - (A) for fiscal year 2004, \$7,000,000;
    - (B) for fiscal year 2005, \$8,000,000;
    - (C) for fiscal year 2006, \$9,000,000; and
    - (D) for fiscal year 2007, \$10,000,000.
- (c) LIMIT ON USE OF FUNDS.—None of the funds authorized under this section may be used for decommissioning the Fast Flux Test Facility.

## **PART 2—NUCLEAR ENERGY RESEARCH PROGRAMS**

### **SEC. 132. NUCLEAR ENERGY RESEARCH PROGRAMS.**

(a) **NUCLEAR ENERGY RESEARCH INITIATIVE.**—The Secretary shall carry out a Nuclear Energy Research Initiative for research and development related to nuclear energy.

(b) **NUCLEAR ENERGY PLANT OPTIMIZATION PROGRAM.**—The Secretary shall carry out a Nuclear Energy Plant Optimization Program to support research and development activities addressing reliability, availability, productivity, and component aging in existing nuclear power plants.

(c) **NUCLEAR POWER 2010 PROGRAM.**—The Secretary shall carry out a Nuclear Power 2010 Program, consistent with recommendations in the October 2001 report entitled “A Roadmap to Deploy New Nuclear Power Plants in the United States by 2010” issued by the Nuclear Energy Research Advisory Committee of the Department. The Program shall—

- (1) rely on the expertise and capabilities of the National Laboratories in the areas of advanced nuclear fuels cycles and fuels testing;
- (2) pursue an approach that considers a variety of reactor designs;
- (3) include participation of international collaborators in research, development, and design efforts as appropriate; and
- (4) encourage industry participation.

(d) **GENERATION IV NUCLEAR ENERGY SYSTEMS INITIATIVE.**—The Secretary shall carry out a Generation IV Nuclear Energy Systems Initiative to develop an overall technology plan and to support research and development necessary to make an informed technical decision about the most promising candidates for eventual commercial application. The Initiative shall examine advanced proliferation-resistant and passively safe reactor designs, including designs that—

- (1) are economically competitive with other electric power generation plants;
- (2) have higher efficiency, lower cost, and improved safety compared to reactors in operation on the date of enactment of this Act;
- (3) use fuels that are proliferation resistant and have substantially reduced production of high-level waste per unit of output; and
- (4) utilize improved instrumentation.

(e) **NUCLEAR PRODUCTION OF HYDROGEN.**—Pursuant to the Spark M. Matsunaga Hydrogen Research, Development, and Demonstration Act of 1990, as amended by subtitle H of this Act, the Secretary shall carry out a program of research, development, demonstration, and commercial application on various approaches to nuclear production of hydrogen.

(f) **NUCLEAR INFRASTRUCTURE SUPPORT.**—The Secretary shall develop and implement a strategy for the facilities of the Office of Nuclear Energy, Science, and Technology and shall transmit a report containing the strategy along with the President’s budget request to the Congress for fiscal year 2005. Such strategy shall provide a cost-effective means for—

- (1) maintaining existing facilities and infrastructure, as needed;
- (2) closing unneeded facilities;
- (3) making facility upgrades and modifications; and
- (4) building new facilities.

## **PART 3—ADVANCED FUEL RECYCLING**

### **SEC. 133. ADVANCED FUEL RECYCLING PROGRAM.**

(a) **IN GENERAL.**—The Secretary, through the Director of the Office of Nuclear Energy, Science and Technology, shall conduct an advanced fuel recycling technology research and development program to evaluate proliferation-resistant fuel recycling and transmutation technologies which minimize environmental or public health and safety impacts as an alternative to aqueous reprocessing technologies deployed as of the date of enactment of this Act in support of evaluation of alternative national strategies for spent nuclear fuel and the Generation IV advanced reactor concepts, subject to annual review by the Secretary’s Nuclear Energy Research Advisory Committee or other independent entity, as appropriate. Opportunities to enhance progress of this program through international cooperation should be sought.

(b) **REPORTS.**—The Secretary shall report on the activities of the advanced fuel recycling technology research and development program, as part of the Department’s annual budget submission.

## PART 4—UNIVERSITY PROGRAMS

### SEC. 134. UNIVERSITY NUCLEAR SCIENCE AND ENGINEERING SUPPORT.

(a) **ESTABLISHMENT.**—The Secretary shall support a program to invest in human resources and infrastructure in the nuclear sciences and engineering and related fields (including health physics and nuclear and radiochemistry), consistent with departmental missions related to civilian nuclear research and development.

(b) **DUTIES.**—In carrying out the program under this section, the Secretary shall—

(1) establish a graduate and undergraduate fellowship program to attract new and talented students;

(2) establish a Junior Faculty Research Initiation Grant Program to assist institutions of higher education in recruiting and retaining new faculty in the nuclear sciences and engineering;

(3) support fundamental nuclear sciences and engineering research through the Nuclear Engineering Education Research Program;

(4) encourage collaborative nuclear research among industry, National Laboratories, and institutions of higher education through the Nuclear Energy Research Initiative; and

(5) support communication and outreach related to nuclear science and engineering.

(c) **STRENGTHENING UNIVERSITY RESEARCH AND TRAINING REACTORS AND ASSOCIATED INFRASTRUCTURE.**—Activities under this section may include—

(1) converting research reactors currently using high-enrichment fuels to low-enrichment fuels, upgrading operational instrumentation, and sharing of reactors among institutions of higher education;

(2) providing technical assistance, in collaboration with the United States nuclear industry, in relicensing and upgrading training reactors as part of a student training program; and

(3) providing funding, through the Innovations in Nuclear Infrastructure and Education Program, for reactor improvements as part of a focused effort that emphasizes research, training, and education.

(d) **UNIVERSITY-NATIONAL LABORATORY INTERACTIONS.**—The Secretary shall develop—

(1) a sabbatical fellowship program for professors at institutions of higher education to spend extended periods of time at National Laboratories in the areas of nuclear science and technology; and

(2) a visiting scientist program in which National Laboratory staff can spend time in academic nuclear science and engineering departments.

The Secretary may provide fellowships for students to spend time at National Laboratories in the area of nuclear science with a member of the Laboratory staff acting as a mentor.

(e) **OPERATING AND MAINTENANCE COSTS.**—Funding for a research project provided under this section may be used to offset a portion of the operating and maintenance costs of a research reactor at an institution of higher education used in the research project.

## PART 5—GEOLOGICAL ISOLATION OF SPENT FUEL

### SEC. 135. GEOLOGICAL ISOLATION OF SPENT FUEL.

(a) **IN GENERAL.**—The Secretary shall establish a program to determine the feasibility of deep borehole disposal of spent nuclear fuel and high-level radioactive waste. The program shall emphasize geological, chemical, and hydrological characterization of, and design of engineered structures for, deep borehole environments.

(b) **PLAN.**—Not later than 6 months after the date of enactment of this Act, the Secretary shall transmit to the Congress a plan for the program under this section, including milestones for achieving the purpose of the program.

(c) **FINAL REPORT.**—Not later than 5 years after the date of enactment of this Act, the Secretary shall transmit to the Congress a final report on the findings of the program under this section.

## Subtitle E—Fossil Energy

### PART 1—AUTHORIZATION OF APPROPRIATIONS

#### SEC. 141. FOSSIL ENERGY.

(a) **IN GENERAL.**—The following sums are authorized to be appropriated to the Secretary for fossil energy research, development, demonstration, and commercial application activities, other than those described in subsection (b), including activities authorized under this subtitle but not including activities authorized under title V:

- (1) For fiscal year 2004, \$530,000,000.
- (2) For fiscal year 2005, \$556,000,000.
- (3) For fiscal year 2006, \$583,000,000.
- (4) For fiscal year 2007, \$611,000,000.

No less than 60 percent of the amount appropriated for each fiscal year under this subsection shall be available for activities related to the coal research program under section 142(a).

#### (b) ULTRA-DEEPWATER AND UNCONVENTIONAL RESOURCES.—

(1) **OIL AND GAS LEASE INCOME.**—For each of fiscal years 2004 through 2010, from any royalties, rents, and bonuses derived from Federal onshore and offshore oil and gas leases issued under the Outer Continental Shelf Lands Act and the Mineral Leasing Act which are deposited in the Treasury, and after distribution of any such funds as described in paragraph (2), an amount equal to 7.5 percent of the amount of royalties, rents, and bonuses derived from those leases deposited in the Treasury shall be deposited into the Ultra-Deepwater and Unconventional Natural Gas and Other Petroleum Research Fund (in this subsection referred to as the Fund). For purposes of this subsection, the term “royalties” excludes proceeds from the sale of royalty production taken in kind and royalty production that is transferred under section 27(a)(3) of the Outer Continental Shelf Lands Act (43 U.S.C. 1353(a)(3)). Monies in the Fund shall be available to the Secretary for obligation under part 3, without fiscal year limitation, to the extent provided in advance in appropriations Acts.

(2) **PRIOR DISTRIBUTIONS.**—The distributions described in paragraph (1) are those required by law—

(A) to States and to the Reclamation Fund under the Mineral Leasing Act (30 U.S.C. 191(a)); and

(B) to other funds receiving monies from Federal oil and gas leasing programs, including—

(i) any recipients pursuant to section 8(g) of the Outer Continental Shelf Lands Act (43 U.S.C. 1337(g));

(ii) the Land and Water Conservation Fund, pursuant to section 2(c) of the Land and Water Conservation Fund Act of 1965 (16 U.S.C. 4601–5(c)); and

(iii) the Historic Preservation Fund, pursuant to section 108 of the National Historic Preservation Act (16 U.S.C. 470h).

(3) **ALLOCATION.**—Amounts made available under this subsection in each fiscal year shall be allocated as follows:

(A) 67.5 percent shall be for ultra-deepwater natural gas and other petroleum activities under section 145;

(B) 22.5 percent shall be for unconventional natural gas and other petroleum resource activities under section 146; and

(C) 10 percent shall be for research complementary to research under section 144(b)(1) through (3).

(c) **ALLOCATIONS.**—From amounts authorized under subsection (a), the following sums are authorized:

(1) **FUEL CELL PROTON EXCHANGE MEMBRANE TECHNOLOGY.**—For activities under section 142(c)(2), \$28,000,000 for each of the fiscal years 2004 through 2007.

(2) **COAL MINING TECHNOLOGIES.**—For activities under section 143—

(A) for fiscal year 2004, \$12,000,000; and

(B) for fiscal year 2005, \$15,000,000.

(3) **OFFICE OF ARCTIC ENERGY.**—For the Office of Arctic Energy under section 3197 of the Floyd D. Spence National Defense Authorization Act for Fiscal Year 2001 (Public Law 106–398), \$25,000,000 for each of fiscal years 2004 through 2007.

(d) **EXTENDED AUTHORIZATION.**—There are authorized to be appropriated to the Secretary for the Office of Arctic Energy under section 3197 of the Floyd D. Spence

National Defense Authorization Act for Fiscal Year 2001 (Public Law 106–398), \$25,000,000 for each of fiscal years 2008 through 2011.

(e) LIMITS ON USE OF FUNDS.—

(1) EXCLUSIONS.—None of the funds authorized under this section may be used for—

- (A) Fossil Energy Environmental Restoration; or
- (B) Import/Export Authorization.

(2) UNIVERSITY COAL MINING RESEARCH.—Of the funds authorized under subsection (c)(2), not less than 20 percent of the funds appropriated for each fiscal year shall be dedicated to research and development carried out at institutions of higher education.

## PART 2—RESEARCH PROGRAMS

### SEC. 142. FOSSIL ENERGY RESEARCH PROGRAMS.

(a) COAL RESEARCH.—(1) In addition to the Clean Coal Power Initiative authorized under title V, the Secretary shall conduct a program of research, development, demonstration, and commercial application for coal and power systems, including—

- (A) central systems;
- (B) sequestration research and development;
- (C) fuels;
- (D) advanced research; and
- (E) advanced separation technologies.

(2) Not later than 6 months after the date of enactment of this Act, the Secretary shall transmit to the Congress a report providing—

- (A) a detailed description of how proposals will be solicited and evaluated;
- (B) a list of activities and technical milestones; and
- (C) a description of how these activities will complement and not duplicate the Clean Coal Power Initiative authorized under title V.

(b) OIL AND GAS RESEARCH.—The Secretary shall conduct a program of research, development, demonstration, and commercial application on oil and gas, including—

- (1) exploration and production;
- (2) gas hydrates;
- (3) reservoir life and extension;
- (4) transportation and distribution infrastructure;
- (5) ultraclean fuels;
- (6) heavy oil and oil shale; and
- (7) environmental research.

(c) FUEL CELLS.—(1) In coordination with the programs described in the Spark M. Matsunaga Hydrogen Research, Development, and Demonstration Act of 1990, as amended by subtitle H of this Act, the Secretary shall conduct a program of research, development, demonstration, and commercial application on fuel cells for low-cost, high-efficiency, fuel-flexible, modular power systems.

(2) The demonstrations shall include fuel cell proton exchange membrane technology for commercial, residential, and transportation applications, and distributed generation systems, utilizing improved manufacturing production and processes.

(d) NATURAL GAS AND OIL DEPOSITS REPORT.—Not later than 2 years after the date of the enactment of this Act, and at 2-year intervals thereafter, the Secretary of the Interior, in consultation with other appropriate Federal agencies, shall transmit a report to the Congress of the latest estimates of natural gas and oil reserves, reserves growth, and undiscovered resources in Federal and State waters off the coast of Louisiana and Texas.

(e) TECHNOLOGY TRANSFER.—To the maximum extent practicable, existing technology transfer mechanisms shall be used to implement oil and gas exploration and production technology transfer programs.

### SEC. 143. RESEARCH AND DEVELOPMENT FOR COAL MINING TECHNOLOGIES.

(a) ESTABLISHMENT.—The Secretary shall carry out a program of research and development on coal mining technologies. The Secretary shall cooperate with appropriate Federal agencies, coal producers, trade associations, equipment manufacturers, institutions of higher education with mining engineering departments, and other relevant entities.

(b) PROGRAM.—The research and development activities carried out under this section shall—

- (1) be based on the mining research and development priorities identified by the Mining Industry of the Future Program and in the recommendations from relevant reports of the National Academy of Sciences on mining technologies; and

- (2) expand mining research capabilities at institutions of higher education.

### **PART 3—ULTRA-DEEPWATER AND UNCONVENTIONAL NATURAL GAS AND OTHER PETROLEUM RESOURCES**

#### **SEC. 144. PROGRAM AUTHORITY.**

(a) **IN GENERAL.**—The Secretary shall carry out a program under this part of research, development, demonstration, and commercial application of technologies for ultra-deepwater and unconventional natural gas and other petroleum resource exploration and production, including safe operations and environmental mitigation (including reduction of greenhouse gas emissions and sequestration of carbon).

(b) **PROGRAM ELEMENTS.**—The program under this part shall address the following areas, including improving safety and minimizing environmental impacts of activities within each area:

- (1) Ultra-deepwater technology.
- (2) Ultra-deepwater architecture.
- (3) Unconventional natural gas and other petroleum resource exploration and production technology.

(c) **LIMITATION ON LOCATION OF FIELD ACTIVITIES.**—Field activities under the program under this part shall be carried out only—

- (1) in—
  - (A) areas in the territorial waters of the United States not under any Outer Continental Shelf moratorium as of September 30, 2002;
  - (B) areas onshore in the United States on public land administered by the Secretary of the Interior available for oil and gas leasing, where consistent with applicable law and land use plans; and
  - (C) areas onshore in the United States on State or private land, subject to applicable law; and
- (2) with the approval of the appropriate Federal or State land management agency or private land owner.

(d) **RESEARCH AT NATIONAL ENERGY TECHNOLOGY LABORATORY.**—The Secretary, through the National Energy Technology Laboratory, shall carry out research complementary to research under subsection (b).

(e) **CONSULTATION WITH SECRETARY OF THE INTERIOR.**—In carrying out this part, the Secretary shall consult regularly with the Secretary of the Interior.

#### **SEC. 145. ULTRA-DEEPWATER PROGRAM.**

(a) **IN GENERAL.**—The Secretary shall carry out the activities under paragraphs (1) and (2) of section 144(b), to maximize the value of the ultra-deepwater natural gas and other petroleum resources of the United States by increasing the supply of such resources and by reducing the cost and increasing the efficiency of exploration for and production of such resources, while improving safety and minimizing environmental impacts.

(b) **ROLE OF THE SECRETARY.**—The Secretary shall have ultimate responsibility for, and oversight of, all aspects of the program under this section.

(c) **ROLE OF THE PROGRAM CONSORTIUM.**—

- (1) **IN GENERAL.**—The Secretary shall contract with a consortium to—
  - (A) manage awards pursuant to subsection (f)(4);
  - (B) make recommendations to the Secretary for project solicitations;
  - (C) disburse funds awarded under subsection (f) as directed by the Secretary in accordance with the annual plan under subsection (e); and
  - (D) carry out other activities assigned to the program consortium by this section.

(2) **LIMITATION.**—The Secretary may not assign any activities to the program consortium except as specifically authorized under this section.

- (3) **CONFLICT OF INTEREST.**—(A) The Secretary shall establish procedures—
  - (i) to ensure that each board member, officer, or employee of the program consortium who is in a decisionmaking capacity under subsection (f)(3) or (4) shall disclose to the Secretary any financial interests in, or financial relationships with, applicants for or recipients of awards under this section, including those of his or her spouse or minor child, unless such relationships or interests would be considered to be remote or inconsequential; and
  - (ii) to require any board member, officer, or employee with a financial relationship or interest disclosed under clause (i) to recuse himself or herself from any review under subsection (f)(3) or oversight under subsection (f)(4) with respect to such applicant or recipient.

- (B) The Secretary may disqualify an application or revoke an award under this section if a board member, officer, or employee has failed to comply with procedures required under subparagraph (A)(ii).
- (d) SELECTION OF THE PROGRAM CONSORTIUM.—
- (1) IN GENERAL.—The Secretary shall select the program consortium through an open, competitive process.
  - (2) MEMBERS.—The program consortium may include corporations, institutions of higher education, National Laboratories, or other research institutions. After submitting a proposal under paragraph (4), the program consortium may not add members without the consent of the Secretary.
  - (3) TAX STATUS.—The program consortium shall be an entity that is exempt from tax under section 501(c)(3) of the Internal Revenue Code of 1986.
  - (4) SCHEDULE.—Not later than 90 days after the date of enactment of this Act, the Secretary shall solicit proposals for the creation of the program consortium, which must be submitted not less than 180 days after the date of enactment of this Act. The Secretary shall select the program consortium not later than 240 days after such date of enactment.
  - (5) APPLICATION.—Applicants shall submit a proposal including such information as the Secretary may require. At a minimum, each proposal shall—
    - (A) list all members of the consortium;
    - (B) fully describe the structure of the consortium, including any provisions relating to intellectual property; and –
    - (C) describe how the applicant would carry out the activities of the program consortium under this section.
  - (6) ELIGIBILITY.—To be eligible to be selected as the program consortium, an applicant must be an entity whose members collectively have demonstrated capabilities in planning and managing research, development, demonstration, and commercial application programs in natural gas or other petroleum exploration or production.
  - (7) CRITERION.—The Secretary may consider the amount of the fee an applicant proposes to receive under subsection (g) in selecting a consortium under this section.
- (e) ANNUAL PLAN.—
- (1) IN GENERAL.—The program under this section shall be carried out pursuant to an annual plan prepared by the Secretary in accordance with paragraph (2).
  - (2) DEVELOPMENT.—(A) Before drafting an annual plan under this subsection, the Secretary shall solicit specific written recommendations from the program consortium for each element to be addressed in the plan, including those described in paragraph (4). The Secretary may request that the program consortium submit its recommendations in the form of a draft annual plan.  
(B) The Secretary shall submit the recommendations of the program consortium under subparagraph (A) to the Ultra-Deepwater Advisory Committee established under section 148(a) for review, and such Advisory Committee shall provide to the Secretary written comments by a date determined by the Secretary. The Secretary may also solicit comments from any other experts.  
(C) The Secretary shall consult regularly with the program consortium throughout the preparation of the annual plan.
  - (3) PUBLICATION.—The Secretary shall transmit to the Congress and publish in the Federal Register the annual plan, along with any written comments received under paragraph (2)(A) and (B). The annual plan shall be transmitted and published not later than 60 days after the date of enactment of an Act making appropriations for a fiscal year for the program under this section.
  - (4) CONTENTS.—The annual plan shall describe the ongoing and prospective activities of the program under this section and shall include—
    - (A) a list of any solicitations for awards that the Secretary plans to issue to carry out research, development, demonstration, or commercial application activities, including the topics for such work, who would be eligible to apply, selection criteria, and the duration of awards; and
    - (B) a description of the activities expected of the program consortium to carry out subsection (f)(4).
- (f) AWARDS.—
- (1) IN GENERAL.—The Secretary shall make awards to carry out research, development, demonstration, and commercial application activities under the program under this section. The program consortium shall not be eligible to receive such awards, but members of the program consortium may receive such awards.
  - (2) PROPOSALS.—The Secretary shall solicit proposals for awards under this subsection in such manner and at such time as the Secretary may prescribe, in consultation with the program consortium.

(3) **REVIEW.**—The Secretary shall make awards under this subsection through a competitive process, which shall include a review by individuals selected by the Secretary. Such individuals shall include, for each application, Federal officials, the program consortium, and non-Federal experts who are not board members, officers, or employees of the program consortium or of a member of the program consortium.

(4) **OVERSIGHT.**—(A) The program consortium shall oversee the implementation of awards under this subsection, consistent with the annual plan under subsection (e), including disbursing funds and monitoring activities carried out under such awards for compliance with the terms and conditions of the awards.

(B) Nothing in subparagraph (A) shall limit the authority or responsibility of the Secretary to oversee awards, or limit the authority of the Secretary to review or revoke awards.

(C) The Secretary shall provide to the program consortium the information necessary for the program consortium to carry out its responsibilities under this paragraph.

(g) **FEE.**—

(1) **IN GENERAL.**—To compensate the program consortium for carrying out its activities under this section, the Secretary shall provide to the program consortium a fee in an amount not to exceed 7.5 percent of the amounts awarded under subsection (f) for each fiscal year.

(2) **ADVANCE.**—The Secretary shall advance funds to the program consortium upon selection of the consortium, which shall be deducted from amounts to be provided under paragraph (1).

(h) **AUDIT.**—The Secretary shall retain an independent, commercial auditor to determine the extent to which funds provided to the program consortium, and funds provided under awards made under subsection (f), have been expended in a manner consistent with the purposes and requirements of this part. The auditor shall transmit a report annually to the Secretary, who shall transmit the report to Congress, along with a plan to remedy any deficiencies cited in the report.

**SEC. 146. UNCONVENTIONAL NATURAL GAS AND OTHER PETROLEUM RESOURCES PROGRAM.**

(a) **IN GENERAL.**—The Secretary shall carry out activities under section 144(b)(3), to maximize the value of the onshore unconventional natural gas and other petroleum resources of the United States by increasing the supply of such resources and by reducing the cost and increasing the efficiency of exploration for and production of such resources, while improving safety and minimizing environmental impacts.

(b) **AWARDS.**—

(1) **IN GENERAL.**—The Secretary shall carry out this section through awards made through an open, competitive process.

(2) **CONSORTIA.**—In carrying out paragraph (1), the Secretary shall give preference to making awards to consortia.

(c) **AUDIT.**—The Secretary shall retain an independent, commercial auditor to determine the extent to which funds provided under awards made under this section have been expended in a manner consistent with the purposes and requirements of this part. The auditor shall transmit a report annually to the Secretary, who shall transmit the report to Congress, along with a plan to remedy any deficiencies cited in the report.

(d) **FOCUS AREAS.**—Awards under this section may focus on areas including advanced coal-bed methane, deep drilling, natural gas production from tight sands, natural gas production from gas shales, innovative exploration and production techniques, enhanced recovery techniques, and environmental mitigation of unconventional natural gas and other petroleum resources exploration and production.

(e) **ACTIVITIES BY THE UNITED STATES GEOLOGICAL SURVEY.**—The Secretary of the Interior, through the United States Geological Survey, shall, where appropriate, carry out programs of long-term research to complement the programs under this section.

**SEC. 147. ADDITIONAL REQUIREMENTS FOR AWARDS.**

(a) **DEMONSTRATION PROJECTS.**—An application for an award under this part for a demonstration project shall describe with specificity the intended commercial use of the technology to be demonstrated.

(b) **FLEXIBILITY IN LOCATING DEMONSTRATION PROJECTS.**—Subject to the limitation in section 144(c), a demonstration project under this part relating to an ultra-deepwater technology or an ultra-deepwater architecture may be conducted in deepwater depths.

(c) **INTELLECTUAL PROPERTY AGREEMENTS.**—If an award under this part is made to a consortium (other than the program consortium), the consortium shall provide to the Secretary a signed contract agreed to by all members of the consortium de-

scribing the rights of each member to intellectual property used or developed under the award.

(d) **TECHNOLOGY TRANSFER.**—Each recipient of an award under this part shall conduct technology transfer activities, as appropriate, and outreach activities pursuant to section 192.

(e) **COST-SHARING REDUCTION FOR INDEPENDENT PRODUCERS.**—In applying the cost-sharing requirements under section 185 to an award under this part made solely to an independent producer of oil or gas, the Secretary may reduce the applicable non-Federal requirement in such section to a level not less than 10 percent of the cost of the project.

**SEC. 148. ADVISORY COMMITTEES.**

(a) **ULTRA-DEEPWATER ADVISORY COMMITTEE.**—

(1) **ESTABLISHMENT.**—Not later than 270 days after the date of enactment of this section, the Secretary shall establish an advisory committee to be known as the Ultra-Deepwater Advisory Committee.

(2) **MEMBERSHIP.**—The advisory committee under this subsection shall be composed of members appointed by the Secretary and including—

(A) individuals with extensive research experience or operational knowledge of offshore natural gas and other petroleum exploration and production;

(B) individuals broadly representative of the affected interests in ultra-deepwater natural gas and other petroleum production, including interests in environmental protection and safe operations;

(C) no individuals who are Federal employees; and

(D) no individuals who are board members, officers, or employees of the program consortium.

(3) **DUTIES.**—The advisory committee under this subsection shall—

(A) advise the Secretary on the development and implementation of programs under this part related to ultra-deepwater natural gas and other petroleum resources; and

(B) carry out section 145(e)(2)(B).

(4) **COMPENSATION.**—A member of the advisory committee under this subsection shall serve without compensation but shall receive travel expenses, including per diem in lieu of subsistence, in accordance with applicable provisions under subchapter I of chapter 57 of title 5, United States Code.

(b) **UNCONVENTIONAL RESOURCES TECHNOLOGY ADVISORY COMMITTEE.**—

(1) **ESTABLISHMENT.**—Not later than 270 days after the date of enactment of this section, the Secretary shall establish an advisory committee to be known as the Unconventional Resources Technology Advisory Committee.

(2) **MEMBERSHIP.**—The advisory committee under this subsection shall be composed of members appointed by the Secretary and including—

(A) individuals with extensive research experience or operational knowledge of unconventional natural gas and other petroleum resource exploration and production, including independent oil and gas producers;

(B) individuals broadly representative of the affected interests in unconventional natural gas and other petroleum resource exploration and production, including interests in environmental protection and safe operations; and

(C) no individuals who are Federal employees.

(3) **DUTIES.**—The advisory committee under this subsection shall advise the Secretary on the development and implementation of activities under this part related to unconventional natural gas and other petroleum resources.

(4) **COMPENSATION.**—A member of the advisory committee under this subsection shall serve without compensation but shall receive travel expenses, including per diem in lieu of subsistence, in accordance with applicable provisions under subchapter I of chapter 57 of title 5, United States Code.

(c) **PROHIBITION.**—No advisory committee established under this section shall make recommendations on funding awards to consortia or for specific projects.

**SEC. 149. LIMITS ON PARTICIPATION.**

(a) **IN GENERAL.**—An entity shall be eligible to receive an award under this part only if the Secretary finds—

(1) that the entity's participation in the program under this part would be in the economic interest of the United States; and

(2) that either—

(A) the entity is a United States-owned entity organized under the laws of the United States; or

(B) the entity is organized under the laws of the United States and has a parent entity organized under the laws of a country which affords—

- (i) to United States-owned entities opportunities, comparable to those afforded to any other entity, to participate in any cooperative research venture similar to those authorized under this part;
- (ii) to United States-owned entities local investment opportunities comparable to those afforded to any other entity; and
- (iii) adequate and effective protection for the intellectual property rights of United States-owned entities.

(b) **SENSE OF CONGRESS AND REPORT.**—It is the Sense of the Congress that ultra-deepwater technology developed under this part is to be developed primarily for production of ultra-deepwater natural gas and other petroleum resources of the United States, and that this priority is to be reflected in the terms of grants, contracts, and cooperative agreements entered under this part. As part of the annual Departmental budget submission, the Secretary shall report on all steps taken to implement the policy described in this subsection.

**SEC. 150. FUND.**

There is hereby established in the Treasury of the United States a separate fund to be known as the “Ultra-Deepwater and Unconventional Natural Gas and Other Petroleum Research Fund”.

**SEC. 150A. TRANSFER OF ADVANCED OIL AND GAS EXPLORATION AND PRODUCTION TECHNOLOGIES.**

(a) **ASSESSMENT.**—The Secretary shall review technology programs throughout the Federal Government to assess the suitability of technologies developed thereunder for use in ultradeep drilling research, development, demonstration, and commercial application.

(b) **TECHNOLOGY TRANSFER.**—Not later than 1 year after the date of enactment of this Act, the Secretary shall issue a solicitation seeking organizations knowledgeable of the technology needs of the ultradeep drilling industry. The Secretary shall select the most qualified applicant to manage a program to transfer technologies the Secretary determines suitable under subsection (a) to appropriate entities. The organization selected under section 145(d) shall not be eligible for selection under this subsection.

(c) **FUNDING.**—From the funds available under section 141(b)(3)(C), \$1,000,000 shall be available to carry out this section in each of the fiscal years 2004 through 2007.

**SEC. 151. SUNSET.**

The authority provided by this part shall terminate on September 30, 2010.

**SEC. 152. DEFINITIONS.**

In this part:

- (1) **DEEPWATER.**—The term “deepwater” means a water depth that is greater than 200 but less than 1,500 meters.
- (2) **PROGRAM CONSORTIUM.**—The term “program consortium” means the consortium selected under section 145(d).
- (3) **REMOTE OR INCONSEQUENTIAL.**—The term “remote or inconsequential” has the meaning given that term in regulations issued by the Office of Government Ethics under section 208(b)(2) of title 18, United States Code.
- (4) **ULTRA-DEEPWATER.**—The term “ultra-deepwater” means a water depth that is equal to or greater than 1,500 meters.
- (5) **ULTRA-DEEPWATER ARCHITECTURE.**—The term “ultra-deepwater architecture” means the integration of technologies for the exploration for, or production of, natural gas or other petroleum resources located at ultra-deepwater depths.
- (6) **ULTRA-DEEPWATER TECHNOLOGY.**—The term “ultra-deepwater technology” means a discrete technology that is specially suited to address one or more challenges associated with the exploration for, or production of, natural gas or other petroleum resources located at ultra-deepwater depths.
- (7) **UNCONVENTIONAL NATURAL GAS AND OTHER PETROLEUM RESOURCE.**—The term “unconventional natural gas and other petroleum resource” means natural gas and other petroleum resource located onshore in an economically inaccessible geological formation.

## Subtitle F—Science

### PART 1—AUTHORIZATION OF APPROPRIATIONS

#### SEC. 161. SCIENCE.

(a) IN GENERAL.—The following sums are authorized to be appropriated to the Secretary for research, development, demonstration, and commercial application activities of the Office of Science, including activities authorized under this subtitle, including the amounts authorized under the amendment made by section 170(c)(2)(C), and including basic energy sciences, advanced scientific and computing research, biological and environmental research, fusion energy sciences, high energy physics, nuclear physics, and research analysis and infrastructure support:

- (1) For fiscal year 2004, \$3,785,000,000.
- (2) For fiscal year 2005, \$4,153,000,000.
- (3) For fiscal year 2006, \$4,618,000,000.
- (4) For fiscal year 2007, \$5,310,000,000.

(b) ALLOCATIONS.—From amounts authorized under subsection (a), the following sums are authorized:

(1) FUSION ENERGY SCIENCES.—(A) For the Fusion Energy Sciences Program, excluding activities under sections 161A and 162—

- (i) for fiscal year 2004, \$276,000,000;
- (ii) for fiscal year 2005, \$300,000,000;
- (iii) for fiscal year 2006, \$340,000,000; and
- (iv) for fiscal year 2007, \$350,000,000.

(B) For activities under section 161A and for the project described in section 162—

- (i) for fiscal year 2004, \$12,000,000;
- (ii) for fiscal year 2005, \$20,000,000;
- (iii) for fiscal year 2006, \$50,000,000; and
- (iv) for fiscal year 2007, \$75,000,000.

(2) SPALLATION NEUTRON SOURCE.—

(A) CONSTRUCTION.—For construction of the Spallation Neutron Source—

- (i) for fiscal year 2004, \$124,600,000;
- (ii) for fiscal year 2005, \$79,800,000; and
- (iii) for fiscal year 2006, \$41,100,000 for completion of construction.

(B) OTHER PROJECT FUNDING.—For other project costs (including research and development necessary to complete the project, preoperations costs, and capital equipment related to construction) of the Spallation Neutron Source, \$103,279,000 for the period encompassing fiscal years 2003 through 2006, to remain available until expended through September 30, 2006.

(3) NANOTECHNOLOGY RESEARCH AND DEVELOPMENT.—For activities under section 169—

- (A) for fiscal year 2004, \$265,000,000;
- (B) for fiscal year 2005, \$292,000,000;
- (C) for fiscal year 2006, \$322,000,000; and
- (D) for fiscal year 2007, \$355,000,000.

(4) GENOMES TO LIFE.—

(A) TOTAL AUTHORIZATION.—For activities under section 170B—

- (i) \$100,000,000 for fiscal year 2004; and
- (ii) such sums as may be necessary for fiscal years 2005 through 2007.

(B) USER FACILITIES AND ANCILLARY EQUIPMENT.—From the amounts authorized under subparagraph (A), the following sums are authorized to be appropriated to carry out section 170B(e)—

- (i) \$16,000,000 for fiscal year 2004; and
- (ii) such sums as may be necessary for fiscal years 2005 through 2007.

(5) SCIENCE AND TECHNOLOGY SCHOLARSHIP PROGRAM.—For activities under section 170C—

- (A) for fiscal year 2004, \$800,000;
- (B) for fiscal year 2005, \$1,600,000;
- (C) for fiscal year 2006, \$2,000,000; and
- (D) for fiscal year 2007, \$2,000,000.

(c) LIMITS ON USE OF FUNDS.—Of the funds authorized under subsection (b)(1), no funds shall be available for implementation of the plan described in section 162.

## PART 2—FUSION ENERGY SCIENCES

### SEC. 161A. ITER.

(a) **IN GENERAL.**—The United States is authorized to participate in ITER in accordance with the provisions of this section.

(b) **AGREEMENT.**—(1) The Secretary is authorized to negotiate an agreement for United States participation in ITER.

(2) Any agreement for United States participation in ITER shall, at a minimum—

(A) clearly define the United States financial contribution to construction and operating costs;

(B) ensure that the share of ITER's high-technology components manufactured in the United States is at least proportionate to the United States financial contribution to ITER;

(C) ensure that the United States will not be financially responsible for cost overruns in components manufactured in other ITER participating countries;

(D) guarantee the United States full access to all data generated by ITER;

(E) enable United States researchers to propose and carry out an equitable share of the experiments at ITER;

(F) provide the United States with a role in all collective decisionmaking related to ITER; and

(G) describe the process for discontinuing or decommissioning ITER and any United States role in those processes.

(c) **PLAN.**—The Secretary, in consultation with the Fusion Energy Sciences Advisory Committee, shall develop a plan for the participation of United States scientists in ITER that shall include the United States research agenda for ITER, methods to evaluate whether ITER is promoting progress toward making fusion a reliable and affordable source of power, and a description of how work at ITER will relate to other elements of the United States fusion program. The Secretary shall request a review of the plan by the National Academy of Sciences.

(d) **LIMITATION.**—No funds shall be expended for the construction of ITER until the Secretary has transmitted to the Congress—

(1) the agreement negotiated pursuant to subsection (b) and 120 days have elapsed since that transmission;

(2) a report describing the management structure of ITER and providing a fixed dollar estimate of the cost of United States participation in the construction of ITER, and 120 days have elapsed since that transmission;

(3) a report describing how United States participation in ITER will be funded without reducing funding for other programs in the Office of Science, including other fusion programs, and 60 days have elapsed since that transmission; and

(4) the plan required by subsection (c) (but not the National Academy of Sciences review of that plan), and 60 days have elapsed since that transmission.

(e) **DEFINITIONS.**—In this section—

(1) the term “construction” means the physical construction of the ITER facility, and the physical construction, purchase, or manufacture of equipment or components that are specifically designed for the ITER facility, but does not mean the design of the facility, equipment, or components; and

(2) the term “ITER” means the international burning plasma fusion research project in which the President announced United States participation on January 30, 2003.

### SEC. 162. PLAN FOR FUSION EXPERIMENT.

(a) **IN GENERAL.**—If at any time during the negotiations on ITER, the Secretary determines that construction and operation of ITER is unlikely or infeasible, the Secretary shall send to Congress, as part of the budget request for the following year, a plan for implementing the domestic burning plasma experiment known as FIRE, including costs and schedules for such a plan. The Secretary shall refine such plan in full consultation with the Fusion Energy Sciences Advisory Committee and shall also transmit such plan to the National Academy of Sciences for review.

(b) **DEFINITIONS.**—As used in this section—

(1) the term “ITER” has the meaning given that term in section 161A; and

(2) the term “FIRE” means the Fusion Ignition Research Experiment, the fusion research experiment for which design work has been supported by the Department as a possible alternative burning plasma experiment in the event that ITER fails to move forward.

### SEC. 163. PLAN FOR FUSION ENERGY SCIENCES PROGRAM.

(a) **DECLARATION OF POLICY.**—It shall be the policy of the United States to conduct research, development, demonstration, and commercial application to provide

for the scientific, engineering, and commercial infrastructure necessary to ensure that the United States is competitive with other nations in providing fusion energy for its own needs and the needs of other nations, including by demonstrating electric power or hydrogen production for the United States energy grid utilizing fusion energy at the earliest date possible.

(b) FUSION ENERGY PLAN.—

(1) IN GENERAL.—Within 6 months after the date of enactment of this Act, the Secretary shall transmit to Congress a plan for carrying out the policy set forth in subsection (a), including cost estimates, proposed budgets, potential international partners, and specific programs for implementing such policy.

(2) REQUIREMENTS OF PLAN.—Such plan shall also ensure that—

- (A) existing fusion research facilities are more fully utilized;
- (B) fusion science, technology, theory, advanced computation, modeling, and simulation are strengthened;
- (C) new magnetic and inertial fusion research facilities are selected based on scientific innovation, cost effectiveness, and their potential to advance the goal of practical fusion energy at the earliest date possible;
- (D) such facilities that are selected are funded at a cost-effective rate;
- (E) communication of scientific results and methods between the fusion energy science community and the broader scientific and technology communities is improved;
- (F) inertial confinement fusion facilities are utilized to the extent practicable for the purpose of inertial fusion energy research and development; and
- (G) attractive alternative inertial and magnetic fusion energy approaches are more fully explored.

(3) REPORT ON FUSION MATERIALS AND TECHNOLOGY PROJECT.—In addition, the plan required by this subsection shall also address the status of, and to the degree possible, the costs and schedules for—

- (A) the design and implementation of international or national facilities for the testing of fusion materials; and
- (B) the design and implementation of international or national facilities for the testing and development of key fusion technologies.

### PART 3—SPALLATION NEUTRON SOURCE

**SEC. 164. DEFINITION.**

For the purposes of this part, the term “Spallation Neutron Source” means Department Project 99–E–334, Oak Ridge National Laboratory, Oak Ridge, Tennessee.

**SEC. 165. REPORT.**

The Secretary shall report on the Spallation Neutron Source as part of the Department’s annual budget submission, including a description of the achievement of milestones, a comparison of actual costs to estimated costs, and any changes in estimated project costs or schedule.

**SEC. 166. LIMITATIONS.**

The total amount obligated by the Department, including prior year appropriations, for the Spallation Neutron Source may not exceed—

- (1) \$1,192,700,000 for costs of construction;
- (2) \$219,000,000 for other project costs; and
- (3) \$1,411,700,000 for total project cost.

### PART 4—MISCELLANEOUS

**SEC. 167. FACILITY AND INFRASTRUCTURE SUPPORT FOR NONMILITARY ENERGY LABORATORIES.**

(a) FACILITY POLICY.—The Secretary shall develop and implement a strategy for the nonmilitary energy laboratories and facilities of the Office of Science. Such strategy shall provide a cost-effective means for—

- (1) maintaining existing facilities and infrastructure, as needed;
- (2) closing unneeded facilities;
- (3) making facility modifications; and
- (4) building new facilities.

(b) REPORT.—

(1) TRANSMITTAL.—The Secretary shall prepare and transmit, along with the President’s budget request to the Congress for fiscal year 2005, a report containing the strategy developed under subsection (a).

(2) CONTENTS.—For each nonmilitary energy laboratory and facility, such report shall contain—

- (A) the current priority list of proposed facilities and infrastructure projects, including cost and schedule requirements;
- (B) a current ten-year plan that demonstrates the reconfiguration of its facilities and infrastructure to meet its missions and to address its long-term operational costs and return on investment;
- (C) the total current budget for all facilities and infrastructure funding; and
- (D) the current status of each facilities and infrastructure project compared to the original baseline cost, schedule, and scope.

**SEC. 168. RESEARCH REGARDING PRECIOUS METAL CATALYSIS.**

From the amounts authorized to be appropriated to the Secretary under section 161, such sums as may be necessary for each of the fiscal years 2004, 2005, and 2006 may be used to carry out research in the use of precious metals (excluding platinum, palladium, and rhodium) in catalysis.

**SEC. 169. NANOTECHNOLOGY RESEARCH AND DEVELOPMENT.**

(a) IN GENERAL.—The Secretary, acting through the Office of Science, shall implement a Nanotechnology Research and Development Program to promote nanotechnology research, development, demonstration, education, technology transfer, and commercial application activities as necessary to ensure continued United States leadership in nanotechnology across scientific and engineering disciplines.

(b) PROGRAM ACTIVITIES.—The activities of the Nanotechnology Research and Development Program shall be designed to—

(1) provide sustained support for nanotechnology research and development through—

- (A) grants to individual investigators and interdisciplinary teams of investigators; and
- (B) establishment of interdisciplinary research centers and advanced technology user facilities;

(2) ensure that solicitation and evaluation of proposals under the Program encourage interdisciplinary research;

(3) expand education and training of undergraduate and graduate students in interdisciplinary nanotechnology science and engineering;

(4) accelerate the commercial application of nanotechnology innovations in the private sector;

(5) ensure that societal and ethical concerns will be addressed as the technology is developed by—

- (A) establishing a research program to identify societal and ethical concerns related to nanotechnology, and ensuring that the results of such research are widely disseminated; and
- (B) integrating, insofar as possible, research on societal and ethical concerns with nanotechnology research and development; and

(6) ensure that the potential of nanotechnology to produce or facilitate the production of clean, inexpensive energy is realized by supporting nanotechnology energy applications research and development.

(c) DEFINITIONS.—For the purposes of this section—

(1) the term “nanotechnology” means science and engineering aimed at creating materials, devices, and systems at the atomic and molecular level; and

(2) the term “advanced technology user facility” means a nanotechnology research and development facility supported, in whole or in part, by Federal funds that is open to all United States researchers on a competitive, merit-reviewed basis.

(d) REPORT.—Within 2 years after the date of enactment of this Act, the Secretary shall transmit to the Congress a report describing the projects to identify societal and ethical concerns related to nanotechnology and the funding provided to support these projects.

**SEC. 170. ADVANCED SCIENTIFIC COMPUTING FOR ENERGY MISSIONS.**

(a) IN GENERAL.—The Secretary, acting through the Office of Science, shall support a program to advance the Nation’s computing capability across a diverse set of grand challenge computationally based science problems related to departmental missions.

(b) DUTIES OF THE OFFICE OF SCIENCE.—In carrying out the program under this section, the Office of Science shall—

- (1) advance basic science through computation by developing software to solve grand challenge science problems on new generations of computing platforms;

- (2) enhance the foundations for scientific computing by developing the basic mathematical and computing systems software needed to take full advantage of the computing capabilities of computers with peak speeds of 100 teraflops or more, some of which may be unique to the scientific problem of interest;
  - (3) enhance national collaborative and networking capabilities by developing software to integrate geographically separated researchers into effective research teams and to facilitate access to and movement and analysis of large (petabyte) data sets;
  - (4) develop and maintain a robust scientific computing hardware infrastructure to ensure that the computing resources needed to address departmental missions are available; and
  - (5) explore new computing approaches and technologies that promise to advance scientific computing.
- (c) HIGH-PERFORMANCE COMPUTING ACT OF 1991 AMENDMENTS.—The High-Performance Computing Act of 1991 is amended—
- (1) in section 4 (15 U.S.C. 5503)—
    - (A) in paragraph (3)—
      - (i) by striking “means” and inserting “and ‘networking and information technology’ mean”; and
      - (ii) by striking “(including vector supercomputers and large scale parallel systems)”; and
    - (B) in paragraph (4), by striking “packet switched”; and
  - (2) in section 203 (15 U.S.C. 5523)—
    - (A) in subsection (a), by striking all after “As part of the” and inserting “Networking and Information Technology Research and Development Program, the Secretary of Energy shall conduct basic and applied research in networking and information technology, with emphasis on—
      - “(1) supporting fundamental research in the physical sciences and engineering, and energy applications;
      - “(2) providing supercomputer access and advanced communication capabilities and facilities to scientific researchers; and
      - “(3) developing tools for distributed scientific collaboration.”;
    - (B) in subsection (b), by striking “Program” and inserting “Networking and Information Technology Research and Development Program”; and
    - (C) by amending subsection (e) to read as follows:
      - “(e) AUTHORIZATION OF APPROPRIATIONS.—There are authorized to be appropriated to the Secretary of Energy to carry out the Networking and Information Technology Research and Development Program such sums as may be necessary for fiscal years 2004 through 2007.”.
  - (d) COORDINATION.—The Secretary shall ensure that the program under this section is integrated and consistent with—
    - (1) the Accelerated Strategic Computing Initiative of the National Nuclear Security Administration; and
    - (2) other national efforts related to advanced scientific computing for science and engineering.
  - (e) REPORT.—(1) Before undertaking any new initiative to develop new advanced architecture for high-speed computing, the Secretary, through the Director of the Office of Science, shall transmit a report to the Congress describing—
    - (A) the expected duration and cost of the initiative;
    - (B) the technical milestones the initiative is designed to achieve;
    - (C) how institutions of higher education and private firms will participate in the initiative; and
    - (D) why the goals of the initiative could not be achieved through existing programs.
  - (2) No funds may be expended on any initiative described in paragraph (1) until 30 days after the report required by that paragraph is transmitted to the Congress.

**SEC. 170A. NITROGEN FIXATION.**

The Secretary, acting through the Office of Science, shall support a program of research, development, demonstration, and commercial application on biological nitrogen fixation, including plant genomics research relevant to the development of commercial crop varieties with enhanced nitrogen fixation efficiency and ability.

**PART 5—GENOMES TO LIFE**

**SEC. 170B. GENOMES TO LIFE.**

- (a) FINDINGS.—The Congress finds the following:

(1) The Department's Genomes to Life initiative involves the emerging fields of systems biology and proteomics, which address the ability to understand the composition and function of the biochemical networks and pathways that carry out the essential processes of living organisms.

(2) The Genomes to Life initiative builds on the Department's integral role in the Human Genome Project, which has led to the mapping, sequencing, and identification of genetic material. Genomes to Life will go beyond mapping to develop an understanding of how genetic components interact to perform cellular activities vital to life.

(3) The ability of the United States to respond to the national security, energy, and environmental challenges of the 21st century will be driven by science and technology. An integrated and predictive understanding of biological systems will enable the United States to develop new technologies related to the detection of biological and chemical agents, energy production, carbon sequestration, bioremediation, and other Department statutory missions. These advances will also enhance the strength of United States science, technology, and medicine generally.

(4) The fundamental intellectual challenges inherent in the Genomes to Life initiative are considerable, and require public support for basic and applied research and development. Significant advances in areas such as the characterization of multiprotein complexes and gene regulatory networks will be required before biologically-based solutions and technologies will be useful in national security applications, as well as to the energy, medical, and agricultural industries.

(5) The development of new scientific instruments will also be required to advance Genomes to Life research. Such instruments are likely to be large and costly. Specialized facilities are also likely to be required in order to advance the field and to realize its promise. Such facilities will be sufficiently expensive that they will have to be located and constructed on a centralized basis, similar to a number of unique facilities already managed by the Department.

(6) Contributions from individual researchers as well as multidisciplinary research teams will be required to advance systems biology and proteomics.

(7) The Department's Office of Science is well suited to manage systems biology and proteomics research for the Department. Through its support of research and development pursuant to the Department's statutory authorities, the Office of Science is the principal Federal supporter of research and development in the physical and computational sciences. The Office is also a significant source of Federal support for research in genomics and the life sciences. The Office supports research and development by individual investigators and multidisciplinary teams, and manages special user facilities that serve investigators in both university and industry.

(b) ESTABLISHMENT OF PROGRAM.—The Secretary shall carry out a program of research, development, demonstration, and commercial application, to be known as the Genomes to Life Program, in systems biology and proteomics.

(c) PLANNING.—

(1) IN GENERAL.—Within one year after the date of enactment of this Act, the Secretary shall prepare and transmit to Congress a Program plan describing how knowledge and capabilities would be developed by the Program and applied to Department missions relating to energy, environmental cleanup, and stabilization of atmospheric levels of carbon dioxide.

(2) CONSULTATION.—The Program plan will be developed in consultation with other relevant Department technology programs and other relevant Federal agencies.

(3) LONG-TERM GOALS.—The Program plan shall focus science and technology on long-term goals including—

- (A) contributing to United States independence from foreign energy sources;
- (B) stabilizing atmospheric levels of carbon dioxide;
- (C) advancing environmental cleanup; and
- (D) providing the science and technology basis for new industries in biotechnology.

(4) SPECIFIC GOALS.—The Program plan shall identify appropriate research, development, demonstration, and commercial application activities to address the following issues within the next decade:

- (A) Identifying new biological sources of fuels and electricity, with particular emphasis on creating biological technologies for the production and utilization of hydrogen.
- (B) Understanding the Earth's natural carbon cycle and creating strategies to stabilize atmospheric carbon dioxide.

(C) Developing a knowledge and capability base for exploring more cost-effective cleanup strategies for Department sites.

(D) Capturing key biological processes in engineered systems not requiring living cells.

(5) REVIEW.—The Secretary shall enter into an arrangement with the National Academy of Sciences to review the plan developed under this subsection. The Secretary shall transmit the review to the Congress not later than 6 months after the transmittal of the Program plan under paragraph (1), along with an explanation of any differences between the plan and the recommendations of the Academy.

(d) PROGRAM EXECUTION.—In carrying out the Program under this section, the Secretary shall—

(1) support individual investigators and multidisciplinary teams of investigators;

(2) subject to subsection (e), develop, plan, construct, acquire, or operate special equipment or facilities for the use of investigators conducting research, development, demonstration, or commercial application in systems biology and proteomics;

(3) support technology transfer activities to benefit industry and other users of systems biology and proteomics; and

(4) coordinate activities by the Department with academia, industry, and other Federal agencies.

(e) USER FACILITIES AND ANCILLARY EQUIPMENT.—

(1) FACILITIES.—As part of the Genomes to Life Program, the Secretary is authorized to develop, plan, construct, acquire, or operate special equipment, instrumentation, or facilities for investigators conducting research, development, demonstration, and commercial application projects in systems biology and proteomics and associated biological disciplines.

(2) PROJECTS.—Projects referred to in paragraph (1) may include—

(A) the identification and characterization of multiprotein complexes;

(B) characterization of gene regulatory networks;

(C) characterization of the functional repertoire of complex microbial communities in their natural environments at the molecular level; and

(D) development of computational methods and capabilities to advance understanding of complex biological systems and predict their behavior.

(3) FACILITIES.—Facilities supported under paragraph (1) may include facilities for—

(A) the production and characterization of proteins;

(B) whole proteome analysis;

(C) characterization and imaging of molecular machines; and

(D) analysis and modeling of cellular systems.

(4) COLLABORATION.—The Secretary shall encourage collaborations among universities, laboratories, and industry at facilities supported under this subsection. All facilities supported under this subsection shall have a specific mission of technology transfer to other institutions.

(f) DEFINITIONS.—For purposes of this section:

(1) PROGRAM.—The term “Program” means the Genomes to Life Program carried out under this section.

(2) PROTEOMICS.—The term “proteomics” means the determination of the structure, function, and expression of the proteins encoded in any genome, including new protein sequences encoded in a genome for which the structural or functional correlates are not currently known.

**SEC. 170C. DEPARTMENT OF ENERGY SCIENCE AND TECHNOLOGY SCHOLARSHIP PROGRAM.**

(a) ESTABLISHMENT OF PROGRAM.—

(1) IN GENERAL.—The Secretary shall establish a Department of Energy Science and Technology Scholarship Program to award scholarships to individuals that is designed to recruit and prepare students for careers in the Department.

(2) COMPETITIVE PROCESS.—Individuals shall be selected to receive scholarships under this section through a competitive process primarily on the basis of academic merit, with consideration given to financial need and 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).

(3) SERVICE AGREEMENTS.—To carry out the Program the Secretary shall enter into contractual agreements with individuals selected under paragraph (2) under which the individuals agree to serve as full-time employees of the Department, for the period described in subsection (f)(1), in positions needed by the

Department and for which the individuals are qualified, in exchange for receiving a scholarship.

(b) SCHOLARSHIP ELIGIBILITY.—In order to be eligible to participate in the Program, an individual must—

(1) be enrolled or accepted for enrollment as a full-time student at an institution of higher education in an academic program or field of study described in the list made available under subsection (d);

(2) be a United States citizen; and

(3) at the time of the initial scholarship award, not be a Federal employee as defined in section 2105 of title 5 of the United States Code.

(c) APPLICATION REQUIRED.—An individual seeking a scholarship under this section shall submit an application to the Secretary at such time, in such manner, and containing such information, agreements, or assurances as the Secretary may require.

(d) ELIGIBLE ACADEMIC PROGRAMS.—The Secretary shall make publicly available a list of academic programs and fields of study for which scholarships under the Program may be utilized, and shall update the list as necessary.

(e) SCHOLARSHIP REQUIREMENT.—

(1) IN GENERAL.—The Secretary may provide a scholarship under the Program for an academic year if the individual applying for the scholarship has submitted to the Secretary, as part of the application required under subsection (c), a proposed academic program leading to a degree in a program or field of study on the list made available under subsection (d).

(2) DURATION OF ELIGIBILITY.—An individual may not receive a scholarship under this section for more than 4 academic years, unless the Secretary grants a waiver.

(3) SCHOLARSHIP AMOUNT.—The dollar amount of a scholarship under this section for an academic year shall be determined under regulations issued by the Secretary, but shall in no case exceed the cost of attendance.

(4) AUTHORIZED USES.—A scholarship provided under this section may be expended for tuition, fees, and other authorized expenses as established by the Secretary by regulation.

(5) CONTRACTS REGARDING DIRECT PAYMENTS TO INSTITUTIONS.—The Secretary may enter into a contractual agreement with an institution of higher education under which the amounts provided for a scholarship under this section for tuition, fees, and other authorized expenses are paid directly to the institution with respect to which the scholarship is provided.

(f) PERIOD OF OBLIGATED SERVICE.—

(1) DURATION OF SERVICE.—The period of service for which an individual shall be obligated to serve as an employee of the Department is, except as provided in subsection (h)(2), 24 months for each academic year for which a scholarship under this section is provided.

(2) SCHEDULE FOR SERVICE.—(A) Except as provided in subparagraph (B), obligated service under paragraph (1) shall begin not later than 60 days after the individual obtains the educational degree for which the scholarship was provided.

(B) The Secretary may defer the obligation of an individual to provide a period of service under paragraph (1) if the Secretary determines that such a deferral is appropriate. The Secretary shall prescribe the terms and conditions under which a service obligation may be deferred through regulation.

(g) PENALTIES FOR BREACH OF SCHOLARSHIP AGREEMENT.—

(1) FAILURE TO COMPLETE ACADEMIC TRAINING.—Scholarship recipients who fail to maintain a high level of academic standing, as defined by the Secretary by regulation, who are dismissed from their educational institutions for disciplinary reasons, or who voluntarily terminate academic training before graduation from the educational program for which the scholarship was awarded, shall be in breach of their contractual agreement and, in lieu of any service obligation arising under such agreement, shall be liable to the United States for repayment within 1 year after the date of default of all scholarship funds paid to them and to the institution of higher education on their behalf under the agreement, except as provided in subsection (h)(2). The repayment period may be extended by the Secretary when determined to be necessary, as established by regulation.

(2) FAILURE TO BEGIN OR COMPLETE THE SERVICE OBLIGATION OR MEET THE TERMS AND CONDITIONS OF DEFERMENT.—Scholarship recipients who, for any reason, fail to begin or complete their service obligation after completion of academic training, or fail to comply with the terms and conditions of deferment established by the Secretary pursuant to subsection (f)(2)(B), shall be in breach of their contractual agreement. When recipients breach their agreements for the

reasons stated in the preceding sentence, the recipient shall be liable to the United States for an amount equal to—

(A) the total amount of scholarships received by such individual under this section; plus

(B) the interest on the amounts of such awards which would be payable if at the time the awards were received they were loans bearing interest at the maximum legal prevailing rate, as determined by the Treasurer of the United States,

multiplied by 3.

(h) WAIVER OR SUSPENSION OF OBLIGATION.—

(1) DEATH OF INDIVIDUAL.—Any obligation of an individual incurred under the Program (or a contractual agreement thereunder) for service or payment shall be canceled upon the death of the individual.

(2) IMPOSSIBILITY OR EXTREME HARDSHIP.—The Secretary shall by regulation provide for the partial or total waiver or suspension of any obligation of service or payment incurred by an individual under the Program (or a contractual agreement thereunder) whenever compliance by the individual is impossible or would involve extreme hardship to the individual, or if enforcement of such obligation with respect to the individual would be contrary to the best interests of the Government.

(i) DEFINITIONS.—In this section the following definitions apply:

(1) COST OF ATTENDANCE.—The term “cost of attendance” has the meaning given that term in section 472 of the Higher Education Act of 1965 (20 U.S.C. 1087*ll*).

(2) 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)).

(3) PROGRAM.—The term “Program” means the Department of Energy Science and Technology Scholarship Program established under this section.

## Subtitle G—Energy and Environment

### SEC. 171. AUTHORIZATION OF APPROPRIATIONS.

(a) UNITED STATES-MEXICO ENERGY TECHNOLOGY COOPERATION.—The following sums are authorized to be appropriated to the Secretary to carry out activities under section 172:

(1) For fiscal year 2004, \$5,000,000.

(2) For fiscal year 2005, \$6,000,000.

(3) For fiscal year 2006, \$6,000,000.

(4) For fiscal year 2007, \$6,000,000.

(b) WASTE REDUCTION AND USE OF ALTERNATIVES.—There are authorized to be appropriated to the Secretary to carry out activities under section 173, \$500,000 for fiscal year 2004.

### SEC. 172. UNITED STATES-MEXICO ENERGY TECHNOLOGY COOPERATION.

(a) PROGRAM.—The Secretary shall establish a research, development, demonstration, and commercial application program to be carried out in collaboration with entities in Mexico and the United States to promote energy efficient, environmentally sound economic development along the United States-Mexico border.

(b) PROGRAM MANAGEMENT.—The program under subsection (a) shall be managed by the Department of Energy Carlsbad Environmental Management Field Office.

(c) TECHNOLOGY TRANSFER.—In carrying out projects and activities under this section, the Secretary shall assess the applicability of technology developed under the Environmental Management Science Program of the Department.

(d) INTELLECTUAL PROPERTY.—In carrying out this section, the Secretary shall comply with the requirements of any agreement entered into between the United States and Mexico regarding intellectual property protection.

### SEC. 173. WASTE REDUCTION AND USE OF ALTERNATIVES.

(a) GRANT AUTHORITY.—The Secretary is authorized to make a single grant to a qualified institution to examine and develop the feasibility of burning post-consumer carpet in cement kilns as an alternative energy source. The purposes of the grant shall include determining—

(1) how post-consumer carpet can be burned without disrupting kiln operations;

(2) the extent to which overall kiln emissions may be reduced;

(3) the emissions of air pollutants and other relevant environmental impacts; and

(4) how this process provides benefits to both cement kiln operations and carpet suppliers.

(b) **QUALIFIED INSTITUTION.**—For the purposes of subsection (a), a qualified institution is a research-intensive institution of higher education with demonstrated expertise in the fields of fiber recycling and logistical modeling of carpet waste collection and preparation.

**SEC. 174. COAL GASIFICATION.**

The Secretary is authorized to provide loan guarantees for a project to produce energy from a plant using integrated gasification combined cycle technology of at least 400 megawatts in capacity that produces power at competitive rates in deregulated energy generation markets and that does not receive any subsidy (direct or indirect) from ratepayers.

**SEC. 175. PETROLEUM COKE GASIFICATION.**

The Secretary is authorized to provide loan guarantees for at least one petroleum coke gasification polygeneration project.

**SEC. 176. OTHER BIPOWER AND BIOENERGY.**

The Secretary shall conduct a program to assist in the planning, design, and implementation of projects to convert rice straw, rice hulls, sugarcane bagasse, forest thinnings, and barley grain into biopower and biofuels.

**SEC. 177. COAL TECHNOLOGY LOAN.**

There are authorized to be appropriated to the Secretary \$125,000,000 to provide a loan to the owner of the experimental plant constructed under United States Department of Energy cooperative agreement number DE-FC22-91PC99544 on such terms and conditions as the Secretary determines, including interest rates and upfront payments.

**SEC. 178. FUEL CELL TEST CENTER.**

(a) **STUDY.**—Not later than 1 year after the date of enactment of this Act, the Secretary shall transmit to the Congress a report on the results of a study of the establishment of a test center for next-generation fuel cells at an institution of higher education that has available a continuous source of hydrogen and access to the electric transmission grid. Such report shall include a conceptual design for such test center and a projection of the costs of establishing the test center.

(b) **AUTHORIZATION OF APPROPRIATIONS.**—There are authorized to be appropriated to the Secretary for carrying out this section \$500,000.

## Subtitle H—Hydrogen

**SEC. 181. SHORT TITLE.**

This subtitle may be cited as the “George E. Brown, Jr. and Robert S. Walker Hydrogen Future Act of 2003”.

**SEC. 182. MATSUNAGA ACT AMENDMENT.**

The Spark M. Matsunaga Hydrogen Research, Development, and Demonstration Act of 1990 (42 U.S.C. 12401 et seq.) is amended by striking sections 102 through 109 and inserting the following:

**“SEC. 102. FINDINGS AND DEFINITIONS.**

**“(a) FINDINGS.**—Congress finds that—

“(1) the United States is currently dependent on foreign sources for a majority of its petroleum supply;

“(2) the Nation’s dependence on foreign petroleum is expected to increase in the decades ahead;

“(3) it is in the national interest to reduce dependence on imported petroleum by accelerating Federal efforts to partner with the private sector in developing hydrogen and fuel cell technologies;

“(4) it is in the national interest to support industry’s efforts to develop a light duty vehicle fleet that is free or near free of pollutant emissions and greenhouse gas emissions, and that helps to reduce the Nation’s dependence on petroleum in a manner that maintains the freedom of consumers to purchase the kinds of vehicles they wish to drive and the freedom to refuel those vehicles safely and affordably;

“(5) the development of hydrogen fuel cell vehicles and supporting infrastructure will benefit from and accelerate the parallel advancement of fuel cells for stationary power that will enhance the resiliency, reliability, and environmental performance of the Nation’s electricity infrastructure;

“(6) fuel cell technology for consumer electronics and portable power will benefit from, and advance the development of, hydrogen fuel cell vehicles and supporting infrastructure;

“(7) there is a need for deployment of bridging technologies that can contribute to reducing petroleum demand and decreasing air emissions, including—

“(A) gasoline-electric and diesel-electric hybrid drive systems;

“(B) advanced combustion engines (including clean diesel), electric battery, and power electronics; and

“(C) alternative fuels and other technologies;

“(8) low-cost hydrogen production, storage, and delivery facilities are essential to the success of the FreedomCAR program; and

“(9) vehicle technology development work should be performed in a manner that is cognizant of consumer acceptance and marketplace success.

“(b) DEFINITIONS.—In this Act:

“(1) The term ‘Advisory Committee’ means the Hydrogen Technical and Fuel Cell Advisory Committee established under section 108 of this Act.

“(2) The term ‘Department’ means the Department of Energy.

“(3) The term ‘fuel cell’ means a device that directly converts the chemical energy of a fuel and an oxidant into electricity by an electrochemical process taking place at separate electrodes in the device.

“(4) The term ‘FreedomCAR’ is the acronym for a Department initiative in automotive research and development entitled ‘Freedom Cooperative Automotive Research’.

“(5) The term ‘infrastructure’ means the equipment, systems, or facilities used to produce, distribute, deliver, or store hydrogen and other advanced clean fuels.

“(6) The term ‘light duty vehicle’ means a car or truck classified by the Department of Transportation as a Class I or IIA vehicle.

“(7) The term ‘Secretary’ means the Secretary of Energy.

**“SEC. 103. PROGRAM.**

“(a) IN GENERAL.—The Secretary shall conduct a research, development, demonstration, and commercial application program designed to accelerate the use of hydrogen and related technologies in stationary and transportation applications. The goals of the program shall include—

“(1) to enable a decision by automakers not later than 2015 to offer affordable and technically viable hydrogen fuel cell vehicles in the mass consumer market;

“(2) to enable production and delivery to consumers of model year 2020 hydrogen fuel cell vehicles that will have—

“(A) a range of at least three hundred miles;

“(B) safety and performance comparable to vehicle technologies in the market; and

“(C) when compared to light duty vehicles in model year 2003—

“(i) a fuel economy that is two and one half times the equivalent fuel economy of comparable light duty vehicles in model year 2003; and

“(ii) zero or near zero emissions of pollutants; and

“(D) vehicle fuel system crash integrity and occupant protection; and

“(3) to enable by 2020 the safe and convenient commercial production and delivery of hydrogen that will have—

“(A) the capacity to meet the demand for stationary and mobile hydrogen fuel cells;

“(B) safety and performance characteristics comparable to other fuels; and

“(C) improved overall efficiency and zero or near zero emissions when compared to fuels used in 2003.

“(b) ACTIVITIES.—The program authorized under this section shall address—

“(1) production of hydrogen from diverse energy sources, including—

“(A) fossil fuels, in conjunction with carbon capture and sequestration;

“(B) hydrogen-carrier fuels (including ethanol and methanol);

“(C) renewable energy resources; and

“(D) nuclear energy;

“(2) delivery of hydrogen or hydrogen-carrier fuels, including—

“(A) transmission by pipeline and other distribution methods; and

“(B) safe, convenient, and economic refueling of vehicles either at central refueling stations or through distributed on-site generation;

“(3) storage of hydrogen or hydrogen-carrier fuels, including development of materials for safe and economic storage in gaseous, liquid, or solid form at refueling facilities and onboard vehicles;

“(4) development of safe, durable, affordable, and efficient fuel cells, including research and development on fuel-flexible fuel cell power systems, improved

manufacturing processes, high-temperature membranes, cost-effective fuel processing for natural gas, fuel cell stack and system reliability, low temperature operation, and cold start capability; and

“(5) development, in conjunction with the National Institute of Standards and Technology, of necessary codes and standards (including international codes and standards) and safety practices for the production, distribution, storage, and use of hydrogen, hydrogen-carrier fuels and related products.

“(c) DEMONSTRATION.—In carrying out the demonstration program under this section, the Secretary shall fund a limited number of projects and shall, to the extent practicable—

“(1) select only projects that—

“(A) involve using hydrogen and related products at facilities or installations that would exist without the demonstration program, such as existing office buildings, military bases, vehicle fleet centers, transit bus authorities, or parks; and

“(B) depend on reliable power from hydrogen to carry out essential activities; and

“(2) favor projects that—

“(A) lead to the replication of hydrogen technologies and draw such technologies into the marketplace;

“(B) integrate in a single project both mobile and stationary applications of hydrogen fuel cells;

“(C) address the interdependency of demand for hydrogen fuel cell applications and hydrogen fuel infrastructure; or

“(D) raise awareness of hydrogen technology among the public.

“(d) MERIT REVIEW.—The Secretary shall carry out the program under this section using a competitive, merit-review process and consistent with the generally applicable Federal laws and regulations governing awards of financial assistance, contracts, or other agreements.

“(e) COST SHARING.—(1) For projects carried out through grants, cooperative agreements, or contracts under this section, the Secretary shall require a commitment from non-Federal sources of at least—

“(A) 20 percent of the cost of a research and development project; and

“(B) 50 percent of the cost of a demonstration project.

“(2) The Secretary may reduce the cost-sharing requirement under paragraph (1)—

“(A) if the Secretary determines that the project involves research of a basic or fundamental nature;

“(B) if the Secretary determines that a demonstration or commercial application project involves unusual technological risks; or

“(C) for technical analyses or other activities that the Secretary does not expect to result in a marketable product.

“(3) The Secretary may consider the size of the non-Federal share in selecting projects.

**“SEC. 104. FREEDOM CAR.**

“(a) IN GENERAL.—In coordination with the program under section 103, the Secretary shall carry out a research, development, demonstration, and commercial application program on advanced vehicle technologies, to be known as the FreedomCAR program.

“(b) ACTIVITIES.—The FreedomCAR program shall address—

“(1) engine and emission control systems;

“(2) energy storage, electric propulsion, and hybrid systems;

“(3) automotive materials;

“(4) clean fuels in addition to hydrogen; and

“(5) other advanced vehicle technologies.

“(c) DEMONSTRATION.—Demonstrations involving hydrogen shall be conducted as part of the program under section 103.

“(d) MERIT REVIEW AND COST SHARING.—The Secretary shall carry out the FreedomCAR program in compliance with sections 103(d) and (e).

**“SEC. 105. PLAN.**

“Not later than six months after the date of enactment of the George E. Brown, Jr. and Robert S. Walker Hydrogen Future Act of 2003, the Secretary shall transmit to the Congress a coordinated plan for the programs described in sections 103 and 104 and any other programs of the Department that are directly related to fuel cells or hydrogen. The plan shall be consistent with the National Hydrogen Energy Roadmap published by the Department in October of 2002 and shall describe, at a minimum—

“(1) the agenda for the programs for the next five years, including what research, development, demonstration, and commercial application will be conducted to carry out each activity enumerated in sections 103(b) and 104(b);

“(2) the role national laboratories, institutions of higher education, small businesses, and other private sector firms are expected to play in the programs;

“(3) the technical milestones that will be used to evaluate the programs for the next five years;

“(4) the most significant technical hurdles that stand in the way of achieving the goals described in section 103(a), and how the programs will address those hurdles; and

“(5) the policy assumptions that are driving the research agenda, including any assumptions that would affect the sources of hydrogen or the marketability of hydrogen-related products.

**“SEC. 106. EDUCATION, OUTREACH, AND TECHNOLOGY TRANSFER.**

“(a) **IN GENERAL.**—The Secretary may carry out programs and activities for interagency, intergovernmental, and international education, information exchange, and cooperation related to hydrogen and hydrogen-related products.

“(b) **TECHNOLOGY TRANSFER.**—(1) The Secretary may conduct a program to transfer technology to the private sector under this Act. The purpose of the technology transfer program is to foster the exchange of generic, nonproprietary information and technology, developed under this Act, among industry, academia, and the Federal Government, to help the United States economy attain the economic benefits of this information and technology, among other purposes.

“(2) The Secretary shall direct the program authorized by this subsection with the advice and assistance of the Advisory Committee.

**“SEC. 107. INTERAGENCY TASK FORCE.**

“(a) **ESTABLISHMENT.**—Not later than 120 days after the date of enactment of the George E. Brown, Jr. and Robert S. Walker Hydrogen Future Act of 2003, the President shall establish an interagency task force, chaired by the Director of the Office of Science and Technology Policy or his designee, with representatives from each of the following:

“(1) The Department of Energy.

“(2) The Department of Transportation.

“(3) The Department of State.

“(4) The Department of Defense.

“(5) The Department of Commerce (including the National Institute of Standards and Technology).

“(6) The Environmental Protection Agency.

“(7) The National Aeronautics and Space Administration.

“(8) Other Federal agencies as the Director determines appropriate.

“(b) **DUTIES.**—

“(1) **IMPLEMENTATION.**—The interagency task force shall work toward development of—

“(A) a safe, economical, and environmentally sound hydrogen infrastructure;

“(B) uniform hydrogen codes, standards, and safety protocols;

“(C) fuel cells in government applications, including portable, stationary, and transportation applications; and

“(D) vehicle hydrogen fuel system integrity safety performance.

“(2) **ACTIVITIES.**—The interagency task force may organize workshops and conferences, may issue publications, and may create databases to carry out its duties. The interagency task force shall—

“(A) foster the exchange of generic, nonproprietary information and technology among industry, academia, and government;

“(B) develop and maintain an inventory and assessment of hydrogen, fuel cells, and other advanced technologies, including the commercial capability of each technology for the economic and environmentally safe production, distribution, delivery, storage, and use of hydrogen;

“(C) integrate technical and other information made available as a result of the programs and activities under this Act;

“(D) promote the marketplace introduction of infrastructure for hydrogen-powered fuel cell vehicles; and

“(E) conduct an education program to provide hydrogen and fuel cell information to potential end-users in coordination with the program under section 106.

“(c) **AGENCY COOPERATION.**—The heads of all agencies, including those whose agencies are not represented on the interagency task force, shall cooperate with and furnish information to the interagency task force and the Department.

**“SEC. 108. ADVISORY COMMITTEE.**

“(a) **ESTABLISHMENT.**—The Hydrogen Technical and Fuel Cell Advisory Committee shall be established to advise the Secretary on the programs and activities under this Act.

“(b) **MEMBERSHIP.**—

“(1) **MEMBERS.**—The Secretary shall appoint not fewer than 12 nor more than 25 members. The Secretary shall appoint members to represent domestic industry, academia, professional societies, government agencies, and financial, environmental, and other appropriate organizations based on the Secretary’s assessment of the technical and other qualifications of committee members and the needs of the Advisory Committee.

“(2) **TERMS.**—The term of a member of the Advisory Committee shall be not more than three years. The Secretary may appoint members of the Advisory Committee in a manner that allows the terms of the members serving at any time to expire at spaced intervals so as to ensure continuity in the functioning of the Advisory Committee. A member of the Advisory Committee whose term is expiring may be reappointed.

“(3) **CHAIRPERSON.**—The Chair of the Advisory Committee shall be a member of the Advisory Committee, elected by the members from among their number.

“(c) **REVIEW.**—(1) The Advisory Committee shall review and make recommendations to the Secretary in a biennial report on—

“(A) the implementation of programs and activities under this Act; and

“(B) the safety, economical, environmental, and other consequences of technologies for the production, distribution, delivery, storage, or use of hydrogen and fuel cells.

“(2) The Secretary shall transmit the report under this subsection to the Congress along with a description of how the Secretary has implemented or plans to implement the recommendations, or an explanation of the reasons that a recommendation will not be implemented. The report shall be transmitted along with the President’s budget proposal.

“(d) **ADVISORY COMMITTEE SUPPORT.**—The Secretary shall provide resources necessary in the judgment of the Secretary for the Advisory Committee to carry out its responsibilities under this Act.

**“SEC. 109. EXTERNAL REVIEW.**

“(a) **PLAN.**—The Secretary shall enter into an arrangement with a competitively selected nongovernmental entity, such as the National Academy of Sciences, to review the plan prepared under section 105. The Secretary shall transmit the review to the Congress along with a plan to implement the review’s recommendations or an explanation of the reasons that a recommendation will not be implemented.

“(b) **BIENNIAL REVIEW.**—The Secretary shall enter into an arrangement with a competitively selected nongovernmental entity, such as the National Academy of Sciences, under which the entity will review the program under sections 103 and 104 every other year, beginning two years after the date of enactment of the George E. Brown, Jr. and Robert S. Walker Hydrogen Future Act of 2003. The entity shall review the research priorities, technical milestones, and plans for technology transfer and evaluate the progress toward achieving them. The Secretary shall transmit each review to the Congress along with a plan to implement the review’s recommendations or an explanation for the reasons that a recommendation will not be implemented.

**“SEC. 110. MISCELLANEOUS PROVISIONS.**

“(a) **DUPLICATION.**—The Secretary shall carry out the activities of this Act in a manner that avoids unnecessary duplication or displacement of, or competition with private sector activities.

“(b) **OTHER GOVERNMENTS.**—In carrying out this Act, the Secretary may enter into cost-sharing agreements with Federal, State, or local governments to demonstrate applications using hydrogen and fuel cells.

“(c) **REPRESENTATION.**—The Department may represent the United States interests with respect to activities and programs under this Act, in coordination with the Department of Transportation, the National Institute of Standards and Technology, and other relevant Federal agencies, before governments and nongovernmental organizations including—

“(1) other Federal, State, regional, and local governments and their representatives;

“(2) industry and its representatives, including members of the energy and transportation industries; and

“(3) in consultation with the Department of State, foreign governments and their representatives including international organizations.

“(d) REGULATORY AUTHORITY.—Nothing in this Act shall be construed to alter the regulatory authority of the Department.

**“SEC. 111. AUTHORIZATION OF APPROPRIATIONS.**

“There are authorized to be appropriated to carry out this Act, in addition to any amounts made available for these purposes under other Acts—

- “(1) \$273,500,000 for fiscal year 2004;
- “(2) \$325,000,000 for fiscal year 2005;
- “(3) \$375,000,000 for fiscal year 2006;
- “(4) \$400,000,000 for fiscal year 2007; and
- “(5) \$425,000,000 for fiscal year 2008.”.

**SEC. 183. REPEAL OF HYDROGEN FUTURE ACT OF 1996.**

The Hydrogen Future Act of 1996 is repealed.

## **Subtitle I—Management**

**SEC. 184. AVAILABILITY OF FUNDS.**

Funds authorized to be appropriated to the Department under this title shall remain available until expended.

**SEC. 185. COST SHARING.**

(a) RESEARCH AND DEVELOPMENT.—Except as otherwise provided in this title, for research and development programs carried out under this title, the Secretary shall require a commitment from non-Federal sources of at least 20 percent of the cost of the project. The Secretary may reduce or eliminate the non-Federal requirement under this subsection if the Secretary determines that the research and development is of a basic or fundamental nature.

(b) DEMONSTRATION AND COMMERCIAL APPLICATION.—Except as otherwise provided in this title, the Secretary shall require at least 50 percent of the costs directly and specifically related to any demonstration or commercial application project under this title to be provided from non-Federal sources. The Secretary may reduce the non-Federal requirement under this subsection if the Secretary determines that the reduction is necessary and appropriate considering the technological risks involved in the project and is necessary to meet the objectives of this title.

(c) CALCULATION OF AMOUNT.—In calculating the amount of the non-Federal commitment under subsection (a) or (b), the Secretary may include personnel, services, equipment, and other resources.

**SEC. 186. MERIT REVIEW OF PROPOSALS.**

Awards of funds authorized under this title shall be made only after an impartial review of the scientific and technical merit of the proposals for such awards has been carried out by or for the Department.

**SEC. 187. EXTERNAL TECHNICAL REVIEW OF DEPARTMENTAL PROGRAMS.**

(a) NATIONAL ENERGY RESEARCH AND DEVELOPMENT ADVISORY BOARDS.—(1) The Secretary shall establish one or more advisory boards to review Department research, development, demonstration, and commercial application programs in the following areas:

- (A) Energy efficiency.
- (B) Renewable energy.
- (C) Nuclear energy.
- (D) Fossil energy.

(2) The Secretary may designate an existing advisory board within the Department to fulfill the responsibilities of an advisory board under this subsection, and may enter into appropriate arrangements with the National Academy of Sciences to establish such an advisory board.

(b) OFFICE OF SCIENCE ADVISORY COMMITTEES.—

(1) UTILIZATION OF EXISTING COMMITTEES.—The Secretary shall continue to use the scientific program advisory committees chartered under the Federal Advisory Committee Act by the Office of Science to oversee research and development programs under that Office.

(2) SCIENCE ADVISORY COMMITTEE.—

(A) ESTABLISHMENT.—There shall be in the Office of Science a Science Advisory Committee that includes the chairs of each of the advisory committees described in paragraph (1).

(B) RESPONSIBILITIES.—The Science Advisory Committee shall—

(i) serve as the science advisor to the Assistant Secretary for Science created under section 209 of the Department of Energy Organization Act, as added by section 201 of this Act;

(ii) advise the Assistant Secretary with respect to the well-being and management of the National Laboratories and single-purpose research facilities;

(iii) advise the Assistant Secretary with respect to education and workforce training activities required for effective short-term and long-term basic and applied research activities of the Office of Science; and

(iv) advise the Assistant Secretary with respect to the well being of the university research programs supported by the Office of Science.

(c) MEMBERSHIP.—Each advisory board under this section shall consist of persons with appropriate expertise representing a diverse range of interests.

(d) MEETINGS AND PURPOSES.—Each advisory board under this section shall meet at least semi-annually to review and advise on the progress made by the respective research, development, demonstration, and commercial application program or programs. The advisory board shall also review the measurable cost and performance-based goals for such programs as established under section 3, and the progress on meeting such goals.

(e) PERIODIC REVIEWS AND ASSESSMENTS.—The Secretary shall enter into appropriate arrangements with the National Academy of Sciences to conduct periodic reviews and assessments of the programs authorized by this title, the measurable cost and performance-based goals for such programs as established under section 3, if any, and the progress on meeting such goals. Such reviews and assessments shall be conducted every 5 years, or more often as the Secretary considers necessary, and the Secretary shall transmit to the Congress reports containing the results of all such reviews and assessments.

#### SEC. 188. IMPROVED COORDINATION OF TECHNOLOGY TRANSFER ACTIVITIES.

(a) TECHNOLOGY TRANSFER COORDINATOR.—The Secretary shall designate a Technology Transfer Coordinator to perform oversight of and policy development for technology transfer activities at the Department. The Technology Transfer Coordinator shall coordinate the activities of the Technology Transfer Working Group, and shall oversee the expenditure of funds allocated to the Technology Transfer Working Group, and shall coordinate with each technology partnership ombudsman appointed under section 11 of the Technology Transfer Commercialization Act of 2000 (42 U.S.C. 7261c).

(b) TECHNOLOGY TRANSFER WORKING GROUP.—The Secretary shall establish a Technology Transfer Working Group, which shall consist of representatives of the National Laboratories and single-purpose research facilities, to—

(1) coordinate technology transfer activities occurring at National Laboratories and single-purpose research facilities;

(2) exchange information about technology transfer practices, including alternative approaches to resolution of disputes involving intellectual property rights and other technology transfer matters; and

(3) develop and disseminate to the public and prospective technology partners information about opportunities and procedures for technology transfer with the Department, including those related to alternative approaches to resolution of disputes involving intellectual property rights and other technology transfer matters.

(c) TECHNOLOGY TRANSFER RESPONSIBILITY.—Nothing in this section shall affect the technology transfer responsibilities of Federal employees under the Stevenson-Wydler Technology Innovation Act of 1980.

#### SEC. 189. SMALL BUSINESS ADVOCACY AND ASSISTANCE.

(a) SMALL BUSINESS ADVOCATE.—The Secretary shall require the Director of each National Laboratory, and may require the Director of a single-purpose research facility, to designate a small business advocate to—

(1) increase the participation of small business concerns, including socially and economically disadvantaged small business concerns, in procurement, collaborative research, technology licensing, and technology transfer activities conducted by the National Laboratory or single-purpose research facility;

(2) report to the Director of the National Laboratory or single-purpose research facility on the actual participation of small business concerns in procurement and collaborative research along with recommendations, if appropriate, on how to improve participation;

(3) make available to small business concerns training, mentoring, and clear, up-to-date information on how to participate in the procurement and collaborative research, including how to submit effective proposals, and information re-

lated to alternative approaches to resolution of disputes involving intellectual property rights and other technology transfer matters;

(4) increase the awareness inside the National Laboratory or single-purpose research facility of the capabilities and opportunities presented by small business concerns; and

(5) establish guidelines for the program under subsection (b) and report on the effectiveness of such program to the Director of the National Laboratory or single-purpose research facility.

(b) **ESTABLISHMENT OF SMALL BUSINESS ASSISTANCE PROGRAM.**—The Secretary shall require the Director of each National Laboratory, and may require the Director of a single-purpose research facility, to establish a program to provide small business concerns—

(1) assistance directed at making them more effective and efficient subcontractors or suppliers to the National Laboratory or single-purpose research facility; or

(2) general technical assistance, the cost of which shall not exceed \$10,000 per instance of assistance, to improve the small business concern's products or services.

(c) **USE OF FUNDS.**—None of the funds expended under subsection (b) may be used for direct grants to the small business concerns.

(d) **DEFINITIONS.**—In this section:

(1) **SMALL BUSINESS CONCERN.**—The term “small business concern” has the meaning given such term in section 3 of the Small Business Act (15 U.S.C. 632).

(2) **SOCIALLY AND ECONOMICALLY DISADVANTAGED SMALL BUSINESS CONCERNS.**—The term “socially and economically disadvantaged small business concerns” has the meaning given such term in section 8(a)(4) of the Small Business Act (15 U.S.C. 637(a)(4)).

**SEC. 190. MOBILITY OF SCIENTIFIC AND TECHNICAL PERSONNEL.**

Not later than 2 years after the date of enactment of this section, the Secretary shall transmit a report to the Congress identifying any policies or procedures of a contractor operating a National Laboratory or single-purpose research facility that create disincentives to the temporary transfer of scientific and technical personnel among the contractor-operated National Laboratories or contractor-operated single-purpose research facilities.

**SEC. 191. NATIONAL ACADEMY OF SCIENCES REPORT.**

Within 90 days after the date of enactment of this Act, the Secretary shall enter into an arrangement with the National Academy of Sciences for the Academy to—

(1) conduct studies on—

(A) the obstacles to accelerating the commercial application of energy technology; and

(B) the adequacy of Department policies and procedures for, and oversight of, technology transfer-related disputes between contractors of the Department and the private sector; and

(2) report to the Congress on recommendations developed as a result of the studies.

**SEC. 192. OUTREACH.**

The Secretary shall ensure that each program authorized by this title includes an outreach component to provide information, as appropriate, to manufacturers, consumers, engineers, architects, builders, energy service companies, institutions of higher education, facility planners and managers, State and local governments, and other entities.

**SEC. 193. LIMITS ON USE OF FUNDS.**

(a) **COMPETITIVE PROCEDURE REQUIREMENT.**—None of the funds authorized to be appropriated to the Secretary by this title may be used to award a management and operating contract for a nonmilitary energy laboratory of the Department unless such contract is competitively awarded or the Secretary grants, on a case-by-case basis, a waiver to allow for such a deviation. The Secretary may not delegate the authority to grant such a waiver.

(b) **CONGRESSIONAL NOTICE.**—At least 2 months before a contract award for which the Secretary intends to grant such a waiver, the Secretary shall submit to the Congress a report notifying the Congress of the waiver and setting forth the reasons for the waiver.

**SEC. 194. REPROGRAMMING.**

(a) **DISTRIBUTION REPORT.**—Not later than 60 days after the date of the enactment of an Act appropriating amounts authorized under this title, the Secretary shall transmit to the appropriate authorizing committees of the Congress a report ex-

plaining how such amounts will be distributed among the authorizations contained in this title.

(b) PROHIBITION.—(1) No amount identified under subsection (a) shall be reprogrammed if such reprogramming would result in an obligation which changes an individual distribution required to be reported under subsection (a) by more than 5 percent unless the Secretary has transmitted to the appropriate authorizing committees of the Congress a report described in subsection (c) and a period of 30 days has elapsed after such committees receive the report.

(2) In the computation of the 30-day period described in paragraph (1), there shall be excluded any day on which either House of Congress is not in session because of an adjournment of more than 3 days to a day certain.

(c) REPROGRAMMING REPORT.—A report referred to in subsection (b)(1) shall contain a full and complete statement of the action proposed to be taken and the facts and circumstances relied on in support of the proposed action.

**SEC. 195. CONSTRUCTION WITH OTHER LAWS.**

Except as otherwise provided in this title, the Secretary shall carry out the research, development, demonstration, and commercial application programs, projects, and activities authorized by this title in accordance with the applicable provisions of the Atomic Energy Act of 1954 (42 U.S.C. et seq.), the Federal Nonnuclear Research and Development Act of 1974 (42 U.S.C. 5901 et seq.), the Energy Policy Act of 1992 (42 U.S.C. 13201 et seq.), the Stevenson-Wydler Technology Innovation Act of 1980 (15 U.S.C. 3701 et seq.), chapter 18 of title 35, United States Code (commonly referred to as the Bayh-Dole Act), and any other Act under which the Secretary is authorized to carry out such activities.

**SEC. 196. UNIVERSITY COLLABORATION.**

Not later than 2 years after the date of enactment of this Act, the Secretary shall transmit to the Congress a report that examines the feasibility of promoting collaborations between large institutions of higher education and small institutions of higher education through grants, contracts, and cooperative agreements made by the Secretary for energy projects. The Secretary shall also consider providing incentives for the inclusion of small institutions of higher education, including minority-serving institutions, in energy research grants, contracts, and cooperative agreements.

**SEC. 197. FEDERAL LABORATORY EDUCATIONAL PARTNERS.**

(a) DISTRIBUTION OF ROYALTIES RECEIVED BY FEDERAL AGENCIES.—Section 14(a)(1)(B)(v) of the Stevenson-Wydler Technology Innovation Act of 1980 (15 U.S.C. 3710c(a)(1)(B)(v)), is amended to read as follows:

“(v) for scientific research and development and for educational assistance and other purposes consistent with the missions and objectives of the Department of Energy and the laboratory.”.

(b) COOPERATIVE RESEARCH AND DEVELOPMENT AGREEMENTS.—Section 12(b)(5)(C) of the Stevenson-Wydler Technology Innovation Act of 1980 (15 U.S.C. 3710a(b)(5)(C)) is amended to read as follows:

“(C) for scientific research and development and for educational assistance consistent with the missions and objectives of the Department of Energy and the laboratory.”.

**SEC. 198. INTERAGENCY COOPERATION.**

The Secretary shall enter into discussions with the Administrator of the National Aeronautics and Space Administration with the goal of reaching an interagency working agreement between the 2 agencies that would make the National Aeronautics and Space Administration's expertise in energy, gained from its existing and planned programs, more readily available to the relevant research, development, demonstration, and commercial applications programs of the Department. Technologies to be discussed should include the National Aeronautics and Space Administration's modeling, research, development, testing, and evaluation of new energy technologies, including solar, wind, fuel cells, and hydrogen storage and distribution.

## **TITLE II—DEPARTMENT OF ENERGY MANAGEMENT**

**SEC. 201. IMPROVED COORDINATION AND MANAGEMENT OF CIVILIAN SCIENCE AND TECHNOLOGY PROGRAMS.**

(a) RECONFIGURATION OF POSITION OF DIRECTOR OF THE OFFICE OF SCIENCE.—Section 209 of the Department of Energy Organization Act (41 U.S.C. 7139) is amended to read as follows:

## "OFFICE OF SCIENCE

"SEC. 209. (a) There shall be within the Department an Office of Science, to be headed by an Assistant Secretary of Science, who shall be appointed by the President, by and with the advice and consent of the Senate, and who shall be compensated at the rate provided for level IV of the Executive Schedule under section 5315 of title 5, United States Code.

"(b) The Assistant Secretary of Science shall be in addition to the Assistant Secretaries provided for under section 203 of this Act.

"(c) It shall be the duty and responsibility of the Assistant Secretary of Science to carry out the fundamental science and engineering research functions of the Department, including the responsibility for policy and management of such research, as well as other functions vested in the Secretary which he may assign to the Assistant Secretary."

(b) ADDITIONAL ASSISTANT SECRETARY POSITION TO ENABLE IMPROVED MANAGEMENT OF NUCLEAR ENERGY ISSUES.—(1) Section 203(a) of the Department of Energy Organization Act (42 U.S.C. 7133(a)) is amended by striking "There shall be in the Department six Assistant Secretaries" and inserting "Except as provided in section 209, there shall be in the Department seven Assistant Secretaries".

(2) It is the sense of the Congress that the leadership for departmental missions in nuclear energy should be at the Assistant Secretary level.

(c) TECHNICAL AND CONFORMING AMENDMENTS.—(1) Section 5315 of title 5, United States Code, is amended by—

(A) striking "Director, Office of Science, Department of Energy."; and

(B) striking "Assistant Secretaries of Energy (6)" and inserting "Assistant Secretaries of Energy (8)".

(2) The table of contents for the Department of Energy Organization Act (42 U.S.C. 7101 note) is amended—

(A) by striking "Section 209" and inserting "Sec. 209";

(B) by striking "213." and inserting "Sec. 213.";

(C) by striking "214." and inserting "Sec. 214.";

(D) by striking "215." and inserting "Sec. 215."; and

(E) by striking "216." and inserting "Sec. 216."

**SEC. 202. REPORT ON EQUAL EMPLOYMENT OPPORTUNITY PRACTICES.**

The Secretary shall transmit to the Congress a biennial report on the equal employment opportunity practices at the nonmilitary energy laboratories. Such report shall include—

(1) a thorough review of each nonmilitary energy laboratory contractor's equal employment opportunity policies;

(2) a statistical report on complaints and their disposition in the laboratories;

(3) the role equal employment opportunity practices play in selecting the contractor for each laboratory, and in establishing the fee that is paid to the contractor for each laboratory;

(4) a summary of disciplinary actions by either the Department or the relevant contractors for each laboratory; and

(5) a summary of efforts by the Department and the relevant contractors for each laboratory to attract women and minorities to the laboratories.

**SEC. 203. EXTERNAL REGULATION OF DEPARTMENT OF ENERGY.**

(a) ELIMINATION OF DEPARTMENT OF ENERGY AUTHORITY.—Effective 2 years after the date of enactment of this Act, the Department shall have no regulatory or enforcement authority with respect to nuclear safety and occupational safety and health responsibilities assumed by the Nuclear Regulatory Commission under subsection (b) or by the Occupational Safety and Health Administration under subsection (c) at any nonmilitary energy laboratory owned or operated by the Department.

(b) NUCLEAR REGULATORY COMMISSION AUTHORITY.—

(1) NUCLEAR SAFETY REGULATORY AND ENFORCEMENT RESPONSIBILITIES.—Effective 2 years after the date of enactment of this Act, the Nuclear Regulatory Commission shall assume the nuclear safety regulatory and enforcement responsibilities of the Department under the Atomic Energy Act of 1954 with regard to nonmilitary energy laboratories owned or operated by the Department.

(2) LICENSED ENTITIES.—For the purposes of carrying out at nonmilitary energy laboratories owned or operated by the Department regulatory and enforcement responsibilities described in paragraph (1), the Nuclear Regulatory Commission may regulate, through licensing, certification, or other appropriate means, the Department's contractors.

(3) DECOMMISSIONING.—A contractor operating a nonmilitary energy laboratory owned by the Department shall not be responsible for the costs of decom-

missioning that facility. No enforcement action may be taken against such contractor for any violation of Nuclear Regulatory Commission decommissioning requirements, if such violation is the result of a failure of the Department to authorize or fund decommissioning activities. The Nuclear Regulatory Commission and the Department shall, not later than 1 year after the date of enactment of this Act, enter into a memorandum of understanding establishing decommissioning procedures and requirements for nonmilitary energy laboratories owned or operated by the Department.

(4) ACCELERATORS.—Notwithstanding the provisions of the Atomic Energy Act of 1954 (42 U.S.C. 2011 et. seq.), effective 2 years after the date of enactment of this Act, the Nuclear Regulatory Commission shall have exclusive regulatory authority over accelerators, other electronic sources of radiation not assigned to the Commission as of the date of enactment of this Act, accelerator-produced radioisotopes, and naturally occurring radioactive materials at nonmilitary energy laboratories, consistent with the authorities granted the Nuclear Regulatory Commission in the Atomic Energy Act of 1954. Until such time as the Commission has completed a rulemaking for the foregoing equipment and radioisotopes, nonmilitary energy laboratories shall be required to meet the requirements stipulated in a license for the facility.

(5) ADMINISTRATION.—The responsibilities assumed by the Nuclear Regulatory Commission under this subsection shall be administered by the Nuclear Regulatory Commission, not by States.

(6) JUDICIAL REVIEW.—Section 189 b. of the Atomic Energy Act of 1954 (42 U.S.C. 2239(b)) is amended by adding the following paragraph after paragraph (4):

“(5) Any final order or regulation of the Commission establishing standards to govern nonmilitary energy laboratories owned or operated by the Department of Energy that is issued to implement the Commission’s responsibilities under section 202 of the Energy Research, Development, Demonstration, and Commercial Application Act of 2003, and any final determination of the Commission relating to whether a nonmilitary energy laboratory owned or operated by the Department is in compliance with such standards and all applicable Commission regulations or orders.”.

(7) EMPLOYEE PROTECTION.—Any Department contractor operating a nonmilitary energy laboratory that is regulated by the Nuclear Regulatory Commission under this section shall be subject to section 211 of the Energy Reorganization Act of 1974 (42 U.S.C. 5851) to the same extent as any other employer subject to such section 211.

(8) CONFLICT OF INTEREST.—Section 170A of the Atomic Energy Act of 1954 (42 U.S.C. 2210a) applies to contracts, agreements, or other arrangements of the Nuclear Regulatory Commission proposed or entered into pursuant to its responsibilities assumed under this subsection.

(c) OCCUPATIONAL SAFETY AND HEALTH.—

(1) OSHA JURISDICTION.—Notwithstanding section 4(b)(1) of the Occupational Safety and Health Act of 1970 (29 U.S.C. 653(b)(1)), effective 2 years after the date of enactment of this Act, the Occupational Safety and Health Administration shall assume the exclusive regulatory and enforcement responsibilities of the Department relating to matters covered by the Occupational Safety and Health Act of 1970 with regard to all nonmilitary energy laboratories owned or operated by the Department, except as provided in paragraph (2). The responsibilities assumed by the Occupational Safety and Health Administration under this subsection shall be administered by the Occupational Safety and Health Administration, not by States. Any Department contractor operating such a laboratory shall, with respect to matters relating to occupational safety and health, be considered to be an employer for purposes of the Occupational Safety and Health Act of 1970.

(2) REGULATION OF HAZARDS CONTAINING RADIOLOGICAL AND NON-RADIOLOGICAL COMPONENT.—If a hazard at a nonmilitary energy laboratory owned or operated by the Department presents a risk of occupational exposure and contains both a radiological and non-radiological component, the Occupational Safety and Health Administration and the Nuclear Regulatory Commission shall, effective 2 years after the date of enactment of this Act, share regulatory and enforcement responsibilities with respect to the hazard in accordance with the memorandum of understanding entered into pursuant to subsection (d).

(d) MEMORANDUM OF UNDERSTANDING.—The Nuclear Regulatory Commission and the Occupational Safety and Health Administration shall, not later than 1 year after the date of enactment of this Act, enter into and transmit to the Congress a memorandum of understanding to govern the exercise of their respective authorities over

nuclear safety and occupational safety and health at nonmilitary energy laboratories owned or operated by the Department.

(e) CIVIL PENALTIES.—The Department's contractor operating a nonmilitary energy laboratory owned or operated by the Department shall not be liable for civil penalties under the Atomic Energy Act of 1954 or the Occupational Safety and Health Act of 1970 for any actions taken before the date of transfer of regulatory authority under this section, pursuant to the instructions of a Federal agency in preparation for the transfer of regulatory and enforcement responsibilities required by this section.

(f) INDEMNIFICATION.—The Secretary shall continue to indemnify nonmilitary energy laboratories owned or operated by the Department in accordance with the provisions of section 170 d. of the Atomic Energy Act of 1954.

(g) DEPARTMENT OF ENERGY REPORTING REQUIREMENT.—Not later than 18 months after the date of enactment of this Act, the Secretary shall transmit to the Congress a plan for the termination of the Department's regulatory and enforcement responsibilities for nonmilitary energy laboratories owned or operated by the Department required by this section. The report shall include—

(1) a detailed transition plan, drafted in coordination with the Nuclear Regulatory Commission and the Occupational Safety and Health Administration, giving the schedule for termination of self-regulation authority as outlined in subsection (a), including the activities to be coordinated with the Nuclear Regulatory Commission and the Occupational Safety and Health Administration;

(2) a description of any issues remaining to be resolved with the Nuclear Regulatory Commission, the Occupational Safety and Health Administration, or other external regulators, and a timetable for resolving such issues by the authority transfer date established under this section; and

(3) an estimate of—

(A) the annual cost of administering and implementing self-regulation of the nuclear safety and occupational safety and health responsibilities described in subsections (b) and (c) at nonmilitary energy laboratories owned or operated by the Department;

(B) the number of Federal and contractor employees administering and implementing such self-regulation; and

(C) the extent and schedule by which the Department and the staffs at its nonmilitary energy laboratories will be reduced as a result of implementation of this section.

(h) GENERAL ACCOUNTING OFFICE REPORTING REQUIREMENT.—The Comptroller General of the United States shall periodically report to the Congress on the progress made in implementing this section. The Comptroller General shall provide a report not later than 20 months after the date of enactment of this Act on the Department's transition plan, and not later than 26 months after the date of enactment of this Act on the implementation of Nuclear Regulatory Commission and Occupational Safety and Health Administration regulations in the nonmilitary energy laboratories.

## TITLE III—CLEAN SCHOOL BUSES

### SEC. 301. ESTABLISHMENT OF PILOT PROGRAM.

(a) ESTABLISHMENT.—The Secretary of Energy, in consultation with the Administrator of the Environmental Protection Agency, shall establish a pilot program for awarding grants on a competitive basis to eligible entities for the demonstration and commercial application of alternative fuel school buses and ultra-low sulfur diesel school buses.

(b) REQUIREMENTS.—Not later than 3 months after the date of the enactment of this Act, the Secretary shall establish and publish in the Federal register grant requirements on eligibility for assistance, and on implementation of the program established under subsection (a), including certification requirements to ensure compliance with this title.

(c) SOLICITATION.—Not later than 6 months after the date of the enactment of this Act, the Secretary shall solicit proposals for grants under this section.

(d) ELIGIBLE RECIPIENTS.—A grant shall be awarded under this section only—

(1) to a local or State governmental entity responsible for providing school bus service to one or more public school systems or responsible for the purchase of school buses; or

(2) to a contracting entity that provides school bus service to one or more public school systems, if the grant application is submitted jointly with the school system or systems which the buses will serve.

(e) TYPES OF GRANTS.—

- (1) IN GENERAL.—Grants under this section shall be for the demonstration and commercial application of technologies to facilitate the use of alternative fuel school buses and ultra-low sulfur diesel school buses in lieu of buses manufactured before model year 1977 and diesel-powered buses manufactured before model year 1991.
- (2) NO ECONOMIC BENEFIT.—Other than the receipt of the grant, a recipient of a grant under this section may not receive any economic benefit in connection with the receipt of the grant.
- (3) PRIORITY OF GRANT APPLICATIONS.—The Secretary shall give priority to awarding grants to applicants who can demonstrate the use of alternative fuel buses and ultra-low sulfur diesel school buses in lieu of buses manufactured before model year 1977.
- (f) CONDITIONS OF GRANT.—A grant provided under this section shall include the following conditions:
- (1) All buses acquired with funds provided under the grant shall be operated as part of the school bus fleet for which the grant was made for a minimum of 5 years.
  - (2) Funds provided under the grant may only be used—
    - (A) to pay the cost, except as provided in paragraph (3), of new alternative fuel school buses or ultra-low sulfur diesel school buses, including State taxes and contract fees; and
    - (B) to provide—
      - (i) up to 10 percent of the price of the alternative fuel buses acquired, for necessary alternative fuel infrastructure if the infrastructure will only be available to the grant recipient; and
      - (ii) up to 15 percent of the price of the alternative fuel buses acquired, for necessary alternative fuel infrastructure if the infrastructure will be available to the grant recipient and to other bus fleets.
  - (3) The grant recipient shall be required to provide at least the lesser of 15 percent of the total cost of each bus received or \$15,000 per bus.
  - (4) In the case of a grant recipient receiving a grant to demonstrate ultra-low sulfur diesel school buses, the grant recipient shall be required to provide documentation to the satisfaction of the Secretary that diesel fuel containing sulfur at not more than 15 parts per million is available for carrying out the purposes of the grant, and a commitment by the applicant to use such fuel in carrying out the purposes of the grant.
- (g) BUSES.—Funding under a grant made under this section may be used to demonstrate the use only of new alternative fuel school buses or ultra-low sulfur diesel school buses—
- (1) with a gross vehicle weight of greater than 14,000 pounds;
  - (2) that are powered by a heavy duty engine;
  - (3) that, in the case of alternative fuel school buses manufactured in model years 2003 through 2006, emit not more than 1.8 grams per brake horsepower-hour of nonmethane hydrocarbons and oxides of nitrogen and .01 grams per brake horsepower-hour of particulate matter; and
  - (4) that, in the case of ultra-low sulfur diesel school buses, emit not more than—
    - (A) for buses manufactured in model year 2003, 3.0 grams per brake horsepower-hour of oxides of nitrogen and .01 grams per brake horsepower-hour of particulate matter; and
    - (B) for buses manufactured in model years 2004 through 2006, 2.5 grams per brake horsepower-hour of nonmethane hydrocarbons and oxides of nitrogen and .01 grams per brake horsepower-hour of particulate matter,
 except that under no circumstances shall buses be acquired under this section that emit nonmethane hydrocarbons, oxides of nitrogen, or particulate matter at a rate greater than the best performing technology of the same class of ultra-low sulfur diesel school buses commercially available at the time the grant is made.
- (h) DEPLOYMENT AND DISTRIBUTION.—The Secretary shall seek to the maximum extent practicable to achieve nationwide deployment of alternative fuel school buses and ultra-low sulfur diesel school buses through the program under this section, and shall ensure a broad geographic distribution of grant awards, with a goal of no State receiving more than 10 percent of the grant funding made available under this section for a fiscal year.
- (i) LIMIT ON FUNDING.—The Secretary shall provide not less than 20 percent and not more than 25 percent of the grant funding made available under this section for any fiscal year for the acquisition of ultra-low sulfur diesel school buses.
- (j) ANNUAL REPORT.—Not later than January 31 of each year, the Secretary of Energy shall provide a report evaluating implementation of the program under this

title to the Congress. Such report shall include the total number of grant applications received, the number and types of alternative fuel buses and ultra-low sulfur diesel school buses requested in grant applications, a list of grants awarded and the criteria used to select the grant recipients, certified engine emission levels of all buses purchased under the program, and any other information the Secretary considers appropriate.

(k) DEFINITIONS.—For purposes of this section—

(1) the term “alternative fuel school bus” means a bus powered substantially by electricity (including electricity supplied by a fuel cell), or by liquefied natural gas, compressed natural gas, liquefied petroleum gas, hydrogen, propane, or methanol or ethanol at no less than 85 percent by volume; and

(2) the term “ultra-low sulfur diesel school bus” means a school bus powered by diesel fuel which contains sulfur at not more than 15 parts per million.

**SEC. 302. FUEL CELL BUS DEVELOPMENT AND DEMONSTRATION PROGRAM.**

(a) ESTABLISHMENT OF PROGRAM.—The Secretary shall establish a program for entering into cooperative agreements with private sector fuel cell bus developers for the development of fuel cell-powered school buses, and subsequently with not less than 2 units of local government using natural gas-powered school buses and such private sector fuel cell bus developers to demonstrate the use of fuel cell-powered school buses.

(b) COST SHARING.—The non-Federal contribution for activities funded under this section shall be not less than—

(1) 20 percent for fuel infrastructure development activities; and

(2) 50 percent for demonstration activities and for development activities not described in paragraph (1).

(c) FUNDING.—No more than \$25,000,000 of the amounts authorized under section 304 may be used for carrying out this section for the period encompassing fiscal years 2004 through 2006.

(d) REPORTS TO CONGRESS.—Not later than 3 years after the date of the enactment of this Act, and not later than October 1, 2006, the Secretary shall transmit to the Congress a report that—

(1) evaluates the process of converting natural gas infrastructure to accommodate fuel cell-powered school buses; and

(2) assesses the results of the development and demonstration program under this section.

**SEC. 303. DIESEL RETROFIT PROGRAM.**

(a) ESTABLISHMENT.—The Administrator of the Environmental Protection Agency and the Secretary shall establish a pilot program for awarding grants on a competitive basis to eligible recipients for the demonstration and commercial application of retrofit technologies for diesel school buses.

(b) ELIGIBLE RECIPIENTS.—A grant shall be awarded under this section only—

(1) to a local or State governmental entity responsible for providing school bus service to one or more public school systems; or

(2) to a contracting entity that provides school bus service to one or more public school systems, if the grant application is submitted jointly with the school system or systems which the buses will serve.

(c) CONDITIONS OF GRANT.—A grant provided under this section may be used only to demonstrate the use of retrofit emissions-control technology on diesel buses that—

(1) operate on ultra-low sulfur diesel fuel; and

(2) were manufactured in model year 1991 or later.

(d) VERIFICATION.—Not later than 3 months after the date of enactment of this Act, the Administrator shall publish in the Federal Register procedures to verify—

(1) the retrofit emissions-control technology to be demonstrated; and

(2) that buses on which retrofit emissions-control technology are to be demonstrated will operate on diesel fuel containing not more than 15 parts per million of sulfur.

**SEC. 304. AUTHORIZATION OF APPROPRIATIONS.**

(a) SCHOOL BUS GRANTS.—There are authorized to be appropriated to the Secretary for carrying out this title, to remain available until expended—

(1) \$90,000,000 for fiscal year 2004;

(2) \$100,000,000 for fiscal year 2005; and

(3) \$110,000,000 for fiscal year 2006.

(b) RETROFIT GRANTS.—There are authorized to be appropriated to the Administrator of the Environmental Protection Agency and the Secretary such sums as may be necessary for carrying out section 303.

## TITLE IV—ALTERNATIVE FUELED AND ADVANCED VEHICLES

### SEC. 401. DEFINITIONS.

For the purposes of this title, the following definitions apply:

(1) **ALTERNATIVE FUELED VEHICLE.**—The term “alternative fueled vehicle” means a vehicle propelled solely on an alternative fuel as defined in section 301 of the Energy Policy Act (42 U.S.C. 13211), except the term does not include any vehicle that the Secretary determines, by rule, does not yield substantial environmental benefits over a vehicle operating solely on gasoline or diesel derived from fossil fuels.

(2) **FUEL CELL VEHICLE.**—The term “fuel cell vehicle” means a vehicle propelled by an electric motor powered by a fuel cell system that converts chemical energy into electricity by combining oxygen (from air) with hydrogen fuel that is stored on the vehicle or is produced onboard by reformation of a hydrocarbon fuel. Such fuel cell system may or may not include the use of auxiliary energy storage systems to enhance vehicle performance.

(3) **HYBRID VEHICLE.**—The term “hybrid vehicle” means a medium or heavy duty vehicle that is more efficient than its non-hybrid counterpart and that draws propulsion energy from both an internal combustion engine using any combustible fuel and an onboard energy storage device.

(4) **NEIGHBORHOOD ELECTRIC VEHICLE.**—The term “neighborhood electric vehicle” means a motor vehicle capable of traveling at speeds of 25 miles per hour that is—

(A) a low-speed vehicle, as such term is defined in section 571.3(b) of title 49, Code of Federal Regulations;

(B) a zero-emission vehicle, as such term is defined in section 86.1702–99 of title 40, Code of Federal Regulations; and

(C) otherwise lawful to use on local streets.

(5) **PILOT PROGRAM.**—The term “pilot program” means the competitive grant program established under section 402.

(6) **ULTRA-LOW SULFUR DIESEL VEHICLE.**—The term “ultra-low sulfur diesel vehicle” means a vehicle manufactured in model years 2003 through 2006 powered by a heavy-duty diesel engine that—

(A) is fueled by diesel fuel which contains sulfur at not more than 15 parts per million; and

(B) emits not more than the lesser of—

(i) for vehicles manufactured in—

(I) model year 2003, 3.0 grams per brake horsepower-hour of oxides of nitrogen and .01 grams per brake horsepower-hour of particulate matter; and

(II) model years 2004 through 2006, 2.5 grams per brake horsepower-hour of nonmethane hydrocarbons and oxides of nitrogen and .01 grams per brake horsepower-hour of particulate matter; or

(ii) the emissions of nonmethane hydrocarbons, oxides of nitrogen, and particulate matter of the best performing technology of ultra-low sulfur diesel vehicles of the same class and application that are commercially available.

### SEC. 402. PILOT PROGRAM.

(a) **ESTABLISHMENT.**—The Secretary shall establish a competitive grant pilot program, to be administered through the Clean Cities Program of the Department of Energy, to provide not more than 15 geographically dispersed project grants to State governments, local governments, or metropolitan transportation authorities to carry out a project or projects for the purposes described in subsection (b).

(b) **GRANT PURPOSES.**—Grants under this section may be used for the following purposes:

(1) The acquisition of alternative fueled vehicles or fuel cell vehicles, including—

(A) passenger vehicles including neighborhood electric vehicles; and

(B) motorized two-wheel bicycles, scooters, or other vehicles for use by law enforcement personnel or other State or local government or metropolitan transportation authority employees.

(2) The acquisition of alternative fueled vehicles, hybrid vehicles, or fuel cell vehicles, including—

(A) buses used for public transportation or transportation to and from schools;

(B) delivery vehicles for goods or services; and

- (C) ground support vehicles at public airports, including vehicles to carry baggage or push airplanes away from terminal gates.
- (3) The acquisition of ultra-low sulfur diesel vehicles.
- (4) Infrastructure necessary to directly support an alternative fueled vehicle or fuel cell vehicle project funded by the grant, including fueling and other support equipment.
- (5) Operation and maintenance of vehicles, infrastructure, and equipment acquired as part of a project funded by the grant.
- (c) APPLICATIONS.—
  - (1) REQUIREMENTS.—The Secretary shall issue requirements for applying for grants under the pilot program. At a minimum, the Secretary shall require that applications be submitted by the head of a State or local government or a metropolitan transportation authority, or any combination thereof, and a registered participant in the Clean Cities Program of the Department of Energy, and shall include—
    - (A) at least one project to enable passengers or goods to be transferred directly from vehicles acquired under this section to a local, regional, or national transportation system;
    - (B) a description of the projects proposed in the application, including how they meet the requirements of this title;
    - (C) an estimate of the ridership or degree of use of the projects proposed in the application;
    - (D) an estimate of the air pollution emissions reduced and fossil fuel displaced as a result of the projects proposed in the application, and a plan to collect and disseminate environmental data, related to the projects to be funded under the grant, over the life of the projects;
    - (E) a description of how the projects proposed in the application will be sustainable without Federal assistance after the completion of the term of the grant;
    - (F) a complete description of the costs of each project proposed in the application, including acquisition, construction, operation, and maintenance costs over the expected life of the project;
    - (G) a description of which costs of the projects proposed in the application will be supported by Federal assistance under this title; and
    - (H) documentation to the satisfaction of the Secretary that diesel fuel containing sulfur at not more than 15 parts per million is available for carrying out the projects, and a commitment by the applicant to use such fuel in carrying out the projects.
  - (2) PARTNERS.—An applicant under paragraph (1) may carry out projects under the pilot program in partnership with public and private entities.
  - (d) SELECTION CRITERIA.—In evaluating applications under the pilot program, the Secretary shall consider each applicant's previous experience with similar projects and shall give priority consideration to applications that—
    - (1) are most likely to maximize protection of the environment;
    - (2) demonstrate the greatest commitment on the part of the applicant to ensure funding for the proposed projects and the greatest likelihood that each project proposed in the application will be maintained or expanded after Federal assistance under this title is completed; and
    - (3) exceed the minimum requirements of subsection (c)(1)(A).
  - (e) PILOT PROJECT REQUIREMENTS.—
    - (1) MAXIMUM AMOUNT.—The Secretary shall not provide more than \$20,000,000 in Federal assistance under the pilot program to any applicant.
    - (2) COST SHARING.—The Secretary shall not provide more than 50 percent of the cost, incurred during the period of the grant, of any project under the pilot program.
    - (3) MAXIMUM PERIOD OF GRANTS.—The Secretary shall not fund any applicant under the pilot program for more than 5 years.
    - (4) DEPLOYMENT AND DISTRIBUTION.—The Secretary shall seek to the maximum extent practicable to ensure a broad geographic distribution of project sites.
    - (5) TRANSFER OF INFORMATION AND KNOWLEDGE.—The Secretary shall establish mechanisms to ensure that the information and knowledge gained by participants in the pilot program are transferred among the pilot program participants and to other interested parties, including other applicants that submitted applications.
  - (f) SCHEDULE.—
    - (1) PUBLICATION.—Not later than 3 months after the date of the enactment of this Act, the Secretary shall publish in the Federal Register, Commerce Business Daily, and elsewhere as appropriate, a request for applications to under-

take projects under the pilot program. Applications shall be due within 6 months of the publication of the notice.

(2) SELECTION.—Not later than 6 months after the date by which applications for grants are due, the Secretary shall select by competitive, peer review all applications for projects to be awarded a grant under the pilot program.

(g) LIMIT ON FUNDING.—The Secretary shall provide not less than 20 percent and not more than 25 percent of the grant funding made available under this section for the acquisition of ultra-low sulfur diesel vehicles.

**SEC. 403. REPORTS TO CONGRESS.**

(a) INITIAL REPORT.—Not later than 2 months after the date grants are awarded under the pilot program, the Secretary shall transmit to the Congress a report containing—

(1) an identification of the grant recipients and a description of the projects to be funded;

(2) an identification of other applicants that submitted applications for the pilot program; and

(3) a description of the mechanisms used by the Secretary to ensure that the information and knowledge gained by participants in the pilot program are transferred among the pilot program participants and to other interested parties, including other applicants that submitted applications.

(b) EVALUATION.—Not later than 3 years after the date of the enactment of this Act, and annually thereafter until the pilot program ends, the Secretary shall transmit to the Congress a report containing an evaluation of the effectiveness of the pilot program, including an assessment of the benefits to the environment derived from the projects included in the pilot program as well as an estimate of the potential benefits to the environment to be derived from widespread application of alternative fueled vehicles and ultra-low sulfur diesel vehicles.

**SEC. 404. FUEL CELL TRANSIT BUS DEMONSTRATION.**

The Secretary shall establish a transit bus demonstration program to make competitive, merit-based awards for five-year projects to demonstrate not more than 12 fuel cell transit buses (and necessary infrastructure) in three geographically dispersed localities. In selecting projects under this section, the Secretary shall give preference to projects that are most likely to mitigate congestion and improve air quality.

**SEC. 405. AUTHORIZATION OF APPROPRIATIONS.**

There are authorized to be appropriated to the Secretary \$200,000,000 to carry out this title, to remain available until expended.

## **TITLE V—CLEAN COAL**

**SEC. 501. AUTHORIZATION OF APPROPRIATIONS.**

(a) CLEAN COAL POWER INITIATIVE.—Except as provided in subsection (b), there are authorized to be appropriated to the Secretary to carry out the activities authorized by this title \$200,000,000 for each of the fiscal years 2003 through 2011, to remain available until expended.

(b) LIMIT ON USE OF FUNDS.—Notwithstanding subsection (a), no funds may be used to carry out the activities authorized by this title after September 30, 2005, unless the Secretary has transmitted to the Committee on Energy and Commerce and the Committee on Science of the House of Representatives, and to the Senate, the report required by this subsection and one month has elapsed since that transmission. The report shall include, with respect to subsection (a), a 10-year plan containing—

(1) a detailed assessment of whether the aggregate funding levels provided under subsection (a) are the appropriate funding levels for that program;

(2) a detailed description of how proposals will be solicited and evaluated, including a list of all activities expected to be undertaken;

(3) a detailed list of technical milestones for each coal and related technology that will be pursued; and

(4) a detailed description of how the program will avoid problems enumerated in General Accounting Office reports on the Clean Coal Technology Program, including problems that have resulted in unspent funds and projects that failed either financially or scientifically.

(c) APPLICABILITY.—Subsection (b) shall not apply to any project begun before September 30, 2005.

**SEC. 502. PROJECT CRITERIA.**

(a) **IN GENERAL.**—The Secretary shall not provide funding under this title for any project that does not advance efficiency, environmental performance, and cost competitiveness well beyond the level of technologies that are in commercial service or have been demonstrated on a scale that the Secretary determines is sufficient to demonstrate that commercial service is viable as of the date of the enactment of this Act.

(b) **TECHNICAL CRITERIA FOR CLEAN COAL POWER INITIATIVE.**—

(1) **GASIFICATION.**—(A) In allocating the funds made available under section 501(a), the Secretary shall ensure that at least 80 percent of the funds are used only for projects on coal-based gasification technologies, including gasification combined cycle, gasification fuel cells, gasification coproduction, and hybrid gasification/combustion.

(B) The Secretary shall set technical milestones specifying emissions levels that coal gasification projects must be designed to and reasonably expected to achieve. The milestones shall get more restrictive through the life of the program. The milestones shall be designed to achieve by 2020 coal gasification projects able—

- (i) to remove 99 percent of sulfur dioxide;
- (ii) to emit no more than .05 lbs of NOx per million BTU;
- (iii) to achieve substantial reductions in mercury emissions; and
- (iv) to achieve a thermal efficiency of—
  - (I) 60 percent for coal of more than 9,000 Btu;
  - (II) 59 percent for coal of 7,000 to 9,000 Btu; and
  - (III) 50 percent for coal of less than 7,000 Btu.

(C) Beginning in fiscal year 2009, the Secretary may use funds under this paragraph for a project that does not meet the criteria described in subparagraph (A), but only if—

- (i) the Secretary finds that the project is likely to result in greater emissions reductions than would a project funded pursuant to subparagraph (A);
- (ii) the Secretary finds that the project would permit (but not necessarily include) the activities described in paragraph (5); and
- (iii) the Secretary notifies the Congress of the project at the time when it is approved.

(2) **OTHER PROJECTS.**—For projects not described in paragraph (1), the Secretary shall set technical milestones specifying emissions levels that the projects must be designed to and reasonably expected to achieve. The milestones shall get more restrictive through the life of the program. The milestones shall be designed to achieve by 2010 projects able—

- (A) to remove 97 percent of sulfur dioxide;
- (B) to emit no more than .08 lbs of NOx per million BTU;
- (C) to achieve substantial reductions in mercury emissions; and
- (D) to achieve a thermal efficiency of—
  - (i) 45 percent for coal of more than 9,000 Btu;
  - (ii) 44 percent for coal of 7,000 to 9,000 Btu; and
  - (iii) 40 percent for coal of less than 7,000 Btu.

(3) **CONSULTATION.**—Before setting the technical milestones under paragraphs (1)(B) and (2), the Secretary shall consult with the Administrator of the Environmental Protection Agency and interested entities, including coal producers, industries using coal, organizations to promote coal or advanced coal technologies, environmental organizations, and organizations representing workers.

(4) **EXISTING UNITS.**—In the case of projects at existing units, in lieu of the thermal efficiency requirements set forth in paragraph (1)(B)(iv) and (2)(D), the projects shall be designed to achieve an overall thermal design efficiency improvement compared to the efficiency of the unit as operated, of not less than—

- (A) 7 percent for coal of more than 9,000 Btu;
- (B) 6 percent for coal of 7,000 to 9,000 Btu; or
- (C) 4 percent for coal of less than 7,000 Btu.

(5) **PERMITTED USES.**—In allocating funds made available under section 501, the Secretary may fund projects that include, as part of the project, the separation and capture of carbon dioxide.

(c) **FINANCIAL CRITERIA.**—The Secretary shall not provide a funding award under this title unless the recipient has documented to the satisfaction of the Secretary that—

- (1) the award recipient is financially viable without the receipt of additional Federal funding;
- (2) the recipient will provide sufficient information to the Secretary for the Secretary to ensure that the award funds are spent efficiently and effectively; and

(3) a market exists for the technology being demonstrated or applied, as evidenced by statements of interest in writing from potential purchasers of the technology.

(d) **FINANCIAL ASSISTANCE.**—The Secretary shall provide financial assistance to projects that meet the requirements of subsections (a), (b), and (c) and are likely to—

(1) achieve overall cost reductions in the utilization of coal to generate useful forms of energy;

(2) improve the competitiveness of coal among various forms of energy in order to maintain a diversity of fuel choices in the United States to meet electricity generation requirements; and

(3) demonstrate methods and equipment that are applicable to 25 percent of the electricity generating facilities that use coal as the primary feedstock as of the date of the enactment of this Act.

(e) **FEDERAL SHARE.**—The Federal share of the cost of a coal or related technology project funded by the Secretary shall not exceed 50 percent.

(f) **APPLICABILITY.**—No technology, or level of emission reduction, shall be treated as adequately demonstrated for purposes of section 111 of the Clean Air Act, achievable for purposes of section 169 of that Act, or achievable in practice for purposes of section 171 of that Act solely by reason of the use of such technology, or the achievement of such emission reduction, by one or more facilities receiving assistance under this title.

**SEC. 503. REPORT.**

Not later than 1 year after the date of the enactment of this Act, and once every 2 years thereafter through 2011, the Secretary, in consultation with other appropriate Federal agencies, shall transmit to the Committee on Energy and Commerce and the Committee on Science of the House of Representatives, and to the Senate, a report describing—

(1) the technical milestones set forth in section 502 and how those milestones ensure progress toward meeting the requirements of subsections (b)(1)(B) and (b)(2) of section 502; and

(2) the status of projects funded under this title.

**SEC. 504. CLEAN COAL CENTERS OF EXCELLENCE.**

As part of the program authorized in section 501, the Secretary shall award competitive, merit-based grants to universities for the establishment of Centers of Excellence for Energy Systems of the Future. The Secretary shall provide grants to universities that can show the greatest potential for advancing new clean coal technologies.

## II. PURPOSE OF THE BILL

The purpose of H.R. 238, the Energy Research, Development, Demonstration, and Commercial Application Act of 2003, is to authorize appropriations for scientific and energy research, development, and demonstration (RD&D), and commercial application of energy technology programs, projects, and activities of the Department of Energy (Department or DOE), and for other purposes.

## III. BACKGROUND AND NEED FOR LEGISLATION

Affordable energy is essential to the Nation's continued prosperity. Volatile world oil markets, along with soaring natural gas and electricity prices, have replaced the relatively low energy prices enjoyed over most of the past two decades. In addition, there are increasing concerns about the environmental impacts of energy use. Consequently, energy is again on the front burner of the Nation's agenda.

The Committee on Science has a significant role in the legislative implementation of energy policy. Under rule X, clause 1(n)(1) of the Rules of the House, the Committee on Science has jurisdiction over "all bills, resolutions, and other matters relating to \* \* \* [all] energy research, development, and demonstrations, and projects therefor, \* \* \*". Similarly, the Committee has jurisdiction over en-

vironmental research and development (R&D) under rule X, clause 1(n)(4); over the commercial application of energy technology under rule X, clause 1(n)(6); and over scientific RD&D under rule X, clause 1(n)(14).

H.R. 238 focuses on DOE's support of major energy RD&D and commercial application activities, including those related to solar and renewable energy, energy efficiency, fossil energy, and nuclear and fusion energy. DOE also is a major funding source for basic research in the physical sciences.

DOE's general authority lies in several statutes—including the Atomic Energy Act of 1954 (P.L. 83-703), the Energy Reorganization Act of 1974 (P.L. 93-438), the Federal Nonnuclear Energy Research and Development Act of 1974 (P.L. 93-577), and the Department of Energy Organization Act (P.L. 95-91), which established DOE in the Executive Branch on October 1, 1977 as a cabinet-level agency. Beyond this general authority, statutes such as the Energy Policy Act of 1992 (P.L. 102-486) authorize numerous specific RD&D and commercial application activities. However, with two exceptions—methane hydrate R&D and Renewable Indian Energy Resources—none of the Department's existing civilian programs has specific fiscal authorizations for fiscal year 2004 and beyond. As a consequence, there is a need for a comprehensive authorization bill to provide guidance and direction to the Department that will preserve and strengthen the Nation's energy future and science base.

H.R. 238 as introduced is virtually identical to the provisions related to DOE's science and technology programs that were negotiated in the conference conducted in the 107th Congress in connection with H.R. 4, the Securing America's Future Energy Act of 2001. These negotiations were conducted by conferees and staff from the Committee on Science of the House of Representatives and the Committee on Energy and Natural Resources of the Senate, with the participation of the Committee on Energy and Commerce of the House of Representatives, which managed the bill.

H.R. 4 was omnibus energy legislation intended “[t]o enhance energy conservation, research and development and to provide for security and diversity in the energy supply for the American people, and for other purposes.” The Science Committee developed the legislative provisions in Division B, relating to energy RD&D. It also developed the provisions in Division E, relating to clean coal technology, in conjunction with the Committee on Energy and Commerce. Division B was taken from the text of H.R. 2460, the Comprehensive Energy Research and Technology Act of 2001, introduced by Science Committee Chairman Sherwood Boehlert (NY-23) on July 11, 2001. H.R. 2460 was based on information gathered at a series of hearings by the Committee on Science and on the recommendations of the Administration's National Energy Policy Development Group, published in May, 2001. The bill was referred solely to the Committee on Science, which marked up the bill on July 18, 2001 and reported the bill to the full House on July 31, 2001 (H. Rept. 107-177). Division E, relating to Federal clean coal technology program authorizations, also originated as the text of H.R. 2460, with changes negotiated with the Committee on Energy and Commerce.

H.R. 4 was introduced in the House on July 27, 2001. It was referred to the Committee on Energy and Commerce and, in addition, to the Committees on Science, Ways and Means, Resources, Education and the Workforce, Transportation and Infrastructure, the Budget, and Financial Services. The Science Committee discharged the bill on July 31, 2001, on which date the Committee on Rules filed H. Rept. 107-178 on H. Res. 216, providing for consideration of H.R. 4.

On August 2, 2001, the House passed H.R. 4, as amended, by the Yeas and Nays: 240-189 (Roll Call No. 320).

On April 25, 2002, the Senate passed H.R. 4, by the Yeas and Nays: 88-11 (Roll Call No. 94) after striking all after the enacting clause and inserting the text of S. 517, the Senate companion measure, as amended. The Senate Amendment contained several titles and provisions falling within the jurisdiction of the Committee on Science, including provisions related to energy research, development, demonstration and commercial application of energy technology (Sections 513-516, 770-772, 807-809, 814-816, 824, 832, Titles XII, Title XIV, Sections 1502, 1504-1505, Title XVI and Sections 1801-1805), indemnification of nuclear energy programs (Sections 501-507, and 509), and global climate change policy and climate science and technology (Sections 1001-1022 and Titles XI and XIII).

On May 1, 2002, the Senate Majority Leader appointed Mr. Bingaman, Mr. Hollings, Mr. Baucus, Mr. Kerry, Mr. Rockefeller, Mr. Breaux, Mr. Reid (NV), Mr. Jeffords, Mr. Lieberman, Mr. Murkowski, Mr. Domenici, Mr. Grassley, Mr. Nickles, Mr. Lott, Mr. Craig, Mr. Campbell and Mr. Thomas to the Committee on Conference on H.R. 4.

The House disagreed with the Senate amendment to H.R. 4 and agreed to a conference, ultimately naming 48 conferees from the House. From the Committee on Science, the Speaker appointed Mr. Boehlert, Mr. Bartlett (MD), and Mr. Hall (TX), provided that Mr. Costello be appointed in lieu of Mr. Hall for consideration of Division E and Ms. Woolsey be appointed in lieu of Mr. Hall for consideration of sections 2001-2178 and 2201-2261 of Division B of the House bill and modifications committed to conference.

The Conferees met on June 27, July 25, September 12, 19, 25 and 26, and October 2 and 3, of 2002 and reached agreement on a number of key provisions in the Conference, including provisions related to Clean Coal RD&D. In addition, in discussions on the remainder of the bill's provisions relating to energy RD&D and the commercial application of energy technology, conferees reached consensus on the overwhelming majority of issues, with the House and Senate exchanging offers that were identical on all but a few issues. However, the Conferees were unable to resolve differences on the remainder of the bill and the legislation died with the adjournment of the 107th Congress.

H.R. 238, as introduced, reflects the final House position on energy science and technology issues in the unconcluded conference on H.R. 4. As such, H.R. 238 represents, in many instances, compromise positions negotiated between the House and Senate aimed at developing a balanced energy RD&D program.

#### IV. SUMMARY OF HEARINGS

During the 107th Congress, the Full Committee on Science held four hearings, and the Subcommittee on Energy held nine hearings relevant to H.R. 238. Those hearings are described in the Summary of Activities, Committee on Science, U.S. House of Representatives for the 107th Congress (H. Rept. 107–809).

Thus far, during the 108th Congress, the Full Committee on Science has held three hearings relevant to H.R. 238:

1. February 13, 2003 hearing on “An Overview of the Federal R&D Budget for Fiscal Year 2004.” Appearing as witnesses were (1) Dr. John Marburger, Director, Office of Science and Technology Policy (OSTP); (2) Dr. Samuel W. Bodman, Deputy Secretary, Department of Commerce; (3) Dr. Rita R. Colwell, Director, National Science Foundation (NSF); and (4) Mr. Robert Card, Under Secretary of Energy for Energy, Science and Environment, DOE.

2. March 5, 2003 hearing on “The Path to a Hydrogen Economy.” Appearing as witnesses were (1) Mr. David Garman, Assistant Secretary for Energy Efficiency and Renewable Energy, Department of Energy; (2) Dr. Allan C. Lloyd, Chairman, California Fuel Cell Partnership; (3) Dr. Joan Ogden, Research Scientist, Princeton Environmental Institute; (4) Dr. Larry Burns, Vice President, Research, Development and Planning, General Motors; and (5) Mr. Don Huberts, Chief Executive Officer, Shell Hydrogen.

3. March 19, 2003 hearing on “H.R. 766, The Nanotechnology Research and Development Act of 2003.” Appearing as witnesses were (1) Senator George Allen (R–VA); (2) Senator Ron Wyden (D–OR); (3) Mr. Richard M. Russell, Associate Director for Technology, OSTP; (4) Dr. Thomas N. Theis, Director of Physical Sciences, IBM Research Division, Thomas J. Watson Research Center in Yorktown, New York; (5) Dr. James Roberto, the Associate Laboratory Director for Physical Sciences, Oak Ridge National Laboratory; (6) Dr. Carl A. Batt, Co-Director, Nanobiotechnology Center, Cornell University; and (7) Mr. Alan Marty, executive-in-residence, JP Morgan.

#### V. COMMITTEE ACTIONS

As summarized in H. Rept. 107–809, the Full Committee on Science heard testimony in the 107th Congress relevant to the programs authorized in H.R. 238 at hearings held on February 28, May 23, and June 21, 2001, and on February 2, 2002; the Subcommittee on Energy heard testimony relevant to the programs authorized in H.R. 238 at hearings held on March 22, April 26, May 3, May 17, May 24, June 12, and June 14, 2001, and on June 24 and June 26, 2002.

On January 8, 2003, Chairman Sherwood L. Boehlert of the Committee on Science introduced H.R. 238, the Energy Research, Development, Demonstration, and Commercial Application Act of 2003, a bill to provide for Federal energy research, development, demonstration, and commercial application activities, and for other purposes.

As summarized above, the Full Committee heard testimony in the 108th Congress relevant to the programs authorized in H.R. 238 at hearings held on February 13, March 5, and March 19, 2003.

The Subcommittee on Energy was discharged from further consideration of H.R. 238 on March 20, 2003.

The Committee on Science met to consider H.R. 238 on Wednesday, April 2, 2003, and considered the following amendments to the bill:

1. Mr. Miller offered an amendment to allow DOE to make grants to nonprofit institutions to establish a nationwide network of Advanced Energy Technology Transfer Centers. The amendment was adopted by voice vote.

2. Mr. Matheson offered an amendment to require the demonstration and field testing of distributed generation systems. He asked for unanimous consent to offer his amendment out of order, not to the bill, but to the en bloc amendments (number 8) to be offered by Chairman Boehlert and Ranking Member Hall. The unanimous consent request was agreed to and the amendment was adopted as part of the en bloc amendments.

3. Mr. Costello and Mr. Calvert offered an amendment to the bill to require the Nuclear Regulatory Commission (NRC) and Occupational Safety and Health Administration (OSHA) to regulate nuclear and worker safety and health at DOE's non-military laboratories. The amendment was adopted by voice vote.

4. Mrs. Biggert, Mr. Davis (TN) and Mr. Smith (MI) offered an amendment to authorize the Genomes to Life program. The amendment was adopted by voice vote.

5. Mr. Udall (CO) offered an amendment regarding Federal Laboratory Educational Partners. The amendment was adopted by voice vote.

6. Ms. Jackson-Lee offered an amendment to promote inter-agency cooperation between the Department of Energy and the National Aeronautics and Space Administration. The amendment was adopted by voice vote.

7. Mr. Rohrabacher offered an amendment to authorize a DOE graduate scholarship program for U.S. citizens. The amendment was adopted by voice vote.

8. Chairman Boehlert and Mr. Hall offered amendments en bloc to various portions of the bill. The en bloc amendments, which were accepted en bloc and agreed to by voice vote, comprised many technical, clarifying and conforming changes, as well as a number of substantive changes to the underlying bill as follows:

- a. deleted all funding authorizations for fiscal year 2003;
- b. redesignated sections 101 (Purposes), 102 (Goals), and 103 (Definitions) as section 2, 3, and 4 and modified them to apply to the entire Act;
- c. amended section 3, as redesignated, to adjust specific technology and performance goals for various programs authorized by the Act so they better reflect current research targets and to include performance goals for the production and delivery of hydrogen;
- d. amended section 4, as redesignated, to delete the Environmental Measurement Laboratory, which was transferred to the Department of Homeland Security, from the definition of "Single-Purpose Research Facilities";
- e. added a new section (Section 106A. Electric Motor Control Technology) to direct the Secretary of Energy (the Secretary) to conduct a research, development, demonstration, and commer-

cial application program on advanced control devices to improve energy efficiency of electric motors used in heating, ventilation, and air conditioning (HVAC) and comparable systems and amended section 104 (Energy Efficiency);

f. amended section 106 (National Building Performance Initiative) to include a requirement that DOE coordinate with the National Institute of Building Sciences when implementing the National Building Performance Initiative;

g. struck section 109 (Advanced Vehicle Technology), which was superseded by subtitle H of title I (Hydrogen);

h. amended section 111 (Distributed Energy and Electric Energy Systems) to adjust the authorization of appropriations for section 114 (Micro-Cogeneration Energy Technology);

i. amended section 112 (Strategy) to include research, development, demonstration, and commercial application of interconnection technologies for communications and controls of distributed generation architectures as part of the distributed power strategy;

j. amended section 121 (Renewable Energy) to delete funding authorization for hydrogen programs, which were superseded by subtitle H of title I, to provide additional authorization allocations for a new section 127 (Renewable Energy in Public Buildings), and to provide a specific authorization for the Regional Field Verification Program;

k. amended section 126 (Miscellaneous Projects) to require the Secretary to enter into an arrangement with the National Academy of Sciences to conduct a study on the feasibility of renewable generation of energy from the ocean;

l. added a new section 127 (Renewable Energy in Public Buildings) to require the Secretary to establish a program for the demonstration of technologies for solar and other renewable energy sources in State or local government buildings;

m. amended section 131 (Nuclear Energy) to conform to the format of the rest of the bill, to increase the overall funding for nuclear energy to reflect the President's request for fiscal year 2004, and to adjust the authorization allocations for University Programs;

n. added a new section (section 135. Geological Isolation of Spent Fuel) to require the Secretary to establish a program to determine the feasibility of deep borehole disposal of spent nuclear fuel and high-level radioactive waste;

o. amended section 141 (Fossil Energy) to clarify that Fossil Energy funding in title I, subtitle E is separate from Clean Coal funding in title V;

p. amended section 142 (Fossil Energy Research Programs) to remove the limitation on authority to use funds to carry out the program absent transmittal of the report required under the section, to add a coordination requirement for the fuel cell research, development, demonstration and commercial application program, and to add technology transfer requirements related to oil and gas exploration;

q. added a new section (section 150A. Transfer of Advanced Oil and Gas Exploration and Production Technologies) to require the Secretary to review government-wide technology programs to assess their suitability to ultra-deepwater research,

development, demonstration, and commercial application and to issue a solicitation for management of technology transfer activities;

r. amended section 161 (Science) to provide greater authorizations for fiscal years 2006 and 2007 and to provide specific authorization allocations for sections 161A, 162, and 169 relating to fusion energy and nanotechnology;

s. added a new section (section 161A. ITER) to authorize the United States participation in an international fusion experiment known as ITER, provided that the conditions set forth in section 161A are met;

t. modified section 162 (Plan for Fusion Experiment) to require a plan for a domestic burning plasma experiment if the Secretary deems the construction and operation of ITER to be unlikely or infeasible;

u. modified section 163 (Plan for Fusion Energy Sciences Program) to include additional elements in the plan for United States fusion research, development, demonstration and commercial application;

v. amended section 169 (Nanoscale Science and Engineering Research) to delete the separate authorization for user facilities, to redesignate the section as “Nanotechnology Research and Development”; and to require research on societal and ethical concerns related to nanotechnology research;

w. added a new section (section 170A. Nitrogen Fixation) to require the Secretary to support a program on biological nitrogen fixation, including plant genomics research;

x. deleted section 177 (Technology Transfer);

y. added a new section (section 178. Fuel Test Center) to require the Secretary to transmit to the Congress a report on the results of a study of the establishment of a test center for next-generation fuel cells at an institution of higher education;

z. added a new subtitle (subtitle H. Hydrogen) to authorize the President’s FreedomCAR and Hydrogen Initiative programs, which (a) creates a research, development, demonstration, and commercial application program for hydrogen-powered fuel cell vehicles and the refueling infrastructure to support them, with the goal of enabling the automotive industry to make a decision to bring such vehicles to market by 2015; (b) makes clear that the program should include research on producing hydrogen from fossil fuels (with carbon sequestration), renewable energy, and nuclear power; (c) ensures that grants awarded under the program are competitive and subject to merit review; (d) requires DOE to submit a detailed plan to Congress describing the program’s research agenda, the technical milestones used to evaluate the performance of the program, and the role that national laboratories, universities, small businesses and other partners will play; (e) specifies criteria demonstration projects must meet; (f) creates an inter-agency task force to assist in the implementation of the program and an advisory committee, comprising representatives from domestic industry, academia, professional societies, government agencies and other organizations to provide advice to the Secretary; (g) requires a competitively selected non-governmental body, such as the National Academy of Sciences, to re-

view the program's research plan and conduct a biennial review of the progress made by the program; and (h) authorizes \$1.8 billion for the program over five years;

aa. added new requirements for utilization, establishment and responsibilities of advisory committees within the Office of Science;

bb. added a new section 194 (University Collaboration) to require the Secretary to submit to the Congress a report examining the feasibility of collaboration between small and large institutions of higher education for energy projects;

cc. added a new section 202 (Report on Equal Employment Opportunity Practices) to require the Secretary to submit to the Congress a biennial report on the equal employment opportunity practices at nonmilitary energy laboratories;

dd. added a new section 303 (Diesel Retrofit Program) to require the Administrator of the Environmental Protection Agency (EPA) and the Secretary to establish a program for awarding grants for the demonstration and commercial application of retrofit technologies for diesel school buses as part of the Clean School Bus program in title III of the underlying bill; and

ee. added a new section 404 (Fuel Cell Transit Bus Demonstration) to require the Secretary to establish a transit bus demonstration program to make awards for projects to demonstrate fuel cell transit buses with preference given to projects likely to mitigate congestion and improve air quality;

9. Mr. Wu offered an amendment to the en bloc amendments (number 8) to direct the Secretary to work with the National Institute of Standards and Technology (NIST), Institute of Electrical and Electronics Engineers (IEEE), and other standards development organizations to develop voluntary consensus standards for distributed energy systems. The amendment was adopted as part of the en bloc by voice vote.

10. Ms. Eddie Bernice Johnson offered an amendment to the en bloc amendments (number 8) to establish a timeframe for the safe and convenient commercial production and delivery of hydrogen. The amendment was adopted as part of the en bloc by voice vote.

11. Mr. Sherman and Mr. Bell offered an amendment to the en bloc amendments (number 8) to specify research to be conducted by DOE on the societal and ethical aspects of nanotechnology. Chairman Boehlert asked for unanimous consent that the amendment be incorporated into the en bloc amendments (number 8). The request was agreed to and the amendment was adopted as part of the en bloc amendments by voice vote.

12. Mr. Udall (CO) offered an amendment regarding Global Change Research and Data Management. The amendment was withdrawn.

With a quorum present, Mr. Hall moved that the Committee favorably report the bill, H.R. 238, as amended, to the House with the recommendation that the bill as amended do pass; that the staff be instructed to prepare the legislative report and make necessary technical and conforming changes; and that the Chairman take all necessary steps to bring the bill before the House for consideration. The motion was agreed to by voice vote.

Mr. Boehlert moved that: (1) Members have two subsequent calendar days in which to submit supplemental, minority or additional

views on the measure; and (2) pursuant to clause 1 of rule XXII of the Rules of the House of Representatives, the Chairman may offer such motions as may be necessary in the House to go to conference with the Senate on H.R. 238 or a similar Senate bill.

## VI. SUMMARY OF MAJOR PROVISIONS OF BILL

Sections 1 through 4 of the bill contain a short title, purposes, goals and definitions. The goals section includes quantitative near-term and long-term goals for energy efficiency, distributed energy and electric energy systems, renewable energy, fossil energy, nuclear energy, and hydrogen.

### TITLE I—RESEARCH AND DEVELOPMENT

Subtitle A (Energy Efficiency) authorizes \$2.9 billion for fiscal years 2004–2007 including \$200 million for a Next Generation Lighting Initiative, \$25 million for secondary electric vehicle battery recycling and \$110 million for the Energy Efficiency Science Initiative.

Subtitle B (Distributed Energy and Electric Energy Systems) authorizes \$850 million for fiscal years 2004–2007, including authorization for a strategy to develop renewable-fossil distributed hybrid power systems and programs relating to high power density industries, and \$23 million for micro-cogeneration and authorization for transmission infrastructure system RD&D and commercial application programs.”

Subtitle C (Renewable Energy) authorizes \$1.8 billion for fiscal years 2004–2007 including \$639 million for bioenergy, and \$120 million for grants to local governments for use of renewables in public buildings.

Subtitle D (Nuclear Energy) authorizes \$1.7 billion for fiscal years 2004–2007, including authorizations for Nuclear Power 2010, the “Gen IV” program, and the Proliferation Resistant Advanced Fuel Recycling and University Nuclear Science and Engineering Programs.

Subtitle E (Fossil Energy) authorizes \$2.3 billion for fiscal years 2004–2007 (not including a separate authorization for Clean Coal Power Initiative) for power technologies, oil and gas technologies, fuel cells, and coal mining technology and for an Arctic Energy Office. It also includes an authorization enabling 7.5 percent of oil and gas royalty funds (estimated by the Congressional Budget Office to be \$1.9 billion for fiscal years 2004 through 2007) to be used for ultra-deepwater and unconventional oil and gas research.

Subtitle F (Science) authorizes \$17.9 billion for fiscal years 2003–2007, including \$1.4 billion for Fusion, \$349 million for the Spallation Neutron Source, and \$1.23 billion for Nanotechnology. It also authorizes a graduate fellowship program for U.S. citizens and a program in the genetics, protein science and computational biology of microbes and plants, which is authorized at \$100 million for fiscal year 2004 and such sums as are necessary through fiscal year 2007. It also requires a Facilities Infrastructure Plan for the National Laboratories.

Subtitle G (Energy and Environment) authorizes \$24 million for various specified projects.

Subtitle H (Hydrogen) authorizes \$1.8 billion through fiscal year 2008 to carry out the President's Hydrogen Initiative, including research, development, demonstration and commercial application of fuel cells, hydrogen production and FreedomCAR vehicle technology.

Subtitle I (Management) includes general requirements relating to expenditure and reprogramming of funding, cost sharing, merit and external technical review, small and minority businesses, mobility of scientific and tech personnel at labs, outreach and competitive awards.

#### TITLE II—DEPARTMENT OF ENERGY MANAGEMENT

This Title Designates the head of the Office of Science as an Assistant Secretary and transfers health and nuclear regulation at DOE non-military labs to the Occupational Safety and Health Administration and the Nuclear Regulatory Commission (NRC). It includes a section requiring a report on equal opportunity practices at DOE labs.

#### TITLE III—CLEAN SCHOOL BUSES

This title establishes a three-year, \$300 million demonstration program of alternative fuel, clean diesel and fuel cell school buses. It includes an additional authorization for a clean diesel school bus retrofit demonstration program.

#### TITLE IV—ALTERNATIVE FUELED AND ADVANCED VEHICLES

This title establishes a \$200 million demonstration program of alternative fueled and advanced vehicles and supporting infrastructure used in intermodal transportation.

#### TITLE V—CLEAN COAL

This title authorizes \$200 million per year for fiscal years 2003 through 2011 for a Clean Coal Initiative involving projects that meet technical, environmental, and financial criteria. It also establishes centers of excellence.

### VII. SECTION-BY-SECTION ANALYSIS

**Summary:** The purpose of H.R. 238, the Energy Research, Development, Demonstration, and Commercial Application Act of 2003, is to provide for Federal energy research, development, and demonstration, and commercial application of energy technology programs, projects, and activities of DOE, and for other purposes.

#### *Sec. 1. Short title; table of contents*

This section specifies that this Act may be cited as the "Energy Research, Development, Demonstration, and Commercial Application Act of 2003" and also lists the table of contents for the bill.

#### *Sec. 2. Purposes*

This section lists six purposes relating to energy savings and production, national security, environmental impacts, and economic growth in connection with energy research programs and activities.

*Sec. 3. Goals*

This section describes quantitative goals for the various programs of the Department in energy efficiency, distributed energy and electric energy systems, renewable energy, nuclear energy, fossil energy and hydrogen. It requires the Secretary to periodically review the goals and report on any proposed modifications to the goals. In addition, it specifies that stated goals do not create or limit any authority for Federal agencies or create any new requirements and cannot be used to support the establishment of regulatory standards or requirements.

*Sec. 4. Definitions*

This section defines various terms commonly used in the bill.

## TITLE I—RESEARCH AND DEVELOPMENT

## Subtitle A—Energy Efficiency

## PART 1—AUTHORIZATION OF APPROPRIATIONS

*Sec. 104. Energy efficiency*

This section authorizes \$2.9 billion for Energy Efficiency programs at the Department for fiscal years 2004–2007. Of this amount, \$200 million is for a Next Generation Lighting Initiative, \$8 million for an Electric Motor Control Technology Program, \$25 million for a Secondary Electric Vehicle Battery Program, and \$110 million for the Energy Efficiency Science Initiative. This section also provides an additional \$250 million authorization for fiscal years 2008 through 2012 for the Lighting Initiative and includes a subsection preventing the use of funds for developing energy efficiency regulations or for programs funded under other authorities.

## PART 2—LIGHTING SYSTEMS

*Sec. 105. Next Generation Lighting Initiative*

This section requires the Secretary to carry out a Next Generation Lighting Initiative to be jointly funded by industry and the Federal government and largely carried out by a competitively-selected industry consortium. The section specifies government and private sector roles.

## PART 3—BUILDINGS

*Sec. 106. National Building Performance Initiative*

This section requires the Director of OSTP to establish an inter-agency group to integrate Federal, State and voluntary private sector cost reduction efforts for buildings and to develop a plan for a public-private program to improve building performance.

*Sec. 106A. Electric motor control technology*

This section requires the Secretary to conduct a program of research, development, demonstration and commercial application on advanced control technologies for increasing the efficiency of electric motors.

## PART 4—VEHICLES

*Sec. 107. Definitions*

This section provides definitions for section 108, Establishment of Secondary Electric Battery Use Program.

*Sec. 108. Establishment of secondary electric battery use program*

This section requires the Secretary to establish a research program to facilitate the reuse of batteries from electric vehicles for other purposes, such as bulk power and commercial power storage.

## PART 5—ENERGY EFFICIENCY SCIENCE INITIATIVE

*Sec. 110. Energy Efficiency Science Initiative*

This section requires the Secretary to establish an energy efficiency research program run jointly by the Director of the Office of Science and the Assistant Secretary of Energy with responsibility for energy conservation.

## PART 6—ADVANCED ENERGY TECHNOLOGY TRANSFER CENTERS

*Sec. 110A. Advanced Energy Technology Transfer Centers*

This section requires the Secretary to make grants to non-profits or State and local governments or universities or consortia thereof to establish a nationwide network of at least ten Advanced Energy Technology Transfer Centers to encourage demonstration and commercial application of energy efficiency technologies.

## Subtitle B—Distributed Energy and Electric Energy Systems

## PART 1—AUTHORIZATION OF APPROPRIATIONS

*Sec. 111. Distributed Energy and Electric Energy Systems*

This section authorizes \$850 million for the Distributed Energy and Electric Energy Systems programs for fiscal years 2004–2007, including \$23 million for Micro-cogeneration.

*Sec. 111A. Demonstration and field test*

This section requires the Secretary to demonstrate and field test distributed generation systems.

## PART 2—DISTRIBUTED POWER

*Sec. 112. Strategy*

This section requires the Secretary to develop a hybrid distributed power research strategy to be transmitted to Congress within one year.

*Sec. 113. High power density industry program*

This section requires the Secretary to establish a comprehensive research, development, demonstration and commercial application program to improve the energy efficiency of facilities such as data centers, “server farms,” and telecommunications facilities.

*Sec. 114. Micro-cogeneration energy technology*

This section requires the Secretary to make competitive merit-based grants to consortia for the development of residential combined heat and power technologies.

## PART 3—TRANSMISSION SYSTEMS

*Sec. 115. Transmission infrastructure systems research, development, demonstration, and commercial application*

This section requires the Secretary to develop and implement a research, development, demonstration and commercial application program to promote improved efficiency and reliability of electrical transmission systems.

## PART 4—GENERAL PROVISIONS

*Sec. 116. Definitions*

This section lists technologies that could comprise distributed hybrid technologies.

*Sec. 117. Voluntary consensus standards*

This section requires the Secretary to work with IEEE and others towards the development and implementation of voluntary consensus standards for the manufacture and use of distributed energy systems for connection with electric distribution systems.

## Subtitle C—Renewable Energy

## PART 1—AUTHORIZATION OF APPROPRIATIONS

*Sec. 121. Renewable energy*

This section authorizes \$1.8 billion for the Renewable Energy programs at the Department for fiscal years 2004–2007. Of this amount, \$639 million is authorized for bioenergy and \$120 million for renewable energy in public buildings. Within the bioenergy authorization, not less than \$5 million is for Historically Black Colleges and Universities and Hispanic Serving Institutions. No less than \$4 million per year is authorized for field verification of wind turbines.

## PART 2—BIOENERGY

*Sec. 122. Bioenergy programs*

This section requires that the Secretary conduct a research, development, demonstration, and commercial application program on biopower and biofuels, including integrated, cross-cutting and economic analysis programs.

## PART 3—MISCELLANEOUS PROJECTS

*Sec. 126. Miscellaneous projects*

This section requires the Secretary to establish programs of research, development, demonstration, and commercial application in ocean energy (including wave energy), hybrid wind-coal gasification energy technologies, combined use of renewable energy and other energy technologies and hydrogen carrier fuels. It also directs the

Secretary to request that the National Academy of Sciences conduct a study on renewable generation of ocean energy including wave, tidal, current and thermal energy.

*Sec. 127. Renewable energy in public buildings*

This section requires the Secretary to establish a program for the demonstration of innovative renewable energy technologies in State and local government buildings.

Subtitle D—Nuclear Energy

PART 1—AUTHORIZATION OF APPROPRIATIONS

*Sec. 131. Nuclear energy*

This section authorizes \$1.7 billion for fiscal years 2004–2007 for the nuclear energy research, development, demonstration, and commercial application programs, including programs that are authorized in the parts of this subtitle that follow. In fiscal years 2004–2007, it authorizes \$530 million for infrastructure support programs, \$399 million for advanced fuel recycling, \$184 million for university programs, and \$34 million for geologic isolation of spent fuel.

PART 2—NUCLEAR ENERGY RESEARCH PROGRAMS

*Sec. 132. Nuclear energy research programs*

This section requires the Secretary to carry out five nuclear energy research programs at the Department: the Nuclear Energy Research Initiative, the Nuclear Energy Plant Optimization Program, the Nuclear Power 2010 Program, the Generation IV Nuclear Energy Systems Initiative and research on Reactor Production of Hydrogen. It also authorizes Infrastructure Support.

PART 3—ADVANCED FUEL RECYCLING

*Sec. 133. Advanced fuel recycling program*

This section requires the Secretary to carry out a nuclear fuel recycling technology research and development program on proliferation-resistant technologies. This research will focus on technologies that also minimize environmental and public health and safety impacts.

PART 4—UNIVERSITY PROGRAMS

*Sec. 134. University nuclear science and engineering support*

This section requires the Secretary to support new and existing programs to promote university research and education in nuclear engineering.

PART 5—GEOLOGICAL ISOLATION OF SPENT FUEL

*Sec. 135. Geological isolation of spent fuel*

This section requires that the Secretary carry out a program to determine the feasibility of deep-borehole disposition of high-level radioactive waste.

## Subtitle E—Fossil Energy

## PART 1—AUTHORIZATION OF APPROPRIATIONS

*Sec. 141. Fossil energy*

This section authorizes \$2.3 billion for fiscal years 2004–2007 to carry out the fossil energy, research, development, demonstration, and commercial application programs of the Department, excluding programs that are authorized in title V—Clean Coal. It also requires that the coal program authorized under section 142(a) comprise at least 60 percent of this total. Of the \$2.3 billion total, this section authorizes \$112 million for proton exchange membrane fuel cells, \$27 million for coal mining technologies and \$100 million for Office of Arctic Energy programs. This section also authorizes \$100 million in fiscal years 2008–2012 for Office of Arctic Energy programs. In addition to the \$2.3 billion authorization, this section also authorizes funding for the ultra-deepwater and unconventional resources programs, with the funds coming from 7.5 percent of the royalties, rents, and bonuses derived from Federal onshore and offshore oil and gas leases, with priority given to prior distributions required by law; such funding would be subject to appropriations Acts. The CBO estimates the revenue from these sources available to carry out the program will be \$1.9 billion for fiscal years 2004–2007.

## PART 2—RESEARCH PROGRAMS

*Sec. 142. Fossil energy research programs*

This section requires the Secretary to conduct a program of fossil energy research, development, demonstration and commercial application, including research on coal, oil, natural gas, and fuel cells. It also includes subsections requiring the Secretary of the Interior to transmit a report on natural gas and oil deposits off of the Louisiana and Texas coasts every two years and mandating the use of existing technology transfer mechanisms.

*Sec. 143. Research and development for coal mining technologies*

This section requires the Secretary to establish a program of research and development with Federal agencies, coal producers, trade associations, equipment manufacturers, institutions of higher education and others to develop new mining technologies.

PART 3—ULTRA-DEEPWATER AND UNCONVENTIONAL  
NATURAL GAS AND OTHER PETROLEUM RESOURCES*Sec. 144. Program authority*

This section requires the Secretary to conduct programs of research, development, demonstration, and commercial application on ultra-deepwater and unconventional natural gas and other petroleum resource exploration, production and environmental mitigation. It also limits the programs to work in areas currently eligible to be leased for exploration and requires consultation with the Secretary of the Interior.

*Sec. 145. Ultra-deepwater program*

This section describes how the ultra-deepwater program should be carried-out, assigning responsibilities to the Secretary and a private consortium selected by the Secretary to help manage the program. It also establishes procedures to address conflicts of interest.

*Sec. 146. Unconventional natural gas and other petroleum resources program*

This section requires the Secretary to establish a research, development, demonstration and commercial application program for on-shore unconventional oil and gas exploration for resources in economically inaccessible geographical areas.

*Sec. 147. Additional requirements for awards*

This section places requirements on applicants to the ultra-deepwater program to describe the intended commercial use of any technology to be demonstrated under the Act, and provides flexibility concerning the location of demonstration projects in deepwater depths of less than 1,500 meters and cost sharing for independent producers.

*Sec. 148. Advisory committees*

This section requires the Secretary to establish advisory committees for ultra-deepwater and unconventional resource programs and specifies their duties and compensation levels for their members.

*Sec. 149. Limits on participation*

This section provides for limits on the entities entitled to participate in the program.

*Sec. 150. Fund*

This section establishes in the Treasury an Ultra-Deepwater and Unconventional Natural Gas and Other Petroleum Resources Fund.

*Sec. 150A. Transfer of advanced oil and gas exploration and production technologies*

The section requires the Secretary to assess Federal technology programs and issue a solicitation to manage a technology transfer program of such technologies.

*Sec. 151. Sunset*

The section terminates the ultra-deepwater and unconventional research programs on September 30, 2010.

*Sec. 152. Definitions*

This section provides seven definitions for terms used in this part.

## Subtitle F—Science

## PART 1—AUTHORIZATION OF APPROPRIATIONS

*Sec. 161. Science*

This section authorizes \$17.9 billion for fiscal years 2004–2007 to carry out the research, development, demonstration, and commercial application programs of the Office of Science, including programs that are authorized in the parts of this subtitle that follow. From this amount, the section authorizes \$1.27 billion for Fusion Energy Sciences, \$157 million for the ITER fusion experiment, \$349 million for the Spallation Neutron Source, \$1.23 billion for nanotechnology, \$100 million in fiscal year 2004 and additional sums in fiscal years 2005–2007 for the Genomes to Life Program, and \$6.4 million for a new graduate scholarship program for U.S. citizens.

## PART 2—FUSION ENERGY SCIENCES

*Sec. 161A. ITER*

This section authorizes the Secretary to join the international fusion experiment, known as ITER and requires that any agreement into which the U.S. enters meet specific requirements to protect U.S. economic and scientific interests. It also requires the Department to submit a research plan to Congress and for that plan to be reviewed by the National Academy of Sciences. Finally, it prohibits any U.S. funding for ITER construction until the Secretary has submitted to Congress the research plan, the international agreement for U.S. participation in ITER, a description of ITER's management structure, and a report describing how ITER will be funded without reducing funding for other programs, including other fusion programs, in the Office of Science.

*Sec. 162. Plan for fusion experiment*

This section requires the Secretary to restart planning for the domestic magnetic fusion burning plasma experiment (called the Fusion Ignition Research Experiment or “FIRE”) if the Secretary determines during the negotiations on ITER that construction and operation of ITER is unlikely or infeasible.

*Sec. 163. Plan for fusion energy sciences program*

This section requires the Secretary to develop a program and submit a plan to Congress to provide a strong scientific base for Fusion Energy Sciences and the experiments described in Secs. 161A and 162.

## PART 3—SPALLATION NEUTRON SOURCE

*Sec. 164. Definition*

This section provides a definition for “Spallation Neutron Source.”

*Sec. 165. Report*

This section requires the Secretary to report on the Spallation Neutron Source as part of its annual budget submission.

*Sec. 166. Limitations*

This section provides limitations for the amounts obligated for Spallation Neutron Source.

## PART 4—MISCELLANEOUS

*Sec. 167. Facility and infrastructure support for non-military energy laboratories*

This section requires the Secretary to develop and implement a policy for maintaining, closing, modifying, or constructing new facilities and infrastructure at non-military energy laboratories. The policy must be communicated in a report transmitted to Congress by 2005.

*Sec. 168. Research regarding precious metal catalysis*

This section authorizes research on the use of precious metals in catalysis.

*Sec. 169. Nanotechnology research and development*

This section requires the Secretary to support a program of research, development, demonstration, and commercial application of technology in nanoscale science and engineering within the Office of Science. The section also requires the program to (a) support nanotechnology R&D through grants and interdisciplinary research centers and advanced technology user facilities; (b) encourage interdisciplinary research; (c) expand education and training; (d) accelerate commercial application of nanotechnology innovations; and, (e) ensure that societal and ethical concerns are addressed.

*Sec. 170. Advanced scientific computing for energy missions*

This section requires the Secretary to support a program to advance high performance computing and requires a report to Congress before the Department can undertake an initiative on new computer architecture. It also amends the definitions and the general responsibilities of DOE in the High-Performance Computing Act of 1991 (P.L. 108–3 Title 15, Chapter 81).

*Sec. 170A. Nitrogen fixation*

This section requires the Secretary to support an R&D program on biological nitrogen fixation, including plant genomics research.

## PART 5—GENOMES TO LIFE

*Sec. 170B. Genomes to life*

This section requires the Secretary to authorize within the Office of Science a research, development, demonstration, and commercial application program known as the “Genomes to Life” program. The program builds on the Department’s work on the human genome project and expands research into proteomics. This section directs the program to identify biological processes that could be developed for energy- and environment-related applications. It also authorizes grants to construct Genomes to Life research facilities.

*Sec. 170C. Department of Energy science and technology scholarship program*

This section requires the Secretary to create a scholarship program in which students receive scholarships in exchange for a commitment to work for the Department upon completion of their degrees. Scholarship recipients are obligated to work two years for each year of scholarship they receive.

Subtitle G—Energy and Environment

*Sec. 171. Authorization of appropriations*

This section authorizes \$23 million for U.S.-Mexico Energy Technology, and \$500,000 for waste carpet incineration studies.

*Sec. 172. United States-Mexico energy technology cooperation*

This section requires the Secretary to establish a collaborative research, development, demonstration, and commercial application program to promote efficient, environmentally sound development along the U.S.-Mexico border.

*Sec. 173. Waste reduction and use of alternatives*

This section authorizes the Secretary to make a single university grant to examine and develop the feasibility of burning post-consumer carpet in cement kilns as an alternative energy source.

*Sec. 174. Coal gasification*

This section authorizes loan guarantees for an energy project using integrated gasification combined cycle technology.

*Sec. 175. Petroleum coke gasification*

This section authorizes loan guarantees for at least one petroleum coke gasification project.

*Sec. 176. Other biopower and bioenergy*

This section requires the Secretary to assist in the planning, design and implementation of several identified projects to produce biopower and biofuels.

*Sec. 177. Coal technology loans*

This section authorizes \$125 million to provide a loan for an experimental plant constructed under a Department of Energy cooperative agreement.

*Sec. 178. Fuel cell test center*

This section requires the Secretary to transmit to Congress a study of the establishment of a test center for next-generation fuel cells at an institution of higher education and authorizes \$500,000 to carry out the section.

Subtitle H—Hydrogen

*Sec. 181. Short title*

This section designates the subtitle as the “George E. Brown, Jr. and Robert S. Walker Hydrogen Future Act of 2003.”

*Sec. 182. Matsunaga Act amendment*

This section amends the text of the “Matsunaga Hydrogen Research, Development and Demonstration Act of 1990 (42 U.S.C. 12401)” as follows:

**SEC. 102. FINDINGS AND DEFINITIONS.**

This section includes findings and definitions used in the subtitle.

**SEC. 103. PROGRAM.**

This section requires that the Secretary carry out a research, development, demonstration, and commercial application program for hydrogen-powered fuel cell vehicles and the refueling infrastructure to support them, with the goal of enabling the automotive industry to make a decision to bring such vehicles to market by 2015. The section specifies activities related to hydrogen production, delivery, and storage and the development of fuel cell technologies and the necessary codes and standards. It establishes project selection criteria for a hydrogen demonstration program. It also requires a competitive merit review process and specifies cost sharing requirements.

**SEC. 104. FREEDOM CAR.**

This section requires that the Secretary carry out a research, development, demonstration and commercial application program for advanced vehicle technologies and specifies activities and requirements for the program.

**SEC. 105. PLAN.**

This section requires the Department to submit a detailed plan to Congress describing the program’s research agenda, the technical milestones used to evaluate the performance of the program, and the role that national laboratories, universities, small businesses and other partners will play.

**SEC. 106. EDUCATION, OUTREACH AND TECHNOLOGY TRANSFER.**

This section includes requirements for education, outreach and technology transfer.

**SEC. 107. INTERAGENCY TASK FORCE.**

This section creates an interagency task force, chaired by the Director of OSTP, to assist in the implementation of the program.

**SEC. 108. ADVISORY COMMITTEE.**

This section creates an advisory committee, comprised of representatives from domestic industry, academia, professional societies, government agencies, and other organizations, to provide advice to the Secretary.

**SEC. 109. EXTERNAL REVIEW.**

This section requires a competitively-selected non-governmental body, such as the National Academy of Sciences, to review the program’s research plan and conduct a biennial review of the progress made by the program.

**SEC. 110. MISCELLANEOUS PROVISIONS.**

This section requires the Secretary to avoid unnecessary duplication when carrying out the activities under this Act, authorizes the Secretary to enter into cost-sharing agreements with other governments, authorizes the Secretary to represent the United States, and provides that nothing in the Act alters the Department's regulatory authority.

**SEC. 111. AUTHORIZATION OF APPROPRIATIONS.**

This section authorizes \$1.8 billion for the program for fiscal years 2004–2008.

*Sec. 183. Repeal of Hydrogen Future Act of 1996*

This section repeals the Hydrogen Future Act of 1996.

## Subtitle I—Management

*Sec. 184. Availability of funds*

This section provides that funds appropriated to the Department under this title shall remain available until expended.

*Sec. 185. Cost sharing*

This section requires minimum non-Federal contributions of 20 percent of the cost of research and development, and 50 percent for demonstration and commercial application projects. It allows the Secretary to reduce these requirements based on either the technical barriers or the fundamental nature of the research.

*Sec. 186. Merit review of proposals*

This section requires an impartial review of the scientific and technical merit of project proposals.

*Sec. 187. External technical review of departmental programs*

This section requires the Secretary to establish new or designate existing advisory committees to review research, development, demonstration, and commercial application programs for energy efficiency, renewable energy, nuclear energy and fossil energy. It also requires the Secretary to establish a Science Advisory Committee for the Office of Science and to contract with the National Academy of Sciences for periodic review and assessment of programs.

*Sec. 188. Improved coordination of technology transfer activities*

This section requires the Secretary to establish a Technology Transfer Coordinator for the Department and a Technology Transfer Working Group comprising representatives from all the National Laboratories and single-purpose research facilities.

*Sec. 189. Small business advocacy and assistance*

This section requires National Laboratories and facilities to establish an outreach program for small and minority businesses.

*Sec. 190. Mobility of scientific and technical personnel*

This section requires the Secretary to report to Congress on any disincentives to sharing staff among National laboratories and single-purpose research facilities.

*Sec. 191. National Academy of Sciences report*

This section requires the National Academy of Sciences to study the impediments to decreasing the time to commercial application of new energy technology innovations, and ways to improve the Department's technology transfer activities.

*Sec. 192. Outreach*

This section requires the Secretary to ensure that each program authorized by this title includes an outreach component.

*Sec. 193. Limits on use of funds*

This section prohibits award of management and operations contracts for federal non-military energy laboratories unless they are made on a competitive basis, or unless the Secretary provides a waiver and Congress is notified two months in advance.

*Sec. 194. Reprogramming*

This section requires the Secretary to issue a report 60 days after appropriations are enacted of how appropriated funds will be distributed under this authorization. It also requires a 30-day Congressional review for any reprogramming that exceeds 5 percent of any individual distribution.

*Sec. 195. Construction with other laws*

This section lists other laws that grant relevant authority to the Secretary.

*Sec. 196. University collaboration*

This section requires the Secretary to report to Congress on promoting collaborations between large and small institutions of higher education.

*Sec. 197. Federal laboratory educational partners*

This section amends the Stevenson-Wydler Act (15 U.S.C. 3710c) to broaden the activities the Department's National Laboratories may conduct with income generated through their intellectual property rights to include educational assistance.

*Sec. 198. Interagency cooperation*

This section directs the Secretary of Energy and the Administrator of the National Aeronautics and Space Administration (NASA) to enter into discussions with the goal of reaching an interagency working agreement to make NASA's energy expertise available to the Department.

## TITLE II—DEPARTMENT OF ENERGY MANAGEMENT

*Sec. 201. Improved coordination and management of civilian science and technology programs*

This section amends the Department of Energy Organization Act ("DOEOA") to require that the position of Director of the Office of Science established at section 209(a) of the DOEOA be elevated to an Assistant Secretary. The section also increases the overall number of Assistant Secretaries in the Department at section 203(a) of the DOEOA from six to seven, and expresses the Sense of Congress

that leadership for departmental missions in nuclear energy should be at the Assistant Secretary level.

*Sec. 202. Report on equal employment opportunity practices*

This section requires the Secretary transmit to the Congress a biennial report on five aspects of the equal employment opportunity practices at the nonmilitary energy laboratories.

*Sec. 203. External regulation of Department of Energy*

This section terminates the Department's authority to self-regulate its nuclear and worker safety at non-military energy laboratories. It transfers regulatory and enforcement authority to the NRC and OSHA. It also prevents the delegation of that authority to the States. In addition, it shields contractor operators from bearing the costs of decommissioning a facility and directs the Department to establish decommissioning procedures for its nonmilitary energy laboratories.

### TITLE III—CLEAN SCHOOL BUSES

*Sec. 301. Establishment of pilot program*

This section requires the Secretary to establish a program to demonstrate the use by local school districts of alternative fuel and ultra-low sulfur diesel school buses. Not less than 20 percent or more than 25 percent of funding under the section shall be for the demonstration of ultra-low sulfur diesel school buses.

*Sec. 302. Fuel cell bus development and demonstration program*

This section requires the Secretary to establish a program to enter into cooperative agreements for the development and demonstration of fuel cell-powered buses. Cost sharing under this provision is specified with regard to infrastructure and demonstration activities.

*Sec. 303. Diesel retrofit program*

This section requires the Secretary and the Administrator of the EPA to establish a pilot program for awarding grants to eligible recipients for the demonstration and commercial application of retrofit technologies for ultra-low sulfur diesel school buses.

*Sec. 304. Authorization of appropriations*

This section authorizes a total of \$300 million for the title III program for fiscal years 2004–2006.

### TITLE IV—ALTERNATIVE FUELED AND ADVANCED VEHICLES

*Sec. 401. Definitions*

This provision amends the Energy Policy Act of 1992 (42 U.S.C. 14 13211) to provide definitions for alternative fueled vehicles, and fuel cell, hybrid, neighborhood electric, and ultra-low sulfur diesel vehicles. It also defines the pilot program.

*Sec. 402. Pilot program*

This section requires the Secretary to establish a competitive grant program to provide not more than 15 geographically dispersed demonstration projects for state and local governments or metropolitan transportation authorities. Grants can be utilized for the demonstration of alternative fueled vehicles, fuel cell vehicles, hybrid vehicles, ultra-low sulfur diesel vehicles and infrastructure associated with alternative fueled, fuel cell and hybrid vehicle projects. The section imposes several additional requirements on grants and imposes selection criteria that give priority consideration to projects which maximize protection of the environment, demonstrate that projects will be maintained or expanded after initial federal funding, and enable the transfer of goods or passengers to other transportation systems. Grants under the demonstration program are subject to 50 percent cost sharing requirements and a maximum period of five years. The Secretary is also required to seek broad geographic distribution of projects and to transfer information and knowledge gained through projects to other interested parties.

*Sec. 403. Reports to Congress*

This section requires the Secretary to issue a report to Congress on grants as well as evaluations of the effectiveness of the program.

*Sec. 404. Fuel cell transit bus demonstration*

This section requires the Secretary to establish a transit bus demonstration program to demonstrate not more than 12 fuel cell transit buses (and necessary infrastructure) in three geographically dispersed localities.

*Sec. 405. Authorization of appropriations*

This section authorizes \$200 million to carry out title IV, to remain available until expended.

## TITLE V—CLEAN COAL

*Sec. 501. Authorization of appropriations*

This section authorizes \$1.8 billion for a Clean Coal Power Initiative at the Department for fiscal years 2003–2011. Section 501 also requires that the Secretary transmit a report, including a ten-year research plan, to Congress regarding certain implementation activities. Certain funding restrictions apply if the Secretary fails to transmit the report to Congress by September 30, 2005.

*Sec. 502. Project criteria*

This section establishes technical criteria that are to be required for projects funded under the Clean Coal Power Initiative. It also requires that the Secretary set technical milestones specifying the emissions levels that projects must be designed to and reasonably expected to achieve. The section requires that, through fiscal year 2009, no less than 80 percent of funding be provided only to projects involving coal-based gasification technologies. Beginning in 2009, the Secretary may, upon congressional notification, select projects that do not meet the 80 percent gasification requirement

if they offer greater emissions reductions and permit carbon separation and capture. The section also specifies financial criteria for the program.

*Sec. 503. Report*

This section requires the Secretary, in consultation with other appropriate agencies, to transmit a report to Congress on the technical milestones and the status of projects funded under title V no later than one year after the date of the enactment of the title, and once every two years thereafter through 2011.

*Sec. 504. Clean Coal Centers of Excellence*

This section requires the Secretary to award competitive, merit-based grants to universities for the establishment of Centers of Excellence for Energy Systems of the Future. It also requires that the Secretary provide grants to universities that can show the greatest potential for advancing new clean coal technologies.

## VIII. COMMITTEE VIEWS

*Sec. 106A.—Electric motor control technology.* The Committee is aware of the potential of optical/graphical programming for driving, controlling, and improving virtually all types of electric motors. Successful development of a simple, low cost, and generic solution for the intelligent control of electric motors could significantly improve their energy efficiency. Such technology could have tremendous impact on the HVAC industry, among others.

DOE, through the Office of Industrial Technologies, has already invested in several promising energy efficient technologies, including the development of an optical programming system for intelligent control of electric air conditioning motors. From 1999–2002, the New York State Energy Research and Development Authority (NYSERDA) also invested significantly in an optical programming technology to improve the efficiency of HVAC motors. DOE program staff from the National Renewable Energy Laboratory (NREL) have reviewed this electric motor control, optical programming technology and concluded that successful implementation of the technology could lead to significant improvements in HVAC efficiency.

Consequently, the Committee encourages DOE to fund larger demonstrations through its Building Technologies Program, Zero Energy Building Program or other programs to encourage the commercial application and wider acceptance of electric motor-control technology. As part of this effort, the Committee instructs DOE to work with NYSEERDA to include this technology as part of a wider demonstration of energy efficient technology in institutional settings such as schools for grades K–12.

The Committee has also included language directing the Secretary to conduct additional research, development, demonstration, and commercial application of this technology. The Committee intends that the Secretary fund promising applications by small businesses that have special expertise in this area.

*Sec. 110A.—Advanced energy technology transfer centers.* The Committee is aware that viable commercial technologies and best practices for utilizing energy efficiency in buildings and industrial processes have been developed in DOE laboratories and in the pri-

vate sector. These technologies are currently available, but often lack sufficient market penetration and adoption to have substantial impacts on energy use. This is due not only to a lack of incentives for their use, but to the lack of exposure to building and energy professionals that would most benefit from these applications. Restructuring of power markets has left utilities that supported demand-side energy efficiency technologies with little financial incentive to continue programs that were designed to promote these technologies.

Subsection (a) of Section 110A authorizes the establishment of a national network of regional centers to provide training and demonstration of clean, energy efficient technologies and methods developed in both DOE laboratories and by private firms. The Committee intends that the centers be located to serve all regions of the country, while siting the centers based on greatest need.

Subsection (b) generally prescribes the primary functions and capabilities of the centers. Specifically, these centers should operate an extensive outreach program providing information, training and technical advice to a wide audience of building and industry professionals, technicians and organizations responsible for energy demand.

The Department will serve as a central coordinating body for the activities of the network of regional centers. In this capacity, the Department will be responsible for the dissemination and transfer of information among the regional centers, scheduling of televised classes and demonstrations, and will be the developer of curricula for the network and aggregator of findings, solutions and technologies developed through the regional centers, among other duties.

*Sec. 111A.—Demonstration and field test.* The Committee is aware that the Energy Efficiency Subcommittee of the President's Council of Advisors on Science and Technology (PCAST) has endorsed a demonstration and field test of distributed generation systems to focus on the communications and control challenges that may result from the widespread adoption of these systems. To define technical needs, the field test should address interconnection reliability and safety issues for a range of generator sizes and types, applications, and locations on the system. The test should identify the full costs of distributed generation to the system. The Committee is particularly interested in the use of distributed generation systems in areas of low-density population. It is in areas such as these, with their special cost structures and widely distributed consumption bases, that experts believe distributed generation offers the greatest promise for providing efficient, reliable electricity. The Committee asks the Secretary to work with rural electric cooperatives—both national organizations such as the National Rural Electric Cooperative Association and state associations representing the rural electric cooperatives—in shaping this demonstration and field test to meet the special needs of the communities they serve.

*Sec. 112.—Strategy.* The Committee draws on recommendations from the PCAST Report on Energy Efficiency (2002) to increase Federal research and development in communication and control technology for distributed generation systems. Through communications networks, these technologies allow distributed generation

units to respond in real-time to fluctuations in market prices and grid demand by increasing production when grid demand and market prices are high and decreasing production when power from the grid is more economical.

*Sec. 113.—High power density industries.* Section 113 requires the Secretary to develop and implement a comprehensive RD&D and commercial application program to improve energy efficiency, reliability, and environmental responsibility in high power density industries, such as data centers, server farms, and telecommunications facilities. In carrying out this section the Secretary shall consider technologies that provide significant improvements in thermal controls, metering, load management, peak load reduction or the efficient cooling of electronics.

*Sec. 114.—Micro-cogeneration energy technology.* Section 114 is intended to help realize the potential of cogeneration technology as a clean source of energy for a variety of applications. Many believe the residential furnace industry is often overlooked in the development of such distributed cogeneration systems. The Committee believes that, with further research and development, cogeneration of electric power as a byproduct of residential building heating system operation could provide significant environmental benefits at low cost and high reliability and that the residential heating appliance industry is uniquely positioned to provide reliable electricity using environmentally friendly cogeneration power with practical technology.

The Committee believes the DOE Office of Energy Efficiency and Renewable Energy has adequate resources within its current budget to begin modest funding of micro-cogeneration energy technology research under this section. This is consistent with the spirit of a floor colloquy between the Chairman of the House Committee on Science and the Chairman of the House Appropriations Subcommittee on Interior and Related Agencies during the debate over the fiscal year 2003 Interior Appropriations legislation. The Committee expects DOE to release a micro-cogeneration R&D solicitation within a few months after enactment of this Act.

*Sec. 117—Voluntary consensus standards.* The Committee and the Congress, through the National Technology Transfer and Advancement Act of 1995 (PL 104–113), have established the legal requirement that agencies must work with standards development organizations in the development of standards in technological areas of importance to each agency. Furthermore, the Act states that voluntary consensus standards, to the extent practicable, are to be used for procurement and regulatory purposes. The Committee feels that the development and widespread adoption of voluntary consensus standards for obtaining electricity from, or providing electricity to, distributed energy systems for use in manufacturing and for using equipment and systems for connection with electric distribution systems is a prime example of an area where the Act applies. The Committee commends the IEEE for its years of work, in conjunction with other standards development organizations, on distributed energy system standards and urges the Secretary, in consultation with the NIST, to take such steps as may be necessary to permit IEEE to complete the development, approval, and promulgation of these standards. The Secretary should also promote the widespread use of these standards with the goal

of bringing predictability and standardization to the companies who choose to do business in this emerging energy area.

*Sec. 121.—Renewable energy.* The Committee is supportive of DOE's research and development programs in wind energy generation located in Washington state. A continuing DOE commitment is important to bring about the commercialization of worthwhile projects through the regional field verification program. The Committee is supportive of establishing a wind energy demonstration site in the state of Washington, not only to accommodate the continued population and industrial growth of the Pacific Northwest, but also to gain knowledge to meet the incremental power needs in areas of the country where wind can be effectively utilized.

*Sec. 122.—Bioenergy Programs.* The Committee is aware of research at a biofuels processing facility in New York to convert cellulose materials into levulinic acid for multiple applications. As part of this work, the State University of New York College of Environmental Science and Forestry is developing a Bioenergy and Bioproducts Technology Center, focusing on biofuels from lignocellulosic biomaterial.

The Committee strongly encourages the Secretary to consider providing substantial financial assistance for this biofuels proposal. The Committee also intends that section 122 authorize the Secretary to provide assistance for an integrated rice straw project in Gridley, California, to convert rice straw into ethanol, electric power, and silica, and an ethanol production facility in Maryland to convert barley grain into ethanol for use in motor vehicles or other uses.

*Sec. 127.—Renewable energy in public buildings.* This section establishes a DOE grant program for local and state governments that plan to deploy solar and other renewable energy source technologies in public buildings that they own or operate. The grants can provide up to 40 percent of the incremental cost of the renewable energy project. The Committee believes this program is a key way for DOE to be a financial partner with state and local municipalities that are committed to the long-term and expanding use of renewable energy technology as part of its energy infrastructure. For instance, Sebastopol, California, in conjunction with staff and students at Sonoma State University's Department of Environmental Studies and Planning, has developed a plan to use solar technology in Sebastopol's residential, commercial, and municipal buildings, with the eventual goal to completely transition the city to solar energy.

*Sec. 134.—University nuclear science and engineering support.* This section authorizes new and existing programs to promote university research and education in nuclear engineering. The Committee is aware of concerns within the university nuclear research reactor community that DOE may be considering reducing its support for numerous university reactors. The Committee urges the Department to continue to maintain, and even expand, its support of the existing research reactor infrastructure. The Committee believes that a sustainable approach to nuclear power must include ongoing support for nuclear research reactors throughout the various regions of the United States.

*Sec. 135.—Geological isolation of spent fuel.* The transportation of spent nuclear fuel faces increasing opposition from citizens who

live on or near transportation routes that are expected to be used for transporting the fuel. An option for disposal of nuclear waste may be to bury it in deep holes bored into crystalline rocks. Surveys indicate that there are many appropriate sites located near existing reactors throughout the U.S. that could reduce the volumes of fuel needing to be hauled long distances. The Committee is supportive of examining the cost and technical feasibility of this deep borehole technology to determine its suitability as a means of disposal of spent fuel from the nation's nuclear power reactors.

*Subtitle E—Fossil Energy: Part 3—Ultra-Deepwater and Unconventional Natural Gas and Other Petroleum Resources.* Part 3 authorizes a new, seven-year program at the Department for research, development, demonstration, and commercial application of ultra-deepwater and unconventional natural gas and other petroleum exploration technologies. For purposes of this program, ultra-deepwater is defined to be in excess of 1,500 meters below the surface of the ocean. The Committee is hopeful that this technology will enable the U.S. to increase the supplies of oil and gas from the central and western Gulf of Mexico and other areas already open to drilling. The Department is to carry out the program through a non-profit research consortium, modeled on the highly successful example of SEMATECH, which guided jointly funded efforts of the Department of Defense and the semiconductor industry. The Committee intends that the Secretary exercise continuing oversight over the research consortium. It is the Secretary's responsibility to ensure that the public interest is being served by the consortium's projects, that the projects are making the desired technical progress, and that the public's money is being properly spent. Part 3 also requires annual audits by an independent, outside auditing firm. Such audits were also required of SEMATECH.

Section 145(a) requires that all the projects undertaken under this program have among their major goals the improvement of safety and the limiting of environmental impacts. The Committee expects the Secretary to carefully monitor the program to ensure that safety and environmental impacts are specifically addressed in the projects funded through the consortium.

The ultra deep program of RD&D would be applicable only in certain areas. Section 144(c) prohibits field activities under the program authorized by this Part in any offshore areas that are currently under federal moratoria, such as areas off the coasts of California or North Carolina.

*Sec. 147.—Additional requirements for awards.* This section sets specific requirements for awards, including specification of commercial use of technologies, standards for intellectual property, the circumstances under which cost-sharing might be reduced, and the need for technology transfer activities as part of each award. The Committee expects the Department to make every effort to include companies and independent producers of oil and gas that have had less than \$500 million in annual revenues over the last three years. The requirements in section 147(c) are not intended by the Committee to affect existing requirements of the Bayh-Dole Act in any way. Section 147(e) provides the Secretary with authority to reduce cost sharing to not less than 10 percent of project costs. The Committee expects that such reductions in cost sharing would be for a period not to exceed two years.

*Sec. 150A.—Transfer of advanced oil and gas exploration and production technologies.* The Federal government, particularly the Navy, has spent decades developing technologies designed to operate in harsh marine environments. In some cases the government is ahead of the industry in developing these technologies that have yet to be fully utilized in the private sector. The Committee encourages the Department to review technologies within the government that may be suitable for use in the industry-led ultra-deep exploration, production, and development program. The section further requires the Secretary to seek out and select the most competent organization to manage technology transfer activities through a competitive solicitation.

*Sec. 161.—Science.* The Committee is aware that, in an October 2002 report, PCAST's Subcommittee on Federal Investment in Science and Technology and its National Benefits observed:

All evidence points to a need to improve funding for physical sciences and engineering. Continuation of present patterns will lead to an inability to sustain our nation's technical and scientific leadership. \* \* \* Lack of funding in these \* \* \* disciplines is cause for concern for a number of reasons: [The number of both full-time graduate and Ph.D. students in most physical sciences, math and engineering are decreasing. \* \* \* Facilities and infrastructure in general for the physical sciences are becoming less than adequate for the needs of today's research problems. It is widely understood and acknowledged that the interdependence of the various disciplines requires that all advance together.

H.R. 238 therefore includes a significant budget increase for DOE's Office of Science, because of its primary importance to the physical sciences and to the science community in general. Unique among civilian science agencies, the Office of Science is responsible for operating specialized user facilities and supporting large teams of scientists capable of tackling large-scale, complex, multi-disciplinary problems that are national priorities in scientific research, such as nanotechnology. For more than a decade, however, Office of Science budgets have stagnated or declined. The increase recommended in this bill would reinvigorate these programs and assure America's continued scientific leadership.

The decline in the number of physical science and engineering degrees awarded to U.S. citizens is well documented and a cause for concern, even alarm, given the requirements of our economy and the shortage of technical personnel to fulfill them. The Committee notes, further, that the growth in expert personnel abroad, combined with the diminishing numbers of Americans entering the physical sciences, mathematics and engineering—an unhealthy trend—is leading corporations to locate more of their R&D activities outside the United States.

The Committee also recognizes that research conducted by universities is vital to the success of the Office of Science program and that the training of a national workforce skilled in a wide variety of physical science disciplines, including computing and engineering is essential. Approximately one quarter of the Office of Science budget supports competitive, merit-reviewed grants to about 2,000

individual investigators at more than 250 universities and institutions nationwide. Although it is the prime supporter of the physical sciences and is responsible for a major share of university research in these fields, DOE is able to fund only 10 percent of the grant applications it receives. Even in a priority area such as nanotechnology, DOE is able to fund only 13.5 percent of submitted applications. By comparison, the National Science Foundation (NSF) was able to fund 31 percent of grants submitted in 2001. As a result, a far greater proportion of good ideas in the physical sciences are unlikely to be pursued.

*Sec. 161A.—ITER.* Although the challenges and uncertainties associated with the development of practical fusion energy are significant, the Committee recognizes the reward for success is great: a safe, environmentally attractive and virtually unlimited base-load power source.

The Committee also recognizes that U.S. magnetic fusion research has reached a major milestone. As the result of substantial progress in fusion research over the past several years, the U.S. fusion research community has developed a strong consensus that magnetic fusion is ready to take the next step toward fusion energy: a burning plasma experiment. Several outside reviewers including the National Research Council have echoed this conclusion. Further, the consensus within the fusion community is that as a first choice, the U.S. should satisfactorily conclude negotiations leading toward the construction of an international burning plasma research project—the ITER project. The preponderance of the international fusion community, including the European Union, Japan, Russia, Canada, China and most recently South Korea, is moving forward with negotiations over the financing and the location of the ITER project. The second choice would be a domestic burning plasma device.

H.R. 238 authorizes U.S. participation in the ITER project if certain prescribed conditions are met. The bill's conditions for ITER participation are meant to reflect lessons learned from U.S. participation in other major domestic and international science projects: there must be cost protections; the U.S. role must be clearly defined; the U.S. must share equitably in experimental design, operations and collective decision making; the collaboration must maximize benefit to the U.S. domestic fusion program; and there must be a reasonable exit strategy for U.S. participation. The authorization also calls for the Secretary to submit to Congress its plan for U.S. participation in ITER prior to any U.S. contribution being made toward ITER construction. The Committee wants to ensure that Congress will have ample time to review the final decision to join the ITER project after the negotiations are complete and DOE has submitted its reports.

Regardless of whether ITER goes forward, the U.S. fusion energy sciences program must be strengthened. This strengthening is necessary to revitalize a program that faces increased demands to utilize existing experiments more fully, increase its scientific and computational base, diversify its lines of enquiry in terms of innovative approaches to fusion, and maintain its place as a world leader in the face of European and Japanese programs of much greater size. Hence, the Committee authorizes increased funding for domestic fusion energy sciences program for the next four fiscal years.

Finally, it is the Committee's view that a strengthened domestic fusion research program is critical for participation in ITER. Therefore, the Committee has included separate authorizing levels for the initial four years of ITER participation in order to emphasize that funding for U.S. participation in ITER should complement, not compete with the U.S. domestic fusion program. An attempt to partially or wholly fund ITER at the expense of the U.S. domestic fusion program could result in a weakened domestic fusion program that would be unable to fully utilize or leverage the value of participation in ITER.

*Sec. 167.—Facility and infrastructure support for nonmilitary energy laboratories.* The DOE supports the operation of major scientific user facilities such as synchrotron light sources for the national scientific and technological community. Of the increased funding authorized for the Office of Science, the Committee recommends that the DOE increase the budgets for operations and maintenance of the Office's user facilities to maximize their operation and run times. These budgets have not increased substantially since 1980 even as key infrastructure has aged and now requires additional maintenance. In many cases the scientific output and accessibility of these facilities is impaired by inadequate operations budgets and lack of funds for appropriate upgrades.

*Sec. 169.—Nanotechnology research and development.* The Committee supports a comprehensive DOE program of research, development, demonstration and commercial application in nanotechnology including support for new DOE nanotechnology facilities. The Committee anticipates that many benefits will be realized as new materials and products emerge through the pursuit of nanotechnology research. However, the Committee notes that new technologies also can produce unintended negative consequences. Therefore, as part of this program, the Committee intends the research funded under Section 169(b)(5) to explore the societal and ethical implications of the technologies that may be developed through research on nanotechnology.

The commitment of resources to study the broad range of societal and ethical issues will provide opportunities to ensure that the technological developments in this field are examined in terms of their implications for the betterment of individuals and of all of society. Public support for nanotechnology research and development and public acceptance of the products derived from it will be enhanced through proactive, reasoned consideration of the potential impacts of the new materials and technologies.

The program is intended to provide opportunities for interdisciplinary work between scientists developing these technologies and social scientists and ethicists. Through the work undertaken in this program, enhanced communication can occur between social scientists and technology developers at an early stage in the research and development process. The Committee notes that this program is analogous to the Ethical, Legal, and Social Implications (ELSI) Research Program that has been a part of the Human Genome Project since 1990. Studies of environmental and societal consequences should include research on the potential environmental consequences of nanotechnology and the potential toxic effects of nanotechnology materials, and the ability for nanotechnology materials to persist and be transformed after they are introduced into

the environment. This type of information may make it possible to improve the lifecycle design of existing and new products.

The projects funded through this program should address the potential implications of using nanotechnology for “non-biological intelligence.” Examples of non-biological intelligence might include applications to enhance human performance, both physically and intellectually, beyond what is generally considered to be the normal range, or aiding artificial intelligence by using nanotechnology to scan the human brain from the inside, and guide computer engineers in the development of computational devices modeled after the human brain. Some experts warn, however, that nanotechnology could lead to the creation of ultra-fast, efficient computers with computational and self-analytical, problem-solving abilities that may surpass the ability of humans to monitor or control them. The projects funded through this program should address these and other social, environmental and ethical issues associated with nanotechnology applications. The Committee wants DOE to ensure, however, that this research does not duplicate NSF- or EPA-funded efforts in these areas.

*Sec. 170A.—Nitrogen fixation.* Research activities leading to the development of crops with enhanced biological nitrogen fixation capability have the potential to dramatically reduce natural gas demand. The primary input required for nitrogen fertilizer production is natural gas; in fact, fertilizer manufacturing consumes about 6 percent of all U.S. natural gas production. Research advances in nitrogen fixation will lead to reduced energy demand and agricultural input costs for farmers while also providing environmental benefits through reduced reliance on chemical fertilizers.

*Sec. 170C.—Department of Energy Science and Technology Scholarship Program.* The Committee is greatly concerned about the ability of DOE to attract and retain the scientific and technical personnel it needs to effectively administer its programs. H.R. 238 contains a provision that the Committee intends and expects to result in the award of scholarships for talented young scientists pursuing graduate degrees in scientific and technical disciplines of importance to DOE. Students participating in this program will receive scholarships in exchange for a commitment to work at DOE upon completion of their degrees. The Committee believes that this program will provide an important tool for recruiting talented young scientists to government service.

*Sec. 178.—Fuel cell test center.* The Committee is supportive of the establishment of a fuel cell test facility for the next-generation of fuel cells. These fuel cells are expected to need a large and continuous source of hydrogen to operate effectively. The Department should examine possible sites where hydrogen is available by pipeline, rather than delivered to the site by truck, and where access to electric transmission systems is available, especially for the testing of stationary fuel cells for electric power generation. Some universities such as Lamar University are especially qualified to operate these facilities and the Department is encouraged to look for suitable university partners through the course of the study.

*Subtitle H—Hydrogen.* The Committee has long been involved in hydrogen research, development, demonstration and the commercial application of hydrogen-related technologies. The Committee authorized hydrogen science and technology programs in the origi-

nal Spark M. Matsunaga Act of 1990 and Hydrogen Future Act of 1996. During the conference on comprehensive energy legislation in the 107th Congress (H.R. 4), the Committee negotiated language with the Senate conferees on amending the Matsunaga and Hydrogen Future Acts, which is reflected in H.R. 238 as introduced. At markup, the Committee revised the Hydrogen Subtitle to reflect two Presidential policy initiatives—the FreedomCAR program, announced in 2001, which redirected Federal automotive R&D to place greater emphasis on advanced vehicle technologies using hydrogen and fuel cells, and the new Hydrogen Fuel Initiative, which the President announced in his State of the Union address in January.

The Committee strongly supports the President's commitment to hydrogen, but is particularly intent that the President's FreedomCAR and Hydrogen Initiatives address the following areas:

1. Stationary Power Generation.—The President's Hydrogen Initiative has a clear focus on hydrogen fuel cell vehicles and the infrastructure to support them. Such vehicles hold potentially enormous benefits for the Nation, in terms of improved energy efficiency, near zero emissions, and reduced dependence on foreign oil. However, stationary applications face fewer technical barriers before becoming commercially viable, especially in niche market applications. The Committee strongly encourages the Department to support stationary fuel cell research, which will lead to technology advances applicable to fuel cell vehicles.

2. Meaningful Demonstrations.—Past efforts by the Department to demonstrate technologies have not always been successful in providing reproducible models for commercial applications. As the Department demonstrates hydrogen and fuel cell technology, the Committee urges the Department to choose applications that have value in the commercial market, and can be easily reproduced, rather than one-of-a-kind examples that do not advance the technology's acceptance. The bill requires meaningful demonstrations, such as placing the technology into an existing facility, for example placing a stationary fuel cell into critical telecommunications switching stations, which require uninterruptible power.

3. Integration of Policy into the Research Plan.—The Committee expects the research plan to explicitly state the specific policy assumptions that are guiding the development of the R&D agenda. While the Committee understands that the Department cannot yet be sure exactly what policies will be put in place to facilitate the transition to a hydrogen economy, DOE cannot put together an R&D agenda without making some assumptions about the future policy environment. For example, the mix of sources we choose to tap for hydrogen (coal, natural gas, renewables, etc.) will be greatly affected by government policy (air regulations, tax incentives, and so forth). The way those sources are used will also be affected by government policy. (For example, will carbon sequestration be required in the production of hydrogen?) Since DOE's R&D agenda must facilitate the development of technologies that can be put to work in a relatively short time in "the real world," DOE's decisions about R&D investments must take into account how that world will be shaped by government policy.

4. Report and Review.—The Committee commends the Department on the National Hydrogen Vision and Roadmap, especially

the involvement of stakeholders and the long-term planning those documents embody. The Committee directs the Department to continue developing a research plan, and gives specific details the Department must consider in section 105. The Committee looks forward to working with the Department as it develops the research plan. Section 109 also requires the Department to engage a non-federal entity, such as the National Academy of Sciences, to review the plan after it is developed, and review the program and its progress biennially thereafter.

5. Coordination.—Although the majority of the President’s initiative will be located in the Office of Energy Efficiency and Renewable Energy, it is the intention of the Committee that the Department conduct all hydrogen and fuel cell work in a coordinated manner to prevent duplication and provide maximum benefit. The Committee strongly encourages the Department to involve the Office of Science in areas of basic research relevant to the program. Additionally, the Committee notes that four separate sections of the bill authorize fuel cell RD&D and commercial application: section 142 (c) in fossil energy, section 182 amending the Matsunaga Act, section 302 pertaining to fuel cell school buses, and section 404 pertaining to fuel cell bus demonstration programs. The Committee intends that the Secretary coordinate implementations of these provisions to maximize their integration and effectiveness.

The Committee intends that the term “overall” in section 103 (a)(3) indicate that the complete life-cycle, or “well-to-wheels”, efficiency and environmental costs be considered as the Department is considering various technology options for the production, delivery, and use of hydrogen.

*Sec. 196.—University collaboration.* The Department has a large number of grants, contracts and cooperative agreements with universities. Many of them are with some of the largest universities in the country. The Committee is interested in encouraging greater participation in DOE programs by smaller colleges and universities, especially minority-serving institutions. The Committee also believes that the considerable talents and expertise that reside in these smaller institutions can be more effectively utilized through collaborations or other teaming arrangements with large universities. The Department is encouraged to examine appropriate ways to promote these types of arrangements for the benefit of the Department and the university community.

*Sec. 197.—Federal laboratory educational partners.* Section 197 amends the Stevenson-Wydler Act to add support of science education activities to the list of permissible uses for the revenues Federal laboratories receive from their inventions. The Committee feels that Federal laboratories, especially DOE’s National Laboratories, with their high concentrations of scientists and engineers, are uniquely positioned to aid surrounding communities in improving the learning experience of their students. For instance, DOE’s National Renewable Energy Laboratory initiated the Coalition for Learning Opportunities and United Tutors (CLOUT) program in 1998 activities, using funds provided by private sources, including funds from companies that operate the lab to match volunteers with students in 17 Denver public schools. It is the hope of the Committee that a portion of this royalty stream can be used to expand laboratory educational outreach and to provide scientists and

engineers as role models to students who might not otherwise cross paths with adults with these backgrounds.

*Sec. 198.—Interagency cooperation.* Several Federal agencies, including NIST, DOE, and NASA, have recently formed the Government Agencies Technology Exchange in Manufacturing (GATE—M) program to improve the exchange of information concerning technical programs and to collaborate for enhanced payoffs from federal investments. These agencies have recognized the need for improved flow of information and technology among agencies and out to the private sector. The Committee expects that DOE and NASA will use GATE—M as a model for interagency collaboration, utilizing NASA technical expertise and research to enhance commercial development and technology transfer programs and to improve U.S. industry competitiveness in producing solar, wind, fuel cell, and hydrogen energy products.

*Sec. 202.—Report on equal employment opportunity practices.* This section directs the Secretary to transmit a biennial report on equal employment practices at non-military energy laboratories. The Committee expects the Secretary to deliver the first of these reports within 12 months of the date of enactment of this Act.

*Sec. 203.—External regulation of Department of Energy.* The Committee has monitored the debate on external regulation since the late 1980s. In 1999, the Energy Subcommittee of the Committee on Science held a hearing on the Department's original set of pilot projects at which DOE, NRC, OSHA and the General Accounting Office (GAO) testified. The witnesses testified that those pilot projects demonstrated the feasibility of ending the Department's self-regulation of nuclear safety and worker safety and health. The Committee is convinced that this reform, if properly implemented, would keep the labs safe and save the taxpayers money.

This provision would require the Department to end its self-regulation of nuclear and worker safety and health within 24 months of the enactment of this Act. The responsibility for regulating nuclear safety will be assumed by the NRC; the responsibility for regulating worker safety and health will be taken up by OSHA.

Currently, DOE is unique among Federal agencies in that it self-regulates nuclear and worker safety and health at its facilities. Work by the GAO strongly suggests that the Department is an inefficient regulator at best. The GAO also reported that Lab directors representing the five multi-program science labs indicated that they could reduce or redirect their safety and health (S&H) staff by up to 30 percent with external regulation. GAO also found that Battelle, which manages three of the Department's labs, spends one-half to one-third less on S&H at its externally regulated private-sector labs. According to DOE's 2002 Best Practices Pilot Study, in comparison with similar NASA and NSF-funded facilities, the Department appears to use notably more resources in S&H with no demonstrable gain in safety.

One negative consequence of self-regulation is that workers who may face unsafe conditions may be cowed into not reporting those conditions due to fear of retaliation. The Department and its contractors are put in the unenviable position of being seen to have a conflict-of-interest between carrying out their missions and correcting working conditions that may be unsafe. Removing the De-

partment from the business of regulating itself would improve this situation, creating a safer environment in the labs. Further, it will improve the credibility of the labs with the communities that house those labs. It is the Committee's view that such apparent conflicts of interest would be less likely to develop if credible outside regulatory agencies—OSHA and NRC—were involved in regulating the labs.

There will be costs involved in a transition to external regulation; however, Departmental estimates on the costs have been unreliable. An estimate by the labs suggested compliance costs (that is, bringing the complex up to the regulatory standards of OSHA and the NRC) would be on the order of \$75 million. In addition, the labs anticipate some \$200 million will be required for decontamination and decommissioning of old, unused science facilities to comply with NRC guidelines. GAO estimates that, if the Department dramatically changes its approach to safety and health oversight, relying instead on industry norms for risk management as is done by NASA, an agency with a comparable science laboratory, safety and health costs could be reduced by up to \$41 million each year. We anticipate that some proportion of the savings will actually go to more scientific study in the labs while some proportion will be reflected in smaller appropriations for the Department. Uncertainties regarding cost led the House Appropriations Energy and Water Subcommittee to direct the Department to work with the NRC and OSHA on a compliance audit of the ten labs. The audit is to be completed by April 30, 2004. We encourage our colleagues on the Appropriations Committee to provide funds sufficient to complete the work necessary to bring the complex up to code.

Both NRC and OSHA will require additional funding for annual training and will have annual personnel costs, estimated to be \$6.9 million a year. The Committee encourages these agencies to budget for these tasks beginning with their fiscal year 2005 submission. The Committee looks forward to closely monitoring and reviewing all transition plans prepared by the DOE, OSHA or the NRC. In addition, the Committee strongly recommends both the NRC and OSHA show maximum flexibility in applying their regulatory standards to the Department's lab complex. In exercising this flexibility, NRC and OSHA should recognize DOE's expertise in the operation and maintenance of unique facilities and equipment and avoid undue interference with their scientific missions. In all cases, we ask NRC and OSHA to provide adequate time for the laboratories to comply with its regulations.

In carrying out the provisions of this title, the Secretary is directed to follow the guidance provided by GAO regarding management reform in external regulation. It is not the Committee's intent to see dual regulation continue—that is, the Department maintaining its current level of effort overseeing the labs' nuclear and worker safety and health programs—nor does the Committee intend that S&H standards be weakened in any way. Rather, the Committee expects the Department to adopt bold, new, efficient management techniques to save taxpayer money and allow the labs to do the work the Congress funds them to do: world-class science.

The 1997–1999 pilot program demonstrated that the contractors must hold licenses if significant cost savings are to be realized. It is for this reason the Committee requires this licensing in Section

202(b)(2). The DOE report to Congress should clearly indicate the roles of OSHA and NRC, and demonstrate DOE's close cooperation with the agencies as they develop a plan for transition to external regulation. The Committee also directs GAO to track the Department's progress and ensure cost saving reforms are made so that S&H standards can be carried out in the most intelligent and efficient manner possible.

*Sec. 303.—Diesel Retrofit Program.* The Committee recognizes the clear benefits to the health of children who ride school buses of retrofitting those buses made in 1991 and later model years with emissions control technology, particularly newer diesel emissions control technology, if it can be demonstrated to be reliable. The Committee recognizes the effort of EPA, and directs the Secretary to work closely with the Administrator of that agency.

*Sec. 402.—Pilot program.* In selecting applicants and project sites, the Secretary should, consistent with subsection 103(d)(1), give special consideration to proposals that address environmental needs in Clean Air Act nonattainment areas like the Washington, DC metropolitan region and in communities seeking to meet zero air emission goals, like Santa Clara County, California.

*Sec. 404.—Fuel cell transit bus demonstration.* This section directs the Secretary to establish a comprehensive public private partnership program to demonstrate hydrogen fuel cell transit bus technology. The Committee recognizes that fuel cell technology could significantly contribute to improving the cost effectiveness and environmental impact of mass transit options. However, more research and development work needs to be done to address a number of issues related to this technology. This demonstration program should specifically address numerous aspects of the introduction of this new technology, including consideration of the following components:

1. Design and production of the Polymer Electrolyte Membrane (PEM) fuel cell power plant, electric drive and other components and integration of the power plant system with the bus chassis;
2. Demonstration of system reliability and durability capable of meeting the initial mission requirements of transit bus authorities;
3. Design and development of a fuel cell friendly bus chassis that can become a standard platform for transit bus Original Equipment Manufacturers (OEM);
4. Transit bus infrastructure requirements such as hydrogen production, storage and distribution;
5. On-site demonstration of hydrogen production using: commercial and renewable, gaseous and liquid fuels, and water electrolysis coupled with a renewable energy source;
6. Design, development and demonstration of a hydrogen storage system;
7. Data collection, verification and testing, and information dissemination;
8. Identification and implementation of necessary codes and standards for the safe use of hydrogen as a fuel suitable for the transit bus application, including the PEM fuel cell power plant system and related operational facilities; and

9. Completion of fleet vehicle evaluation program by bus operators along normal transit routes, providing equipment manufacturers and transit operators with the necessary analyses to enable operation of hydrogen PEM fuel cell transit buses over a range of operating environments.

The Committee is aware that the Department of Transportation is currently developing and funding a number of Bus Rapid Transit (BRT) demonstration programs around the country. The Committee believes that the BRT program is structured in a way that would facilitate the execution of this fuel cell bus demonstration program, as well as reducing redundancy in interagency research, and recommends the Secretary consider coordinating this fuel cell demonstration with existing BRT initiatives where there is local support to do so. The Committee also recognizes that local organizations, such as the Houston-Galveston Area Council, are well equipped to assist the Federal government in demonstrating the benefits from research on fuel cell technologies used for low-emission mass transit vehicles.

*Title V—Clean Coal.* Like the Administration, the Committee believes that coal is likely to continue to be a significant source of electric power in the U.S. for years to come, given its domestic abundance. However, if that is to be the case, coal must become a far more efficient and cleaner fuel. Section 501 authorizes appropriations of \$200 million per year for fiscal years 2003 through 2011, for the Clean Coal Power Initiative (CCPI). Section 502 sets out project criteria, including technical milestones for reduced emissions and for improved thermal efficiency. The Committee notes that improvements in efficiency in existing plants will be necessary to keep them competitive. As such, the efficiency targets set out in Section 502(b)(4) for efficiency refer to changes in the total plant efficiency. For example, for coal of 7000 British thermal units per pound (btu/lb.), these targets require that plants would be expected to improve from 29 percent total plant efficiency to 33 percent total plant efficiency. Such improvements will require, among other actions, government investment in research, development, demonstration and commercial application of truly advanced coal technologies. Neither the taxpayers nor the coal industry will be well served in the long run if government investments are made in technologies that do not “push the edge of the envelope.” Moreover, a concerted effort will be needed to strengthen the management of clean coal programs.

With those concerns in mind, Title V places a number of requirements and restrictions on coal programs, particularly on the CCPI. First, the Committee requires a detailed report on how CCPI will be organized and implemented. The Committee is troubled that at Committee hearings in the last Congress, the Administration witness could explain neither how the \$2 billion figure was arrived at nor how the money would be spent. Given the priority the Administration has placed on the CCPI, the Committee will allow the Initiative to begin. However, no new projects will be allowed to be started as of October 1, 2005, unless the Administration has submitted the detailed report required by this Act.

The report must be specific in explaining how the \$2 billion figure was developed, the scope of the program, how the program will operate, what technical milestones will be established and how

they will be achieved, and how the program can be guided or informed by the successes and failures of past clean coal efforts. Section 501 requires that the report contain a number of specific components. First, the report must contain a detailed assessment of whether the aggregate funding levels provided under subsection (a) are the appropriate funding levels for that program. The Committee expects that this section will include an estimate of total number of demonstrations of a given class of technology that are necessary to prove acceptance of the technology by industry, the approximate risk and cost reductions likely from second and successive demonstrations, and how these changes in cost and risk should affect the program's industrial participants' willingness to cost-share.

Second, the legislation requires a detailed description of how proposals will be solicited and evaluated, including a list of all activities expected to be undertaken. The Committee expects that this section will include the relative weights of technical merit, of cost sharing, of the financial ability of the participant to complete the project, of the anticipated size of the target market, and other considerations factored into project evaluations. The Committee expects that this section will also include an evaluation of the market segments that each technology demonstrated in the program is intended for, the share of the overall coal power market of each technology and the share of the overall electricity market of each technology.

Third, the report must contain a detailed list of technical milestones for each coal and related technology that will be pursued. The Committee expects that this section will define the performance levels (especially emissions and efficiency criteria outlined in Section 502) that successive projects are anticipated to meet, and the timeline for project awards to meet each performance level.

Finally, the report must include a detailed description of how the program will avoid problems enumerated in GAO reports on the Clean Coal Technology Program, including problems that have resulted in unspent funds and projects that failed either financially or scientifically. The Committee expects that this section will include a detailed plan on contract mechanisms and enforcement to ensure that project partners with successful projects meet their obligations.

Subsection 501(b) provides that no new projects can be started after September 30, 2005, unless the Secretary has transmitted the report outlined in section 502 to Congress and Congress has had at least 30 days to review the report.

The biennial report mentioned in Section 503 can be submitted as a part of the annual report required by Public Law 99-190 in the Clean Coal Technology Program, provided that it includes all the information required by that law. The Committee expects that cost-sharing will continue to be an important tool for leveraging scarce Federal resources, and therefore expects that the Department will continue to use cost-sharing as a major factor in project selection, especially in regard to demonstration projects. As milestones are met in the program and technologies approach commercialization, the Committee expects an increase in the private contribution to the program. The Act also establishes strict environmental standards that projects must be designed to meet and rea-

sonably be expected to achieve in order to receive funding. Moreover, at least 80 percent of the funding must be devoted to projects related to gasification (which may include sequestration), because these are technologies that are furthest from development and promise the greatest environmental benefit among economically viable technologies, and, therefore, are the ones most deserving of government support.

The Committee intends that the Secretary set strict, achievable, specific environmental milestones to ensure that the projects comply with section 502. The environmental criteria in this Act, which are taken from industry's own technology roadmap, are not mere advisory guidelines. They are precise requirements that the program must be designed to meet.

The Committee intends that the efficiency requirements refer to generation efficiency and that the efficiency numbers apply to plants that are exclusively generating power. The Secretary should issue equivalent efficiency numbers for plants involved in the production of industrial chemicals or other activities.

The Act also sets strict financial criteria for participants in CCPI. These criteria are absolutely essential to the success of the program. The Committee intends that the Secretary require specific, written documentation and audits from the participants to meet the requirements of subsection 503(c). For example, a market should exist for the technology being demonstrated or applied, as evidenced by statements of interest in writing from potential purchasers of technology.

The Committee recommends that the Secretary consult with objective, outside experts in developing the report, including those from the National Academy of Sciences (who will eventually be reviewing the program, pursuant to section 187(e)) and GAO. The Committee also recommends that, in writing the report and carrying out the program, the Secretary consult with environmental groups and other environmental experts, the coal industry, the utility industry, and the coal equipment manufacturing industry.

*Sec. 504—Clean Coal Centers of Excellence.* This section directs the Secretary to provide grants to universities for the establishment of clean coal centers of excellence. Based on the Subcommittee on Energy's June 12, 2001 hearing on Clean Coal Technology and subsequent discussions and materials, the Committee strongly encourages the Secretary to consider as potential recipients Southern Illinois University, the University of Pittsburgh, Carnegie-Mellon University, and the Center for Electric Power at Tennessee Technological University.

#### IX. COST ESTIMATE

Rule XIII, clause 3(c)(2) of the Rules of the House of Representatives requires each Committee Report on a measure approved by the Committee to include: (1) an estimate by the Committee of the costs that would be incurred in carrying out the bill or joint resolution in the fiscal year in which it is reported and in each of the five fiscal years following that fiscal year (or for the authorized duration of any program authorized by the bill or joint resolution if less than five years); (2) a comparison of the estimate of costs described in subparagraph (1) of this paragraph made by the Committee with any estimate of such costs made by a government

agency and submitted to such Committee; and (3) when practicable, a comparison of the total estimated funding level for the relevant programs with the appropriate levels under current law. However, House Rule XIII, clause 3(d)(3)(B) provides that this requirement does not apply when 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 submitted prior to the filing of the report and included in the report pursuant to House Rule XIII, clause 3(c)(3). 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 submitted to the Committee on Science 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).

Rule XIII, clause 3(c)(2) of the House of Representatives requires each Committee Report that accompanies a measure providing new budget authority (other than continuing appropriations), new spending authority, or new credit authority, or changes in revenues or tax expenditures to contain a cost estimate, as required by section 308(a)(1) of the Congressional Budget Act of 1974 and, when practicable, with respect to estimates of new budget authority, a comparison of the total estimated funding level for the relevant program (or programs) to the appropriate levels under current law. H.R. 238 does not contain any new budget authority, credit authority, or changes in revenues or tax expenditures. Assuming that the sums authorized under the bill are appropriated, H.R. 238 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

U.S. CONGRESS,  
CONGRESSIONAL BUDGET OFFICE,  
*Washington, DC, April 15, 2003.*

Hon. SHERWOOD L. BOEHLERT,  
*Chairman, Committee on Science,  
House of Representatives, Washington, DC.*

DEAR MR. CHAIRMAN: The Congressional Budget Office has prepared the enclosed cost estimate for H.R. 238, the Energy Research, Development, Demonstration, and Commercial Application Act of 2003.

If you wish further details on this estimate, we will be pleased to provide them. The CBO staff contact is Julie Middleton.

Sincerely,

BARRY B. ANDERSON  
(For Douglas Holtz-Eakin, Director).

Enclosure.

*H.R. 238—Energy Research, Development, Demonstration, and  
Commercial Application Act of 2003*

Summary: H.R. 238 would authorize funding for various research activities at the Department of Energy (DOE) and the Environmental Protection Agency (EPA), and would change the way some of DOE's laboratories are regulated. The bill also would authorize

loan guarantees for new technologies. Assuming appropriation of the necessary amounts, CBO estimates that implementing H.R. 238 would cost a total of \$32.7 billion over the next five years and a total of \$36.7 billion over the 2004–2013 period. CBO estimates that enacting the bill would not affect direct spending or revenues.

H.R. 238 contains both an intergovernmental and a private-sector mandate as defined in the Unfunded Mandates Reform Act (UMRA) by effectively increasing the annual fees collected from Nuclear Regulatory Commission (NRC) licensees. However, CBO estimates that the fee increase would fall well below the annual thresholds established by that act over the next five years (\$59 million for intergovernmental mandates and \$117 million for private-sector mandates in 2003, adjusted annually for inflation). The remaining provisions of the bill contain no intergovernmental or private-sector mandates, and any costs borne by states would be voluntary or would result from conditions of federal aid.

Estimated cost to the Federal Government: The estimated budgetary impact of H.R. 238 is shown in the following table. The costs of this legislation fall within budget functions 250 (general science, space, and technology) 270 (energy), and 300 (natural resources and the environment).

	By fiscal year, in millions of dollars—					
	2003	2004	2005	2006	2007	2008
SPENDING SUBJECT TO APPROPRIATION						
Spending for Certain Energy R&D Under Current Law:						
Budget Authority <sup>1</sup> .....	5,251	0	0	0	0	0
Estimated Outlays .....	5,044	2,722	571	146	47	0
Proposed Changes:						
Specified Authorizations:						
Authorization Level .....	0	6,784	7,071	7,789	8,605	700
Estimated Outlays .....	0	3,241	6,286	7,344	8,142	4,616
Estimated Authorizations:						
Oil and Gas R&D:						
Estimated Authorization Level .....	0	422	437	477	526	553
Estimated Outlays .....	0	21	258	444	539	512
Loan Guarantees:						
Estimated Authorization Level .....	0	200	200	200	0	0
Estimated Outlays .....	0	10	80	160	190	120
External Regulation of DOE Labs:						
Estimated Authorization Level .....	0	153	152	104	107	8
Estimated Outlays .....	0	52	122	137	118	73
Other Activities:						
Estimated Authorization Level .....	0	71	80	90	11	11
Estimated Outlays .....	0	29	65	83	57	23
Subtotal of Estimated Authorizations:						
Estimated Authorization Level .....	0	845	869	872	644	572
Estimated Outlays .....	0	113	525	824	904	727
Total Proposed Changes:						
Estimated Authorization Level .....	0	7,630	7,940	8,660	9,249	1,272
Estimated Outlays .....	0	3,353	6,811	8,168	9,046	5,344
Spending Under H.R. 238:						
Estimated Authorization Level <sup>1</sup> .....	5,251	7,630	7,940	8,660	9,249	1,272
Estimated Outlays .....	5,044	6,075	7,382	8,314	9,093	5,344

<sup>1</sup>The 2003 level is the amount appropriated for that year for DOE programs related to science, energy supply, fossil energy, and certain energy conservation programs. It also includes \$5 million that was appropriated in 2003 for grants made by EPA to upgrade school buses.

Note.—R & D=Research and Development.

Basis of estimate: For this estimate, CBO assumes that the amounts authorized by H.R. 238 will be appropriated near the beginning of each fiscal year and that spending will follow historical patterns for ongoing or similar activities.

*Authorization of specified amounts*

H.R. 238 would specifically authorize the appropriation of \$31.8 billion over the 2004–2012 period for certain research and development (R&D), grant, and loan programs. Over half of this funding (or \$17.9 billion) would be allocated to DOE’s science programs, with most of the balance going to R&D related to energy efficiency and various fuel sources. Other provisions specifically authorize \$500 million for grants to states and localities for acquiring vehicles and school buses that use alternative fuels and ultra-low-sulfur diesel fuel; \$125 million for a direct loan for a specific coal project in Alaska; \$23 million for cooperative research between the United States and Mexico; and \$1 million for feasibility studies on using post-consumer carpet in cement kilns and on establishing a center for testing next-generation fuel cells. Estimated outlays for the specified authorizations would total \$29.6 billion over the next five years and \$31.8 billion over the next 10 years.

*Estimated authorizations*

In addition to these specified amounts, H.R. 238 would authorize appropriations for other research programs, credit assistance, grants, studies, and regulatory reforms. CBO estimates that implementing these provisions would cost a total of \$3.1 billion over the 2004–2008 period and a total of \$4.9 billion over the 10-year period.

**Oil and Gas Research.** H.R. 238 would allow DOE to spend 7.5 percent of the government’s collections from oil and gas royalties for certain oil and gas research, subject to future appropriation action. This authorization for oil and gas research and development programs would extend through fiscal year 2010. Based on CBO’s projection of royalties from oil and gas production, we estimate that this provision would cost between \$400 million to \$500 million annually.

**Loan Guarantees.** The bill also would authorize DOE to guarantee loans for certain gasification projects that use coal or other natural resources as input. Section 174 would allow DOE to provide a loan guarantee for a 400 megawatt project that uses integrated gasification combined-cycle technology and sells power in deregulated energy markets at competitive rates without subsidies from ratepayers.

The bill also would authorize the department to guarantee loans for at least one polygeneration plant that uses petroleum coke gasification technology. (Polygeneration plants typically produce multiple products, such as electricity, chemicals, and steam.)

Under credit reform procedures, funds must be appropriated in advance to cover the subsidy cost of such loan guarantees, measured on a present-value basis. CBO expects that gasification and polygeneration projects would be riskier than conventional power plants. Both the coal and coke projects would require large capital investments, ranging from over \$500 million for a 400 megawatt gasification plant to \$1 billion or more for some of the polygeneration plants being proposed in the United States. In contracts, a conventional natural gas power plant could be built for half the cost. As a result, the gasification and coke projects are financially viable only when operating costs are well below those using alternative fuels. In addition, the new technologies may pose

special technical risks. The credit risk posed by such projects also would depend on the terms of purchase agreements and other contracts.

H.R. 238 does not impose any limits on the amount or terms of those loan guarantees. For this estimate, CBO assumes that DOE would guarantee investments totaling about \$2 billion over the next five years. The subsidy cost of such loan guarantees could vary widely—at worst, the government could absorb all of the risk, effectively converting the loan guarantees into a grant (as occurred in the 1980s for a coal gasification project in North Dakota). For this estimate, CBO assumes that DOE would only guarantee projects if the terms are at least equivalent to those of bonds rated CCC by companies like Standard and Poor and Moodys. Projects with this rating typically have a cumulative default risk of more than 50 percent. At the same time, CBO assumes that coal or coke projects are unlikely to be more creditworthy than conventional power plants (many of which have a BB rating, which suggests a cumulative default risk of about 24 percent). Given this range of possible outcomes, CBO estimates that these provisions would result in loans being guaranteed with a 30 percent subsidy, resulting in a cost of about \$600 million over the 2004–2008 period.

**External Regulation.** Title II would authorize the Nuclear Regulatory Commission and the Occupational Safety and Health Administration (OSHA) to regulate 10 of DOE's national energy laboratories. Under current law, DOE is responsible for regulating those labs. Based on information from DOE, OSHA, and NRC, CBO estimates that transferring the regulation of those labs to NRC and OSHA would have a gross cost of about \$525 million over the 2004–2008 period, assuming appropriation of the necessary amounts. The NRC, however, has the authority to offset a substantial portion of its appropriation with fees charged to facilities it regulates. After accounting for such collections, we estimate that the net cost of implementing H.R. 238 would be about \$500 million over the same period.

The cost of transferring the regulatory authority to NRC and OSHA would include modifying DOE facilities to meet current NRC and OSHA standards, updating OSHA and NRC rules and regulations to accommodate unique DOE facilities, and decommissioning facilities no longer in use. Based on information from these agencies, CBO estimates that the cost of administrative changes and upgrading DOE facilities would be about \$500 million over the 2004–2008 period. This figure could be lower or higher depending upon how stringently NRC and OSHA regulate the labs. In addition, it is likely that a portion of the cost to upgrade and decommission facilities could be incurred under current law. Finally, CBO estimates that NRC and OSHA would spend about \$7 million annually to inspect and regulate the labs.

External regulation could result in some cost savings to DOE when NRC and OSHA undertake some of DOE's current responsibilities. Under current law, DOE spends about \$145 million a year to regulate these labs. Based on information from DOE and the General Accounting Office, we expect any such savings would eventually be \$5 million to \$10 million a year, but would not be realized for several years.

Other Activities. H.R. 238 would authorize appropriation of the amounts necessary for several other initiatives. It would authorize EPA to issue grants over the 2004–2006 period to demonstrate technologies for retrofitting diesel school buses so they can use cleaner fuels. Based on information from EPA, CBO estimates that the agency would spend a total of \$210 million over the 2004–2008 period for such projects. Another provision would authorize DOE to support the development of biopower and biofuels projects that use certain rice, barley, sugarcane, and forest products. CBO estimates that such activities would cost around \$10 million annually, based on information from DOE. Finally, the bill would authorize a study by the National Academy of Sciences (NAS) on issues related to the commercialization and transfer of technologies developed by DOE. According to the NAS, this study would cost about \$600,000.

Intergovernmental and private-sector impact: Under current law, the NRC collects annual fees from its licensees, both public and private, to offset a major portion of its general fund appropriation. Because H.R. 238 would shift the regulatory responsibility for certain nonmilitary energy laboratories from the Department of Energy to NRC, CBO expects that additional fees would be collected from the licensees to cover the cost of the external regulation. The duty to pay those fee increases would be considered both an intergovernmental and a private-sector mandate under UMRA as it results in an increase in the cost of an existing mandate. Assuming amounts necessary to cover the costs of NRC's additional regulatory responsibilities are appropriated, CBO estimates the additional fees would total \$24 million over the next five years. Those additional costs to NRC licensees would fall well below the annual thresholds established by UMRA (\$59 million for intergovernmental mandates and \$117 million for private-sector mandates in 2003, adjusted annually for inflation).

The remaining provisions of H.R. 238 contain no intergovernmental or private-sector mandates as defined in UMRA. States would benefit from the research and development initiatives that seek greater energy efficiency in all major energy sectors. States that participate in the proposed grant programs for secondary battery use, advanced technology transfer centers, renewable energy in government buildings, clean school and transit buses, and other initiatives may face match requirements and other costs, but any such costs result from conditions of federal aid, and thus, would be voluntary.

Estimate prepared by: Federal Costs: Julie Middleton, Kathleen Gramp, Lisa Cash Driskill, and Susanne Mehlman. Impact on State, Local, and Tribal Governments: Greg Waring. Impact on the Private Sector: Paige Piper/Bach.

Estimate approved by: Peter H. Fontaine, Deputy Assistant Director for Budget Analysis.

#### XI. COMPLIANCE WITH PUBLIC LAW 104-4

H.R. 238 contains no unfunded mandates.

#### XII. COMMITTEE OVERSIGHT FINDINGS AND RECOMMENDATIONS

Rule XIII, clause 3(c)(1) of the Rules of the House of Representatives requires each Committee Report on a measure approved by

the Committee to include oversight findings and recommendations required pursuant to clause 2(b)(1) of rule X. The Committee on Science's oversight findings and recommendations are reflected in the body of this report.

### XIII. CONSTITUTIONAL AUTHORITY STATEMENT

Rule XIII, clause 3(d)(1) of the Rules of the House of Representatives requires that each report of a Committee on a public bill or public joint resolution shall contain a statement citing the specific powers granted to Congress in the Constitution to enact the law proposed by the bill or joint resolution. Article I, section 8 of the Constitution of the United States grants Congress the authority to enact H.R. 238.

### XIV. FEDERAL ADVISORY COMMITTEE STATEMENT

H.R. 238 creates six advisory committee(s) within the meaning of section 5(b) of the Federal Advisory Committee Act whose functions are not currently being performed, nor could they be performed by one or more agencies, by an advisory committee already in existence, or by enlarging the mandate of an existing advisory committee:

1. Section 106(e) requires the Director of OSTP to establish an advisory committee to the interagency group responsible for the development and implementation of a National Building Performance Initiative to address energy conservation, RD&D and commercial application, and related issues.

2. Section 110A(f) requires the Secretary to establish an Advisory Committee for Advanced Energy Technology Transfer Centers composed of members from State or local energy offices, energy professionals, trade or professional associations, architects, engineers, construction professionals, manufacturers, the research community, and nonprofit energy or environmental organizations to advise the Secretary on the establishment of the Centers under this section.

3. Section 148(a) requires the Secretary to establish the Ultra-Deepwater Advisory Committee. The purpose of this advisory committee is to advise the Secretary on the development and implementation of programs related to ultra-deepwater natural gas and other petroleum resources.

4. Section 148(b) requires the Secretary to establish the Unconventional Resources Technology Advisory Committee. The purpose of this advisory committee is to advise the Secretary on the development and implementation of programs under this part related to unconventional natural gas and other petroleum resources.

5. Section 187(b)(2) requires the Secretary to establish the Science Advisory Committee within the Office of Science to include the chairs of the existing scientific program advisory committees.

6. Section 188 requires the Secretary to establish the Technology Transfer Working Group, which shall consist of representatives of the National Laboratories and single-purpose research facilities.

In addition, H.R. 238, section 182 amends section 108 of the Spark M. Matsunaga Hydrogen Research, Development, and Demonstration Act of 1990 by replacing the existing Hydrogen Technical Advisory Panel with the Hydrogen Technical and Fuel Cell Advisory Committee consisting of experts drawn from domestic in-

dustry, academia, professional societies, governmental laboratories, and financial, environmental, and other organizations, as appropriate, to review and advise on the progress made through the programs and activities authorized under the Act.

Section 187(a) authorizes the creation of at least four advisory committees within the meaning of section 5(b) of the Federal Advisory Committee Act whose functions are not currently being performed, but whose functions could potentially be assumed by expanding the mandate of existing committees. In these cases, however, the decision to establish new committees or expand existing ones is left to the discretion of the Secretary.

XV. CONGRESSIONAL ACCOUNTABILITY ACT

The Committee finds that H.R. 238 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).

XVI. STATEMENT ON PREEMPTION OF STATE, LOCAL, OR TRIBAL LAW

H.R. 238 is not intended to preempt any State, local, or Tribal law.

XVII. 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 italic, existing law in which no change is proposed is shown in roman):

**HIGH-PERFORMANCE COMPUTING ACT OF 1991**

\* \* \* \* \*

**SEC. 4. DEFINITIONS.**

As used in this Act, the term—

(1) \* \* \*

\* \* \* \* \*

(3) “high-performance computing” **means** and “*networking and information technology*” *mean* advanced computing, communications, and information technologies, including scientific workstations, supercomputer systems **[(including vector supercomputers and large scale parallel systems)]**, high-capacity and high-speed networks, special purpose and experimental systems, and applications and systems software;

(4) “Internet” means the international computer network of both Federal and non-Federal interoperable **[packet switched]** data networks;

\* \* \* \* \*

**TITLE II—AGENCY ACTIVITIES**

\* \* \* \* \*

**SEC. 203. DEPARTMENT OF ENERGY ACTIVITIES.**

(a) GENERAL RESPONSIBILITIES.—As part of the [Program described in title I, the Secretary of Energy shall—

[(1) perform research and development on, and systems evaluations of, high-performance computing and communications systems;

[(2) conduct computational research with emphasis on energy applications;

[(3) support basic research, education, and human resources in computational science; and

[(4) provide for networking infrastructure support for energy-related mission activities.] *Networking and Information Technology Research and Development Program, the Secretary of Energy shall conduct basic and applied research in networking and information technology, with emphasis on—*

*(1) supporting fundamental research in the physical sciences and engineering, and energy applications;*

*(2) providing supercomputer access and advanced communication capabilities and facilities to scientific researchers; and*

*(3) developing tools for distributed scientific collaboration.*

(b) COLLABORATIVE CONSORTIA.—In accordance with the [Program] *Networking and Information Technology Research and Development Program*, the Secretary of Energy shall establish High-Performance Computing Research and Development Collaborative Consortia by soliciting and selecting proposals. Each Collaborative Consortium shall—

(1) \* \* \*

\* \* \* \* \*

[(e) AUTHORIZATION OF APPROPRIATIONS.—(1) There are authorized to be appropriated to the Secretary of Energy for the purposes of the Program \$93,000,000 for fiscal year 1992; \$110,000,000 for fiscal year 1993; \$138,000,000 for fiscal year 1994; \$157,000,000 for fiscal year 1995; and \$169,000,000 for fiscal year 1996.

[(2) There are authorized to be appropriated to the Secretary of Energy for fiscal years 1992, 1993, 1994, 1995, and 1996, such funds as may be necessary to carry out the activities that are not part of the Program but are authorized by this section.]

*(e) AUTHORIZATION OF APPROPRIATIONS.—There are authorized to be appropriated to the Secretary of Energy to carry out the Networking and Information Technology Research and Development Program such sums as may be necessary for fiscal years 2004 through 2007.*

\* \* \* \* \*

**SPARK M. MATSUNAGA HYDROGEN RESEARCH, DEVELOPMENT, AND DEMONSTRATION ACT OF 1990**

\* \* \* \* \*

**[SEC. 102. FINDING, PURPOSES, AND DEFINITION.**

[(a) FINDING.—Congress finds that it is in the national interest to accelerate efforts to develop a domestic capability to economically produce hydrogen in quantities that will make a significant

contribution toward reducing the Nation's dependence on conventional fuels.

[(b) PURPOSES.—The purposes of this Act are—

[(1) to direct the Secretary of Energy to conduct a research, development, and demonstration program leading to the production, storage, transport, and use of hydrogen for industrial, residential, transportation, and utility applications;

[(2) to direct the Secretary to develop a technology assessment and information transfer program among the Federal agencies and aerospace, transportation, energy, and other entities; and

[(3) to develop renewable energy resources as a primary source of energy for the production of hydrogen.

[(c) DEFINITION.—As used in this Act, the term:

[(1) “critical technology” (or “critical technical issue”) means a technology (or issue) that, in the opinion of the Secretary, requires understanding and development in order to take the next needed step in the development of hydrogen as an economic fuel or storage medium;

[(2) “Department” means the Department of Energy; and

[(3) “Secretary” means the Secretary of Energy.

### **[(§ 103. Report to Congress**

[(a) Not later than January 1, 1999, the Secretary shall transmit to Congress a detailed report on the status and progress of the programs authorized under this Act.

[(b) A report under subsection (a) shall include, in addition to any views and recommendations of the Secretary—

[(1) an analysis of the effectiveness of the programs authorized under this chapter, to be prepared and submitted to the Secretary by the Hydrogen Technical Advisory Panel established under section 108 of this Act; and

[(2) recommendations of the Hydrogen Technical Advisory Panel for any improvements in the program that are needed, including recommendations for additional legislation.

### **[(§ 104. Hydrogen research and development**

[(a) The Secretary shall conduct a hydrogen research and development program relating to production, storage, transportation, and use of hydrogen, with the goal of enabling the private sector to demonstrate the technical feasibility of using hydrogen for industrial, residential, transportation, and utility applications.

[(b) In conducting the program authorized by this section, the Secretary shall—

[(1) give particular attention to developing an understanding and resolution of critical technical issues preventing the introduction of hydrogen into the marketplace;

[(2) initiate or accelerate existing research in critical technical issues that will contribute to the development of more economic hydrogen production and use, including, but not limited to, critical technical issues with respect to production (giving priority to those production techniques that use renewable energy resources as their primary source of energy for hydrogen production), liquefaction, transmission, distribution,

storage, and use (including use of hydrogen in surface transportation); and

[(3) survey private sector hydrogen activities and take steps to ensure that research and development activities under this section do not displace or compete with the privately funded hydrogen research and development activities of United States industry.

[(c) The Secretary is authorized to evaluate any reasonable new or improved technology, including basic research on highly innovative energy technologies, that could lead or contribute to the development of economic hydrogen production, storage, and utilization.

[(d) The Secretary is authorized to evaluate any reasonable new or improved technology that could lead or contribute to, or demonstrate the use of, advanced renewable energy systems or hybrid systems for use in isolated communities that currently import diesel fuel as the primary fuel for electric power production.

[(e) The Secretary is authorized to arrange for tests and demonstrations and to disseminate to researchers and developers information, data, and other materials necessary to support the research and development activities authorized under this section and other efforts authorized under this chapter, consistent with section 106 of this Act.

[(f) The Secretary shall carry out the research and development activities authorized under this section only through the funding of research and development proposals submitted by interested persons according to such procedures as the Secretary may require and evaluate on a competitive basis using peer review. Such funding shall be in the form of a grant agreement, procurement contract, or cooperative agreement (as those terms are used in chapter 63 of title 31, United States Code).

[(g) The Secretary shall not consider a proposal submitted by a person from industry unless the proposal contains a certification that reasonable efforts to obtain non-Federal funding for the entire cost of the project have been made, and that such non-Federal funding could not be reasonably obtained. As appropriate, the Secretary shall require a commitment from non-Federal sources of at least 50 percent of the cost of the development portion of such a proposal.

[(h) The Secretary shall not carry out any activities under this section that unnecessarily duplicate activities carried out elsewhere by the Federal Government or industry.

[(i) The Secretary shall establish, after consultation with other Federal agencies, terms and conditions under which Federal funding will be provided under this chapter that are consistent with the Agreement on Subsidies and Countervailing Measures referred to in section 101(d)(12) of the Uruguay Round Agreement Act (19 U.S.C. 3511(d)(12)).

#### **ISEC. 105. DEMONSTRATIONS.**

[(a) REQUIREMENT.—The Secretary shall conduct demonstrations of critical technologies, preferably in self-contained locations, so that technical and non-technical parameters can be evaluated to best determine commercial applicability of the technology.

[(b) SMALL-SCALE DEMONSTRATIONS.—Concurrently with activities conducted pursuant to section 104, the Secretary shall conduct

small-scale demonstrations of hydrogen technology at self-contained sites.

[(c) The Secretary shall require a commitment from non-Federal sources of at least 50 percent of the cost of any demonstration conducted under this section.

**[SEC. 106. TECHNOLOGY TRANSFER PROGRAM.**

[(a) PROGRAM.—The Secretary shall conduct a program designed to accelerate wider application of hydrogen production, storage, utilization, and other technologies available in near term as a result of aerospace experience as well as other research progress by transferring critical technologies to the private sector. The Secretary shall direct the program with the advice and assistance of the Hydrogen Technical Advisory Panel established under section 108. The objective in seeking this advice is to increase participation of private industry in the demonstration of near commercial applications through cooperative research and development arrangements, joint ventures or other appropriate arrangements involving the private sector.

[(b) INFORMATION.—The Secretary, in carrying out the program authorized by subsection (a), shall—

[(1) undertake an inventory and assessment of hydrogen technologies and their commercial capability to economically produce, store, or utilize hydrogen in aerospace, transportation, electric utilities, petrochemical, chemical, merchant hydrogen, and other industrial sectors; and

[(2) develop a National Aeronautics Space Administration, Department of Energy, and industry information exchange program to improve technology transfer for—

[(A) application of aerospace experience by industry;

[(B) application of research progress by industry and aerospace;

[(C) application of commercial capability of industry by aerospace; and

[(D) expression of industrial needs to research organizations.

The information exchange program may consist of workshops, publications, conferences, and a data base for the use by the public and private sectors.

The Secretary shall also foster the exchange of generic, nonproprietary information and technology, developed pursuant to this chapter, among industry, academia, and the Federal Government, to help the United States economy attain the economic benefits of this information and technology.

**[SEC. 107. COORDINATION AND CONSULTATION.**

[(a) SECRETARY'S RESPONSIBILITY.—The Secretary shall have overall management responsibility for carrying out programs under this Act. In carrying out such programs, the Secretary, consistent with such overall management responsibility—

[(1) shall use the expertise of the National Aeronautics and Space Administration and the Department of Transportation; and

[(2) may use the expertise of any other Federal agency in accordance with subsection (b) in carrying out any activities under this title, to the extent that the Secretary determines

that any such agency has capabilities which would allow such agency to contribute to the purpose of this Act.

[(b) ASSISTANCE.—The Secretary may, in accordance with subsection (a), obtain the assistance of any department, agency, or instrumentality of the Executive branch of the Federal Government upon written request, on a reimbursable basis or otherwise and with the consent of such department, agency, or instrumentality. Each such request shall identify the assistance the Secretary deems necessary to carry out any duty under this Act.

[(c) CONSULTATION.—The Secretary shall consult with the Administrator of the National Aeronautics and Space Administration, the Administrator of the Environmental Protection Agency, the Secretary of Transportation, and the Hydrogen Technical Advisory Panel established under section 108 in carrying out his authorities pursuant to this Act.

**[SEC. 108. TECHNICAL PANEL.**

[(a) ESTABLISHMENT.—There is hereby established the Hydrogen Technical Advisory Panel (the “technical panel”), to advise the Secretary on the programs under this Act.

[(b) MEMBERSHIP.—The technical panel shall be appointed by the Secretary and shall be comprised of such representatives from domestic industry, universities, professional societies, Government laboratories, financial, environmental, and other organizations as the Secretary deems appropriate based on his assessment of the technical and other qualifications of such representatives. Appointments to the technical panel shall be made within 90 days after the enactment of this Act. The technical panel shall have a chairman, who shall be elected by the members from among their number.

[(c) COOPERATION.—The heads of the departments, agencies, and instrumentalities of the Executive branch of the Federal Government shall cooperate with the technical panel in carrying out the requirements of this section and shall furnish to the technical panel such information as the technical panel deems necessary to carry out this section.

[(d) REVIEW.—The technical panel shall review and make any necessary recommendations to the Secretary on the following items—

[(1) the implementation and conduct of programs under this Act; and

[(2) the economic, technological, and environmental consequences of the deployment of hydrogen production and use systems.

[(e) SUPPORT.—The Secretary shall provide such staff, funds and other support as may be necessary to enable the technical panel to carry out the functions described in this section.

**[SEC. 109. AUTHORIZATION OF APPROPRIATIONS.**

[There is hereby authorized to be appropriated to carry out the purposes of this Act (in addition to any amounts made available for such purposes under other Acts)—

[(1) \$3,000,000 for the fiscal year 1992;

[(2) \$7,000,000 for the fiscal year 1993;

[(3) \$10,000,000 for the fiscal year 1994;

[(4) \$14,500,000 for fiscal year 1996;

[(5) \$20,000,000 for fiscal year 1997;

- [(6) \$25,000,000 for fiscal year 1998;
- [(7) \$30,000,000 for fiscal year 1999;
- [(8) \$35,000,000 for fiscal year 2000; and
- [(9) \$40,000,000 for fiscal year 2001.]

**SEC. 102. FINDINGS AND DEFINITIONS.**

(a) *FINDINGS.*—Congress finds that—

(1) *the United States is currently dependent on foreign sources for a majority of its petroleum supply;*

(2) *the Nation's dependence on foreign petroleum is expected to increase in the decades ahead;*

(3) *it is in the national interest to reduce dependence on imported petroleum by accelerating Federal efforts to partner with the private sector in developing hydrogen and fuel cell technologies;*

(4) *it is in the national interest to support industry's efforts to develop a light duty vehicle fleet that is free or near free of pollutant emissions and greenhouse gas emissions, and that helps to reduce the Nation's dependence on petroleum in a manner that maintains the freedom of consumers to purchase the kinds of vehicles they wish to drive and the freedom to refuel those vehicles safely and affordably;*

(5) *the development of hydrogen fuel cell vehicles and supporting infrastructure will benefit from and accelerate the parallel advancement of fuel cells for stationary power that will enhance the resiliency, reliability, and environmental performance of the Nation's electricity infrastructure;*

(6) *fuel cell technology for consumer electronics and portable power will benefit from, and advance the development of, hydrogen fuel cell vehicles and supporting infrastructure;*

(7) *there is a need for deployment of bridging technologies that can contribute to reducing petroleum demand and decreasing air emissions, including—*

(A) *gasoline-electric and diesel-electric hybrid drive systems;*

(B) *advanced combustion engines (including clean diesel), electric battery, and power electronics; and*

(C) *alternative fuels and other technologies;*

(8) *low-cost hydrogen production, storage, and delivery facilities are essential to the success of the FreedomCAR program; and*

(9) *vehicle technology development work should be performed in a manner that is cognizant of consumer acceptance and marketplace success.*

(b) *DEFINITIONS.*—In this Act:

(1) *The term "Advisory Committee" means the Hydrogen Technical and Fuel Cell Advisory Committee established under section 108 of this Act.*

(2) *The term "Department" means the Department of Energy.*

(3) *The term "fuel cell" means a device that directly converts the chemical energy of a fuel and an oxidant into electricity by an electrochemical process taking place at separate electrodes in the device.*

(4) *The term "FreedomCAR" is the acronym for a Department initiative in automotive research and development entitled "Freedom Cooperative Automotive Research".*

(5) The term “infrastructure” means the equipment, systems, or facilities used to produce, distribute, deliver, or store hydrogen and other advanced clean fuels.

(6) The term “light duty vehicle” means a car or truck classified by the Department of Transportation as a Class I or IIA vehicle.

(7) The term “Secretary” means the Secretary of Energy.

**SEC. 103. PROGRAM.**

(a) *IN GENERAL.*—The Secretary shall conduct a research, development, demonstration, and commercial application program designed to accelerate the use of hydrogen and related technologies in stationary and transportation applications. The goals of the program shall include—

(1) to enable a decision by automakers not later than 2015 to offer affordable and technically viable hydrogen fuel cell vehicles in the mass consumer market;

(2) to enable production and delivery to consumers of model year 2020 hydrogen fuel cell vehicles that will have—

(A) a range of at least three hundred miles;

(B) safety and performance comparable to vehicle technologies in the market; and

(C) when compared to light duty vehicles in model year 2003—

(i) a fuel economy that is two and one half times the equivalent fuel economy of comparable light duty vehicles in model year 2003; and

(ii) zero or near zero emissions of pollutants; and

(D) vehicle fuel system crash integrity and occupant protection; and

(3) to enable by 2020 the safe and convenient commercial production and delivery of hydrogen that will have—

(A) the capacity to meet the demand for stationary and mobile hydrogen fuel cells;

(B) safety and performance characteristics comparable to other fuels; and

(C) improved overall efficiency and zero or near zero emissions when compared to fuels used in 2003.

(b) *ACTIVITIES.*—The program authorized under this section shall address—

(1) production of hydrogen from diverse energy sources, including—

(A) fossil fuels, in conjunction with carbon capture and sequestration;

(B) hydrogen-carrier fuels (including ethanol and methanol);

(C) renewable energy resources; and

(D) nuclear energy;

(2) delivery of hydrogen or hydrogen-carrier fuels, including—

(A) transmission by pipeline and other distribution methods; and

(B) safe, convenient, and economic refueling of vehicles either at central refueling stations or through distributed on-site generation;

(3) storage of hydrogen or hydrogen-carrier fuels, including development of materials for safe and economic storage in gas-

*eous, liquid, or solid form at refueling facilities and onboard vehicles;*

*(4) development of safe, durable, affordable, and efficient fuel cells, including research and development on fuel-flexible fuel cell power systems, improved manufacturing processes, high-temperature membranes, cost-effective fuel processing for natural gas, fuel cell stack and system reliability, low temperature operation, and cold start capability; and*

*(5) development, in conjunction with the National Institute of Standards and Technology, of necessary codes and standards (including international codes and standards) and safety practices for the production, distribution, storage, and use of hydrogen, hydrogen-carrier fuels and related products.*

*(c) DEMONSTRATION.—In carrying out the demonstration program under this section, the Secretary shall fund a limited number of projects and shall, to the extent practicable—*

*(1) select only projects that—*

*(A) involve using hydrogen and related products at facilities or installations that would exist without the demonstration program, such as existing office buildings, military bases, vehicle fleet centers, transit bus authorities, or parks; and*

*(B) depend on reliable power from hydrogen to carry out essential activities; and*

*(2) favor projects that—*

*(A) lead to the replication of hydrogen technologies and draw such technologies into the marketplace;*

*(B) integrate in a single project both mobile and stationary applications of hydrogen fuel cells;*

*(C) address the interdependency of demand for hydrogen fuel cell applications and hydrogen fuel infrastructure; or*

*(D) raise awareness of hydrogen technology among the public.*

*(d) MERIT REVIEW.—The Secretary shall carry out the program under this section using a competitive, merit-review process and consistent with the generally applicable Federal laws and regulations governing awards of financial assistance, contracts, or other agreements.*

*(e) COST SHARING.—(1) For projects carried out through grants, cooperative agreements, or contracts under this section, the Secretary shall require a commitment from non-Federal sources of at least—*

*(A) 20 percent of the cost of a research and development project; and*

*(B) 50 percent of the cost of a demonstration project.*

*(2) The Secretary may reduce the cost-sharing requirement under paragraph (1)—*

*(A) if the Secretary determines that the project involves research of a basic or fundamental nature;*

*(B) if the Secretary determines that a demonstration or commercial application project involves unusual technological risks; or*

*(C) for technical analyses or other activities that the Secretary does not expect to result in a marketable product.*

(3) *The Secretary may consider the size of the non-Federal share in selecting projects.*

**SEC. 104. FREEDOM CAR.**

(a) *IN GENERAL.—In coordination with the program under section 103, the Secretary shall carry out a research, development, demonstration, and commercial application program on advanced vehicle technologies, to be known as the FreedomCAR program.*

(b) *ACTIVITIES.—The FreedomCAR program shall address—*

- (1) *engine and emission control systems;*
- (2) *energy storage, electric propulsion, and hybrid systems;*
- (3) *automotive materials;*
- (4) *clean fuels in addition to hydrogen; and*
- (5) *other advanced vehicle technologies.*

(c) *DEMONSTRATION.—Demonstrations involving hydrogen shall be conducted as part of the program under section 103.*

(d) *MERIT REVIEW AND COST SHARING.—The Secretary shall carry out the FreedomCAR program in compliance with sections 103(d) and (e).*

**SEC. 105. PLAN.**

*Not later than six months after the date of enactment of the George E. Brown, Jr. and Robert S. Walker Hydrogen Future Act of 2003, the Secretary shall transmit to the Congress a coordinated plan for the programs described in sections 103 and 104 and any other programs of the Department that are directly related to fuel cells or hydrogen. The plan shall be consistent with the National Hydrogen Energy Roadmap published by the Department in October of 2002 and shall describe, at a minimum—*

- (1) *the agenda for the programs for the next five years, including what research, development, demonstration, and commercial application will be conducted to carry out each activity enumerated in sections 103(b) and 104(b);*
- (2) *the role national laboratories, institutions of higher education, small businesses, and other private sector firms are expected to play in the programs;*
- (3) *the technical milestones that will be used to evaluate the programs for the next five years;*
- (4) *the most significant technical hurdles that stand in the way of achieving the goals described in section 103(a), and how the programs will address those hurdles; and*
- (5) *the policy assumptions that are driving the research agenda, including any assumptions that would affect the sources of hydrogen or the marketability of hydrogen-related products.*

**SEC. 106. EDUCATION, OUTREACH, AND TECHNOLOGY TRANSFER.**

(a) *IN GENERAL.—The Secretary may carry out programs and activities for interagency, intergovernmental, and international education, information exchange, and cooperation related to hydrogen and hydrogen-related products.*

(b) *TECHNOLOGY TRANSFER.—(1) The Secretary may conduct a program to transfer technology to the private sector under this Act. The purpose of the technology transfer program is to foster the exchange of generic, nonproprietary information and technology, developed under this Act, among industry, academia, and the Federal Government, to help the United States economy attain the economic benefits of this information and technology, among other purposes.*

(2) *The Secretary shall direct the program authorized by this subsection with the advice and assistance of the Advisory Committee.*

**SEC. 107. INTERAGENCY TASK FORCE.**

(a) *ESTABLISHMENT.*—Not later than 120 days after the date of enactment of the George E. Brown, Jr. and Robert S. Walker Hydrogen Future Act of 2003, the President shall establish an interagency task force, chaired by the Director of the Office of Science and Technology Policy or his designee, with representatives from each of the following:

- (1) *The Department of Energy.*
- (2) *The Department of Transportation.*
- (3) *The Department of State.*
- (4) *The Department of Defense.*
- (5) *The Department of Commerce (including the National Institute of Standards and Technology).*
- (6) *The Environmental Protection Agency.*
- (7) *The National Aeronautics and Space Administration.*
- (8) *Other Federal agencies as the Director determines appropriate.*

(b) *DUTIES.*—

(1) *IMPLEMENTATION.*—*The interagency task force shall work toward development of—*

- (A) *a safe, economical, and environmentally sound hydrogen infrastructure;*
- (B) *uniform hydrogen codes, standards, and safety protocols;*
- (C) *fuel cells in government applications, including portable, stationary, and transportation applications; and*
- (D) *vehicle hydrogen fuel system integrity safety performance.*

(2) *ACTIVITIES.*—*The interagency task force may organize workshops and conferences, may issue publications, and may create databases to carry out its duties. The interagency task force shall—*

- (A) *foster the exchange of generic, nonproprietary information and technology among industry, academia, and government;*
- (B) *develop and maintain an inventory and assessment of hydrogen, fuel cells, and other advanced technologies, including the commercial capability of each technology for the economic and environmentally safe production, distribution, delivery, storage, and use of hydrogen;*
- (C) *integrate technical and other information made available as a result of the programs and activities under this Act;*
- (D) *promote the marketplace introduction of infrastructure for hydrogen-powered fuel cell vehicles; and*
- (E) *conduct an education program to provide hydrogen and fuel cell information to potential end-users in coordination with the program under section 106.*

(c) *AGENCY COOPERATION.*—*The heads of all agencies, including those whose agencies are not represented on the interagency task force, shall cooperate with and furnish information to the interagency task force and the Department.*

**SEC. 108. ADVISORY COMMITTEE.**

(a) *ESTABLISHMENT.*—The Hydrogen Technical and Fuel Cell Advisory Committee shall be established to advise the Secretary on the programs and activities under this Act.

(b) *MEMBERSHIP.*—

(1) *MEMBERS.*—The Secretary shall appoint not fewer than 12 nor more than 25 members. The Secretary shall appoint members to represent domestic industry, academia, professional societies, government agencies, and financial, environmental, and other appropriate organizations based on the Secretary's assessment of the technical and other qualifications of committee members and the needs of the Advisory Committee.

(2) *TERMS.*—The term of a member of the Advisory Committee shall be not more than three years. The Secretary may appoint members of the Advisory Committee in a manner that allows the terms of the members serving at any time to expire at spaced intervals so as to ensure continuity in the functioning of the Advisory Committee. A member of the Advisory Committee whose term is expiring may be reappointed.

(3) *CHAIRPERSON.*—The Chair of the Advisory Committee shall be a member of the Advisory Committee, elected by the members from among their number.

(c) *REVIEW.*—(1) The Advisory Committee shall review and make recommendations to the Secretary in a biennial report on—

(A) the implementation of programs and activities under this Act; and

(B) the safety, economical, environmental, and other consequences of technologies for the production, distribution, delivery, storage, or use of hydrogen and fuel cells.

(2) The Secretary shall transmit the report under this subsection to the Congress along with a description of how the Secretary has implemented or plans to implement the recommendations, or an explanation of the reasons that a recommendation will not be implemented. The report shall be transmitted along with the President's budget proposal.

(d) *ADVISORY COMMITTEE SUPPORT.*—The Secretary shall provide resources necessary in the judgment of the Secretary for the Advisory Committee to carry out its responsibilities under this Act.

**SEC. 109. EXTERNAL REVIEW.**

(a) *PLAN.*—The Secretary shall enter into an arrangement with a competitively selected nongovernmental entity, such as the National Academy of Sciences, to review the plan prepared under section 105. The Secretary shall transmit the review to the Congress along with a plan to implement the review's recommendations or an explanation of the reasons that a recommendation will not be implemented.

(b) *BIENNIAL REVIEW.*—The Secretary shall enter into an arrangement with a competitively selected nongovernmental entity, such as the National Academy of Sciences, under which the entity will review the program under sections 103 and 104 every other year, beginning two years after the date of enactment of the George E. Brown, Jr. and Robert S. Walker Hydrogen Future Act of 2003. The entity shall review the research priorities, technical milestones, and plans for technology transfer and evaluate the progress toward achieving them. The Secretary shall transmit each review to the

*Congress along with a plan to implement the review's recommendations or an explanation for the reasons that a recommendation will not be implemented.*

**SEC. 110. MISCELLANEOUS PROVISIONS.**

(a) *DUPLICATION.*—*The Secretary shall carry out the activities of this Act in a manner that avoids unnecessary duplication or displacement of, or competition with private sector activities.*

(b) *OTHER GOVERNMENTS.*—*In carrying out this Act, the Secretary may enter into cost-sharing agreements with Federal, State, or local governments to demonstrate applications using hydrogen and fuel cells.*

(c) *REPRESENTATION.*—*The Department may represent the United States interests with respect to activities and programs under this Act, in coordination with the Department of Transportation, the National Institute of Standards and Technology, and other relevant Federal agencies, before governments and nongovernmental organizations including—*

(1) *other Federal, State, regional, and local governments and their representatives;*

(2) *industry and its representatives, including members of the energy and transportation industries; and*

(3) *in consultation with the Department of State, foreign governments and their representatives including international organizations.*

(d) *REGULATORY AUTHORITY.*—*Nothing in this Act shall be construed to alter the regulatory authority of the Department.*

**SEC. 111. AUTHORIZATION OF APPROPRIATIONS.**

*There are authorized to be appropriated to carry out this Act, in addition to any amounts made available for these purposes under other Acts—*

(1) *\$273,500,000 for fiscal year 2004;*

(2) *\$325,000,000 for fiscal year 2005;*

(3) *\$375,000,000 for fiscal year 2006;*

(4) *\$400,000,000 for fiscal year 2007; and*

(5) *\$425,000,000 for fiscal year 2008.*

## HYDROGEN FUTURE ACT OF 1996

**[SECTION 1. SHORT TITLE.**

**[**This Act may be cited as the “Hydrogen Future Act of 1996”.

**[SEC. 2. DEFINITIONS.**

**[**For purposes of titles II and III—

**[**(1) the term “Department” means the Department of Energy; and

**[**(2) the term “Secretary” means the Secretary of Energy.

### [TITLE I—HYDROGEN

**[SEC. 101. PURPOSES AND DEFINITIONS.**

**[**(a) Section 102(b)(1) of Public Law 101-566 (42 U.S.C. 12401(b)(1)) is amended to read as follows:

**[**“(1) to direct the Secretary of Energy to conduct a research, development, and demonstration program leading to the production,

storage, transport, and use of hydrogen for industrial, residential, transportation, and utility applications.”.

[(b) Section 102(c) of Public Law 101–566 (42 U.S.C. 12401(c)) is amended—

[(1) in subsection (1) by striking “; and” inserting “;”;

[(2) by redesignating subsection (2) as subsection (3); and

[(3) by inserting before subsection (3) (as redesignated) the following new subsection:

[(“(2) ‘Department’ means the Department of Energy; and”].

**[SEC. 102. REPORTS TO CONGRESS.**

[(a) Section 103 of Public Law 101–566 (42 U.S.C. 12402) is amended to read as follows:

**[“§ 103. Report to Congress**

[(a) Not later than January 1, 1999, the Secretary shall transmit to Congress a detailed report on the status and progress of the programs authorized under this Act.

[(b) A report under subsection (a) shall include, in addition to any views and recommendations of the Secretary—

[(“(1) an analysis of the effectiveness of the programs authorized under this chapter, to be prepared and submitted to the Secretary by the Hydrogen Technical Advisory Panel established under section 108 of this Act; and

[(“(2) recommendations of the Hydrogen Technical Advisory Panel for any improvements in the program that are needed, including recommendations for additional legislation.”].

[(b) Section 108(d) of Public Law 101–566 (42 U.S.C. 12407(d)) is amended—

[(1) by adding “and” at the end of paragraph (1);

[(2) by striking “; and” at the end of paragraph (2) and inserting a period; and

[(3) by striking paragraph (3).

**[SEC. 103. HYDROGEN RESEARCH AND DEVELOPMENT.**

[(a) Section 104 of Public Law 101–566 (42 U.S.C. 12403) is amended to read as follows:

**[“§ 104. Hydrogen research and development**

[(a) The Secretary shall conduct a hydrogen research and development program relating to production, storage, transportation, and use of hydrogen, with the goal of enabling the private sector to demonstrate the technical feasibility of using hydrogen for industrial, residential, transportation, and utility applications.

[(b) In conducting the program authorized by this section, the Secretary shall—

[(“(1) give particular attention to developing an understanding and resolution of critical technical issues preventing the introduction of hydrogen into the marketplace;

[(“(2) initiate or accelerate existing research in critical technical issues that will contribute to the development of more economic hydrogen production and use, including, but not limited to, critical technical issues with respect to production (giving priority to those production techniques that use renewable energy resources as their primary source of energy for hydrogen production), liquefaction, transmission, distribution,

storage, and use (including use of hydrogen in surface transportation); and

[(3) survey private sector hydrogen activities and take steps to ensure that research and development activities under this section do not displace or compete with the privately funded hydrogen research and development activities of United States industry.

[(c) The Secretary is authorized to evaluate any reasonable new or improved technology, including basic research on highly innovative energy technologies, that could lead or contribute to the development of economic hydrogen production, storage, and utilization.

[(d) The Secretary is authorized to evaluate any reasonable new or improved technology that could lead or contribute to, or demonstrate the use of, advanced renewable energy systems or hybrid systems for use in isolated communities that currently import diesel fuel as the primary fuel for electric power production.

[(e) The Secretary is authorized to arrange for tests and demonstrations and to disseminate to researchers and developers information, data, and other materials necessary to support the research and development activities authorized under this section and other efforts authorized under this chapter, consistent with section 106 of this Act.

[(f) The Secretary shall carry out the research and development activities authorized under this section only through the funding of research and development proposals submitted by interested persons according to such procedures as the Secretary may require and evaluate on a competitive basis using peer review. Such funding shall be in the form of a grant agreement, procurement contract, or cooperative agreement (as those terms are used in chapter 63 of title 31, United States Code).

[(g) The Secretary shall not consider a proposal submitted by a person from industry unless the proposal contains a certification that reasonable efforts to obtain non-Federal funding for the entire cost of the project have been made, and that such non-Federal funding could not be reasonably obtained. As appropriate, the Secretary shall require a commitment from non-Federal sources of at least 50 percent of the cost of the development portion of such a proposal.

[(h) The Secretary shall not carry out any activities under this section that unnecessarily duplicate activities carried out elsewhere by the Federal Government or industry.

[(i) The Secretary shall establish, after consultation with other Federal agencies, terms and conditions under which Federal funding will be provided under this chapter that are consistent with the Agreement on Subsidies and Countervailing Measures referred to in section 101(d)(12) of the Uruguay Round Agreement Act (19 U.S.C. 3511(d)(12)).”

[(b)(1) Section 2026(a) of the Energy Policy Act of 1992 (42 U.S.C. 13436(a)) is amended by striking “, in accordance with sections 3001 and 3002 of this Act,”.

[(2) Effective October 1, 1998, section 2026 of the Energy Policy Act of 1992 (42 U.S.C. 13436) is repealed.

**[SEC. 104. DEMONSTRATIONS.**

[Section 105 of Public Law 101-566 (42 U.S.C. 12404) is amended by adding at the end the following new subsection:

[(c) The Secretary shall require a commitment from non-Federal sources of at least 50 percent of the cost of any demonstration conducted under this section.”.

**[SEC. 105. TECHNOLOGY TRANSFER.**

[Section 106(b) of Public Law 101–566 (42 U.S.C. 12405(b)) is amended by adding to the end of the subsection the following:

[(“The Secretary shall also foster the exchange of generic, non-proprietary information and technology, developed pursuant to this chapter, among industry, academia, and the Federal Government, to help the United States economy attain the economic benefits of this information and technology.”.

**[SEC. 106. AUTHORIZATION OF APPROPRIATIONS.**

[Section 109 of Public Law 101–566 (42 U.S.C. 12408) is amended—

[(1) by striking “to other Acts” and inserting “under other Acts”;

[(2) by striking “and” from the end of paragraph (2);

[(3) by striking the period from the end of paragraph (3) and inserting “;”;

[(4) by adding at the end of the section the following:

[(“(4) \$14,500,000 for fiscal year 1996;

[(“(5) \$20,000,000 for fiscal year 1997;

[(“(6) \$25,000,000 for fiscal year 1998;

[(“(7) \$30,000,000 for fiscal year 1999;

[(“(8) \$35,000,000 for fiscal year 2000; and

[(“(9) \$40,000,000 for fiscal year 2001.”.

**[TITLE II—FUEL CELLS**

**[SEC. 201. INTEGRATION OF FUEL CELLS WITH HYDROGEN PRODUCTION SYSTEMS.**

[(a) Not later than 180 days after the date of enactment of this section, and subject to the availability of appropriations made specifically for this section, the Secretary of Energy shall solicit proposals for projects to prove the feasibility of integrating fuel cells with—

[(1) photovoltaic systems for hydrogen production; or

[(2) systems for hydrogen production from solid waste via gasification or steam reforming.

[(b) Each proposal submitted in response to the solicitation under this section shall be evaluated on a competitive basis using peer review. The Secretary is not required to make an award under this section in the absence of a meritorious proposal.

[(c) The Secretary shall give preference, in making an award under this section, to proposals that—

[(1) are submitted jointly from consortia including academic institutions, industry, State or local governments, and Federal laboratories; and

[(2) reflect proven experience and capability with technologies relevant to the systems described in subsections (a)(1) and (a)(2).

[(d) In the case of a proposal involving development or demonstration, the Secretary shall require a commitment from non-Federal sources of at least 50 percent of the cost of the development or demonstration portion of the proposal.

[(e) The Secretary shall establish, after consultation with other Federal agencies, terms and conditions under which Federal funding will be provided under this title that are consistent with the Agreement on Subsidies and Countervailing Measures referred to in section 101(d)(12) of the Uruguay Round Agreement Act (19 U.S.C. 3511(d)(12)).

**[SEC. 202. AUTHORIZATION OF APPROPRIATIONS.**

[There are authorized to be appropriated, for activities under this section, a total of \$50,000,000 for fiscal years 1997 and 1998, to remain available until September 30, 1999.

**[TITLE III—DOE SCIENTIFIC AND TECHNICAL PROGRAM QUALITY**

**[SEC. 301. TEMPORARY APPOINTMENTS FOR SCIENTIFIC AND TECHNICAL EXPERTS IN DEPARTMENT OF ENERGY RESEARCH AND DEVELOPMENT PROGRAMS.**

[(a) The Secretary, utilizing authority under other applicable law and the authority of this section, may appoint for a limited term, or on a temporary basis, scientists, engineers, and other technical and professional personnel on leave of absence from academic, industrial, or research institutions to work for the Department.

[(b) The Department may pay, to the extent authorized for certain other Federal employees by section 5723 of title 5, United States Code, travel expenses for any individual appointed for a limited term or on a temporary basis and transportation expenses of his or her immediate family and his or her household goods and personal effects from that individual's residence at the time of selection or assignment to his or her duty station. The Department may pay such travel expenses to the same extent for such an individual's return to the former place of residence from his or her duty station, upon separation from the Federal service following an agreed period of service. The Department may also pay a per diem allowance at a rate not to exceed the daily amounts prescribed under section 5702 of title 5 to such an individual, in lieu of transportation expenses of the immediate family and household goods and personal effects, for the period of his or her employment with the Department. Notwithstanding any other provision of law, the employer's contribution to any retirement, life insurance, or health benefit plan for an individual appointed for a term of one year or less, which could be extended for no more than one additional year, may be made or reimbursed from appropriations available to the Department.]

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**STEVENSON-WYDLER TECHNOLOGY INNOVATION ACT  
OF 1980**

\* \* \* \* \*

**SEC. 12. COOPERATIVE RESEARCH AND DEVELOPMENT AGREEMENTS.**

(a) \* \* \*

(b) ENUMERATED AUTHORITY.—(1) \* \* \*

\* \* \* \* \*

(5) A Government-owned, contractor-operated laboratory that enters into a cooperative research and development agreement pursuant to subsection (a)(1) may use or obligate royalties or other income accruing to the laboratory under such agreement with respect to any invention only—

(A) \* \* \*

\* \* \* \* \*

[(C) for scientific research and development consistent with the research and development missions and objectives of the laboratory.]

(C) for scientific research and development and for educational assistance consistent with the missions and objectives of the Department of Energy and the laboratory.

\* \* \* \* \*

**SEC. 14. DISTRIBUTION OF ROYALTIES RECEIVED BY FEDERAL AGENCIES.**

(a) IN GENERAL.—(1) Except as provided in paragraphs (2) and (4), any royalties or other payments received by a Federal agency from the licensing and assignment of inventions under agreements entered into by Federal laboratories under section 12, and from the licensing of inventions of Federal laboratories under section 207 of title 35, United States Code, or under any other provision of law, shall be retained by the laboratory which produced the invention and shall be disposed of as follows:

(A) \* \* \*

(B) The balance of the royalties or other payments shall be transferred by the agency to its laboratories, with the majority share of the royalties or other payments from any invention going to the laboratory where the invention occurred. The royalties or other payments so transferred to any laboratory may be used or obligated by that laboratory during the fiscal year in which they are received or during the 2 succeeding fiscal years—

(i) \* \* \*

\* \* \* \* \*

[(v) for scientific research and development consistent with the research and development missions and objectives of the laboratory.]

(v) for scientific research and development and for educational assistance and other purposes consistent with the missions and objectives of the Department of Energy and the laboratory.

\* \* \* \* \*

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**DEPARTMENT OF ENERGY ORGANIZATION ACT**

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\* \* \* \* \*

TITLE II—ESTABLISHMENT OF THE DEPARTMENT

\* \* \* \* \*

ASSISTANT SECRETARIES

SEC. 203. (a) 【There shall be in the Department six Assistant Secretaries】 *Except as provided in section 209, there shall be in the Department seven Assistant Secretaries*, each of whom shall be appointed by the President, by and with the advice and consent of the Senate; who shall be compensated at the rate provided for at level IV of the Executive Schedule under section 5315 of title 5, United States Code; and who shall perform, in accordance with applicable law, such of the functions transferred or delegated to, or vested in, the Secretary as he shall prescribe in accordance with the provisions of this Act. The functions which the Secretary shall assign to the Assistant Secretaries include, but are not limited to, the following:

(1) \* \* \*

\* \* \* \* \*

【OFFICE OF SCIENCE

【SEC. 209. (a) There shall be within the Department an Office of Science to be headed by a Director, who shall be appointed by the President, by and with the advice and consent of the Senate, and who shall be compensated at the rate provided for level IV of the Executive Schedule under section 5315 of title 5, United States Code.

【(b) It shall be the duty and responsibility of the Director—

【(1) to advise the Secretary with respect to the physical research program transferred to the Department from the Energy Research and Development Administration;

【(2) to monitor the Department's energy research and development programs in order to advise the Secretary with respect to any undesirable duplication or gaps in such programs;

【(3) to advise the Secretary with respect to the well-being and management of the multipurpose laboratories under the jurisdiction of the Department, excluding laboratories that constitute part of the nuclear weapons complex;

【(4) to advise the Secretary with respect to education and training activities required for effective short- and long-term basic and applied research activities of the Department;

【(5) to advise the Secretary with respect to grants and other forms of financial assistance required for effective short- and

long-term basic and applied research activities of the Department; and

[(6) to carry out such additional duties assigned to the Office by the Secretary relating to basic and applied research, including but not limited to supervision or support of research activities carried out by any of the Assistant Secretaries designated by section 203 of this Act, as the Secretary considers advantageous.]

OFFICE OF SCIENCE

SEC. 209. (a) *There shall be within the Department an Office of Science, to be headed by an Assistant Secretary of Science, who shall be appointed by the President, by and with the advice and consent of the Senate, and who shall be compensated at the rate provided for level IV of the Executive Schedule under section 5315 of title 5, United States Code.*

(b) *The Assistant Secretary of Science shall be in addition to the Assistant Secretaries provided for under section 203 of this Act.*

(c) *It shall be the duty and responsibility of the Assistant Secretary of Science to carry out the fundamental science and engineering research functions of the Department, including the responsibility for policy and management of such research, as well as other functions vested in the Secretary which he may assign to the Assistant Secretary.*

\* \* \* \* \*

SECTION 5315 OF TITLE 5, UNITED STATES CODE

§ 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.

\* \* \* \* \*

【Assistant Secretaries of Energy (6)】 *Assistant Secretaries of Energy (8).*

\* \* \* \* \*

【Director, Office of Science, Department of Energy.】

\* \* \* \* \*

SECTION 189 OF THE ATOMIC ENERGY ACT OF 1954

SEC. 189. HEARINGS AND JUDICIAL REVIEW.—

a. \* \* \*

b. The following Commission actions shall be subject to judicial review in the manner prescribed in chapter 158 of title 28, United States Code, and chapter 7 of title 5, United States Code:

(1) \* \* \*

\* \* \* \* \*

*(5) Any final order or regulation of the Commission establishing standards to govern nonmilitary energy laboratories owned or operated by the Department of Energy that is issued to implement the Commission's responsibilities under section 202 of the Energy Research, Development, Demonstration, and Commercial Application Act of 2003, and any final determination of the Commission relating to whether a nonmilitary energy laboratory owned or operated by the Department is in compliance with such standards and all applicable Commission regulations or orders.*

#### XVIII. COMMITTEE RECOMMENDATIONS

On April 2, 2003, a quorum being present, the Committee favorably reported H.R. 238, the Energy Research, Development, Demonstration, and Commercial Application Act of 2003, as amended, by a voice vote, and recommended its enactment.

#### XIX. STATEMENT OF GENERAL PERFORMANCE GOALS AND OBJECTIVES

Pursuant to clause 3(c) of House rule XIII, the outcome-related goals of H.R. 238, as enumerated in Section 3, are to be used to guide the conduct of a balanced energy research, development, demonstration, and commercial application portfolio of programs in order to meet the purposes of H.R. 238 under Section 2. Additional goals can be found throughout H.R. 238 including: Section 163 relating to the Plan for Fusion Energy Sciences Program; Section 170B relating to Genomes to Life; Section 170C relating to the Department of Energy Science and Technology Scholarship Program; Section 182 relating to the Matsunaga Act Amendments; Section 198 relating to Interagency Cooperation; and Section 301 relating to the Establishment of a Pilot Program in the Clean School Bus Title.

#### XX. EXCHANGE OF COMMITTEE CORRESPONDENCE

HOUSE OF REPRESENTATIVES,  
COMMITTEE ON SCIENCE,  
*Washington, DC, April 7, 2003.*

Hon. WILLIAM J. TAUZIN,  
*Committee on Energy and Commerce,*  
*House of Representatives, Washington, DC.*

DEAR MR. CHAIRMAN: This letter is intended to put in writing the understandings about jurisdiction that informed our negotiations over the structure and content of H.R. 6, the Energy Policy Act of 2003.

It was agreed that the structure of H.R. 6 has no bearing on future decisions on jurisdiction and that neither our Committee nor yours waived any jurisdictional claim as part of the drafting of H.R. 6. No agreements concerning either the language of H.R. 6 or the placement of any language should be construed as a waiver of either Committee's jurisdictional claims under Rule X or the precedents of the House.

Moreover, our two Committees agreed that both Committees have jurisdiction over the Division of H.R. 6 pertaining to the Hydrogen Initiative and FreedomCAR.

I look forward to continuing to work with you as H.R. 6 moves through the legislative process.

Sincerely,

SHERWOOD L. BOEHLERT,  
*Chairman.*

---

HOUSE OF REPRESENTATIVES,  
COMMITTEE ON ENERGY AND COMMERCE,  
*Washington, DC, April 9, 2003.*

Hon. SHERWOOD L. BOEHLERT,  
*Chairman, Committee on Science, House of Representatives, Rayburn House Office Building, Washington, DC.*

DEAR CHAIRMAN BOEHLERT: Thank you for your letter regarding the discussions our Committees held to draft H.R. 6.

I agree that no agreements concerning either the language of H.R. 6 or the placement of any language should be construed as a waiver of either Committee's jurisdictional claims under Rule X or the precedents of the House.

Moreover, our two Committees agreed that both Committees have jurisdiction over the Division of H.R. 6 pertaining to the Hydrogen Initiative and FreedomCAR.

Sincerely,

W.J. "BILLY" TAUZIN,  
*Chairman.*

---

HOUSE OF REPRESENTATIVES,  
COMMITTEE ON SCIENCE,  
*Washington, DC, April 9, 2003.*

Hon. W.J. "BILLY" TAUZIN,  
*Chairman, Committee on Energy and Commerce, House of Representatives, Washington, DC.*

DEAR CHAIRMAN TAUZIN: On April 8, 2003, you introduced H.R. 1644, a bill to enhance energy conservation and research and development, to provide for security and diversity in the energy supply for the American people. The bill was referred to the Committee on Energy and Commerce, and in addition to the Committee on Science (among others). The bill contains provisions that fall within the jurisdiction of the Committee on Science.

In deference to your desire to bring this legislation before the House in an expeditious manner as part of H.R. 6, the "the Energy Policy Act of 2003," I will not exercise this Committee's right to consider H.R. 1644. Despite waiving its consideration of H.R. 1644, the Science Committee does not waive its jurisdiction over H.R. 1644. Additionally, the Science Committee expressly reserves its authority to seek conferees on any provisions that are within its jurisdiction during any House-Senate conference that may be convened on this legislation or like provisions in H.R. 6 or similar legislation which falls within the Science Committee's jurisdiction. I ask for your commitment to support any request by the Science

Committee for conferees on H.R. 1644 as well as any similar or related legislation including, but not limited to H.R. 6.

I request that you include this letter as part of the Record during consideration of the legislation on the House floor.

Thank you for your consideration and attention regarding these matters.

Sincerely,

SHERWOOD L. BOEHLERT,  
*Chairman.*

## XXI. ADDITIONAL VIEW

The Statement of Administration Policy (SAP) of May 8, 2003 for the Senate version of this legislation contains the following two unfortunate sentences that cannot be ignored. “Several provisions including sections 931, 987, and 1005, provide certain preferences based on the recipient’s race. These provisions should be revised to apply only to the extent consistent with affording equal protection of the laws, as required by the Due Process Clause of the Fifth Amendment to the Constitution.” The White House could not be more inaccurate.

The provisions in question are mainstream. One refers to the Section 8A loan program of the Small Business Administration. The other two help reverse under-representation of some groups in our society in the fields of science and technology. I myself authored one similar amendment during our Committee’s consideration of HR 4 that was so non-controversial that it was accepted by voice vote. Similar language was approved by the House and the Senate last year. The Congress has consistently gone on record preserving this type of outreach—in landmark legislation such as TEA-21, and more recently in the Nanotechnology Research and Development Act of 2003. Such provisions ensure that under-represented groups and institutions are included in federal programs, instead of excluded, which has too often been the case.

Whoever wrote the SAP words for the Administration either does not understand the last 50 years of judicial interpretation of equal protection or else wants to turn back the clock. I, therefore, feel compelled to take this opportunity now to answer this vaguely articulated constitutional challenge.

These provisions state the obvious; there are populations and classifications of academic institutions that have historically been under-represented in the field of energy-related scientific research. We know that our academic and research institutions were not insulated from the past record of racial and gender discrimination that was once pervasive and widely accepted throughout this country. We can all be gratified by the fact that much progress has been achieved in the area of equal opportunity. However, we must also acknowledge that past discrimination has resulted in a clear and undeniable under-representation of minority students (including women) both within the science-related professions and within the academic institutions and facilities where our cutting edge research occurs, and where students receive professional training in the Science.

If we do not correct the mistakes of the past, they will continue. Therefore, I commend my colleagues for looking beyond simplistic interpretations of equal protection and equal opportunity and casting their votes in a forward-thinking manner.

SHEILA JACKSON-LEE.

**XXII. PROCEEDINGS OF THE FULL COMMITTEE MARKUP ON H.R. 238, ENERGY RESEARCH, DEVELOPMENT, DEMONSTRATION, AND COMMERCIAL APPLICATION ACT OF 2003**

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**WEDNESDAY, APRIL 2, 2003**

HOUSE OF REPRESENTATIVES,  
COMMITTEE ON SCIENCE,  
*Washington, DC.*

The Committee met, pursuant to call, at 3:00 p.m., in Room 2318 of the Rayburn House Office Building, Hon. Sherwood L. Boehlert [Chairman of the Committee] presiding.

## COMMITTEE ON SCIENCE - FULL COMMITTEE MARKUP - APRIL 2, 2003

## AMENDMENT ROSTER

H.R. 238, Energy Research, Development, Demonstration, and Commercial Application Act of 2003.

--Motion to adopt the bill, as amended: agreed to by a voice vote.

--Motion to report the bill, as amended: agreed to by a voice vote.

No.	Sponsor	Description	Results
1.	Mr. Miller	Amendment would allow DOE to make grants to nonprofit institutions to establish a nationwide network of Advanced Energy Technology Transfer Centers.	--Adopted by a voice vote.
2.	Mr. Matheson	Amendment would add a new section to the bill on demonstration and field test of distributed generation systems.	Unanimous consent request to include amendment as part of the En Bloc was agreed to.
3.	Mr. Udall	Amendment would add a new section to the bill on Federal Laboratory Educational Partners.	--Adopted by a voice vote.
4.	Mr. Costello and Mr. Calvert	Amendment would add a new section to the bill providing for NRC and OSHA to regulate nuclear and worker safety and health as of 24 months after enactment of this Act; DOE would no longer regulate its nonmilitary energy laboratories.	--Adopted by a voice vote.
5.	Mrs. Biggert and Mr. Davis	Amendment would authorize funding for Genomes to Life program.	--Adopted by a voice vote.
6.	Mr. Rohrabacher	Amendment would authorize funding for DOE Energy Science and Technology Scholarship program.	--Adopted by a voice vote.
7.	Ms. Jackson Lee	Amendment would add a new section to the bill on interagency cooperation between DOE and NASA.	--Adopted by a voice vote.
8.	Mr. Udall	Amendment would add a new Subtitle to the bill - Global Change Research and Data Management.	Withdrawn.
9.	Mr. Boehlert and Mr. Hall	En Bloc Amendments to H.R. 238.	--Adopted by a voice vote.

10.	Mr. Wu	Amendment would direct the Secretary of Energy to work with NIST, IEEE, and other standard development organizations to develop voluntary consensus standards for distributed energy systems.	Unanimous consent request to include amendment as part of the En Bloc was agreed to.
11.	Ms. Eddie Bernice Johnson	Amendment would establish a timeframe for the safe and convenient commercial production and delivery of hydrogen.	Unanimous consent request to include amendment as part of the En Bloc was agreed to.
12.	Mr. Sherman and Mr. Bell	Amendment would establish a program to identify societal and ethical concerns related to nanotechnology research.	--Adopted, as amended, by a voice vote.  Unanimous consent request to include amendment as part of the En Bloc was agreed to.

Chairman BOEHLERT. The Committee on Science is meeting today to consider the following measure, H.R. 238, *Energy Research, Development, Demonstration, and Commercial Application Act of 2003*. I ask unanimous consent for the authority to recess the Committee at any point, and without objection, it is so ordered. I ask unanimous consent that the Subcommittee on Energy be discharged from further consideration of H.R. 238 and ask for its immediate consideration at full committee, and without objection, it is so ordered.

We will now consider the bill H.R. 238. It is a pleasure to welcome everyone here for today's markup on this vitally important bill.

As was the case with the Energy Bill in the last Congress, the Science Committee has put together a package that is bipartisan, comprehensive, forward thinking, and balanced. What else would you expect from this great Committee? It should be a model for the larger energy package into which it will be incorporated this weekend. This—that package will be brought to the Floor, hopefully, next week.

Our starting point today is H.R. 238, which I introduced along with Mr. Hall, during the first week of this Congress. The language in the bill is the text of the tentative bipartisan agreement that was reached last year between the House and Senate conferees on the research and development title of H.R. 4.

A lot of work went into that agreement, and it was fair and balanced, promoting R&D in energy efficiency, and renewables, and nuclear and fossil fuels, as well as basic research in the Office of Science. It included major initiatives, such as the new ultra-deep drilling program, a favorite of our Distinguished Ranking Member, and landmark compromise on the Clean Coal Program to ensure that it actually leads to true emissions reduction. And in that regard, I wish to especially note the cooperative attitude of Mr. Costello as we worked together to fashion something that will do this committee proud. So I am pleased that last year's agreement is the foundation of what we'll be reporting out today.

But there have been important developments since the energy conference folded last November. So we have spent the last few weeks arduously—and this is a staff operation, and the staff I can't compliment highly enough, both the majority and the minority staff. They worked while oftentimes—we worked, too, but were doing other things. We have spent the last few weeks negotiating changes to H.R. 238 and those changes are encompassed in the en bloc amendment that I will bringing—be bringing forward with Mr. Hall today. Our partnership continues.

There is a lot in the en bloc amendment, as we will hear later. It contains proposals that were put forward by numerous Members on both sides of the aisle, but let me focus now on the two primary elements of the amendment.

First, it authorizes U.S. participation in the ITER, the international fusion experiment, with strict limitations to ensure that the U.S. financial exposure will be limited and to allow Congress to revisit the issue again before we move forward in earnest. This is especially vital, because the U.S. fusion community does not want to participate in ITER if doing so will reduce funding for do-

mestic fusion programs. And that principle is embodied in this bill and will also be included in the report that accompanies the bill.

Personally, I doubt that we will be able to fund ITER without cutting into our existing fusion programs, so we are going to have to examine our choices carefully when we have complete information on what ITER participation would mean. This bill will ensure that we get that information in a timely manner that enables us to make thoughtful decisions.

I want to thank Ms. Lofgren and Mr. Nethercutt, two tireless advocates for fusion, for working with us on this language.

The en bloc amendment also authorizes the President's Hydrogen Initiative and the related FreedomCAR program at the funding levels requested by the President. Our language fleshes out the areas of R&D the Initiative must cover; requires more extensive planning; and will ensure that demonstration projects actually help move us toward a transition to a hydrogen economy. This language will be one of the things that this bill is remembered for.

The en bloc also increases funding for the Office of Science, something Mrs. Biggert has strongly advocated, and a step that is essential if we are to adequately fund the physical sciences.

Members will offer a number of other amendments today, most of which have been negotiated between the majority and the minority; a few of them I may feel constrained to oppose, depending on how they are explained. But I know that we will end on a note of unity, as this committee always has.

We will bring to the Floor a bill that looks across the forms of energy to ensure that the U.S. has a secure energy future in the decades to come. We are determined to contribute to the development of a responsible energy policy for the Nation, something that has been sorely lacking for far too long.

[The prepared statement of Mr. Boehlert follows:]

PREPARED STATEMENT OF CHAIRMAN SHERWOOD BOEHLERT

It's a pleasure to welcome everyone here for today's markup on this vitally important bill.

As was the case with the Energy Bill in the last Congress, the Science Committee has put together a package that is bipartisan, comprehensive, forward-thinking and balanced. It should be a model for the larger energy package into which it will be incorporated this weekend. That package will be brought to the floor next week.

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A lot of work went into that agreement, and it was fair and balanced, promoting R&D in energy efficiency and renewables, and nuclear and fossil fuels, as well as basic research in the Office of Science. It included major initiatives, such as the new ultra-deep drilling program and landmark compromise on the Clean Coal Program to ensure that it actually leads to true emissions reductions. So I'm pleased that last year's agreement is the foundation of what we'll be reporting out today.

But there have been important developments since the energy conference folded last November. So we've spent the last few weeks arduously negotiating changes to H.R. 238 to update the bill, and those changes are encompassed in the en bloc amendment that I will be bringing forward with Mr. Hall today. Our partnership continues.

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ited and to allow Congress to revisit the issue again before we move forward in earnest. This is especially vital because the U.S. fusion community does not want to participate in ITER if doing so will reduce funding for domestic fusion programs—and that principle is embodied in this bill, and will also be included in the report that accompanies the bill.

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The en bloc also increases funding for the Office of Science, something Mrs. Biggert has strongly advocated, and a step that is essential if we are to adequately fund the physical sciences.

Members will offer a number of other amendments today—most of which have been negotiated between the majority and minority; a few others I will oppose. But I know that we will end on a note of unity, as this committee always has.

We will bring to the floor a bill that looks across all the forms of energy to ensure that the U.S. has a secure energy future in the decades to come.

Mr. Hall.

Chairman BOEHLERT. Now with Mr. Hall absent, is there someone who wishes to claim—we will come back to him. All right. We will come back to him. No. All right.

Now without objection, all Members may place opening statements in the record at this point. I ask unanimous consent that the bill will—well, wait a minute. The bill is—where are we? Ask unanimous consent that the bill be considered as read and open to amendment at any point.

[The prepared statement of Mr. Costello follows:]

PREPARED STATEMENT OF REPRESENTATIVE JERRY F. COSTELLO

Mr. Chairman, I want to thank the Chairman for working with me on the clean coal provisions included in the bill. A reliable and affordable energy supply is crucial to America's economic vitality, security, and quality of life. Congress can help achieve this goal by passing balanced, comprehensive energy legislation that promotes energy conservation and efficiency; increases the use of all domestic energy resources, including coal; improves energy infrastructure; and promotes the development of advanced energy technologies. New and improved technologies hold the promise of far greater emissions reductions and increased efficiency.

The clean coal agreement included in the manager's en bloc amendment will assist in burning coal more efficiently and cleanly. The clean coal technology initiative encourages development of new technologies for cleaner, higher efficiency coal combustion in new and established plants with the hope of achieving a healthier environment while maintaining jobs.

[The prepared statement of Ms. Lofgren follows:]

PREPARED STATEMENT OF REPRESENTATIVE ZOE LOFGREN

I am pleased that the Committee's en bloc amendment contains the spirit and most of the letter of the FUTURE Act, which was introduced by myself, Congressman Nethercutt, and over 30 bipartisan Members of the House.

I introduced this legislation because I believe it is essential for this nation and the international community to pursue fusion as aggressively. Fusion research has shown dramatic progress over the past decade, and we are now ready to take the next major step toward a demonstration. The bill recognizes this and as I will explain, positions the U.S. to take advantage of this fact.

Fusion powers the sun and if our scientists and engineers can harness it here on earth, we will have an environmentally friendly, safe and virtually unlimited source of energy which no nation will monopolize.

Yet, practical fusion energy is not guaranteed: it is probably the most difficult scientific and technological challenge ever undertaken. So obviously, there are some uncertainties. However, when you contemplate just how few and uncertain our future energy options are, aggressively pursuing fusion is utterly compelling.

Further, when you think about what we are paying today in terms of human lives and dollars for an energy policy that is so heavily reliant on imported oil, it seems self-evident that we must pursue this aggressively almost no matter what the cost or risk.

Let me cite just one statistic: we spend more money importing oil into this country every day than we do every year on fusion research, well over \$250 million per day!

So, what will the Committee's bill accomplish? First, the bill authorizes the Department of Energy to fully participate in the International Thermonuclear Experimental Reactor (ITER) project. ITER is a next step fusion project that will effectively cap off the science and much of the technology necessary to move ahead and build a demonstration of a first generation fusion energy project. Negotiations to determine the financing and site selection of ITER are now moving forward between Europe, Japan, Russia, Canada, China and now South Korea. Earlier this year, the President announced that the U.S. should join these negotiations.

While the bill authorizes the U.S. to join the project should these negotiations be successful, it contains provisions and protections to help ensure that U.S. negotiators will strike a "good deal" for the U.S. A "good deal" for the U.S. must position the U.S. to provide maximum benefit for our domestic fusion energy research program.

To this end, the bill authorizes increases in our fusion energy science budget. Over the next four years, the bill provides about 40 percent increase in funding for the Department of Energy's fusion science budget. The Fiscal Year (FY) 2003 budget was about \$250 million. FY 2004 starts at \$276 million and ends at \$350 million in FY 2007. Specifically, the increases break down the following way: FY 2004, \$276 million; FY 2005, \$300 million; FY 2006, \$340 million and in FY 2007, \$350 million.

The Committee also authorized its separate funding for ITER. ITER is funded in FY 2004 at \$12 million, FY 2005 at \$20 million, FY 2006 at \$50 million and FY 2007 at \$75 million dollars. In addition, the bill requires the Department of Energy to deliver a plan to Congress to ensure that the U.S. research and industrial communities are competitive with those of other nations when it comes to providing fusion energy for our own needs and those of other nations.

The bill directs the Department of Energy to plan how to address issues of fusion materials and fusion technologies that are key to practical fusion energy.

Finally, I want to emphasize that by authorizing separate funding for the ITER project, the bill sends the unmistakable signal that ITER funding is not to come from the already underfunded domestic research effort.

I want to thank Chairman Boehlert, Congressman Hall, Congressman Nethercutt and several other Members of the Committee who are cosponsors of Hr 1282 and the staffs on both sides of the aisle for their support and hard work on this issue.

[H.R. 238 follows:]

108TH CONGRESS  
1ST SESSION

## H. R. 238

To provide for Federal energy research, development, demonstration, and commercial application activities, and for other purposes.

IN THE HOUSE OF REPRESENTATIVES

JANUARY 8, 2003

Mr. BOEHLERT (for himself and Mr. HALL) introduced the following bill; which was referred to the Committee on Science, and in addition to the Committee on Resources, 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 provide for Federal energy research, development, demonstration, and commercial application activities, and for other purposes.

*Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,*

#### SECTION 1. SHORT TITLE.

This Act may be cited as the “Energy Research, Development, Demonstration, and Commercial Application Act of 2003”.

## TITLE I—RESEARCH AND DEVELOPMENT

#### SEC. 101. PURPOSES.

The purposes of this title are to——

- (1) contribute to a national energy strategy through an energy research and development program that supports basic energy research and provides mechanisms to develop, demonstrate, and promote the commercial application of new energy technologies in partnership with industry;
- (2) protect and strengthen the Nation’s economy, standard of living, and national security by reducing dependence on imported energy;
- (3) meet future needs for energy services at the lowest total cost to the Nation, giving balanced and comprehensive consideration to technologies that improve the efficiency of energy end uses and that enhance energy supply;
- (4) reduce the environmental impacts of energy production, distribution, transportation, and use;
- (5) help increase domestic production of energy, increase the availability of hydrocarbon reserves, and lower energy prices; and
- (6) stimulate economic growth and enhance the ability of United States companies to compete in future markets for advanced energy technologies.

#### SEC. 102. GOALS.

(a) IN GENERAL.—In order to achieve the purposes of this title, the Secretary shall conduct a balanced set of programs of energy research, development, demonstration, and commercial application, guided by the following goals:

##### (1) ENERGY EFFICIENCY.—

(A) BUILDINGS.—Develop, in partnership with industry, technologies, designs, and production methods that will enable an average 25 percent increase by 2010 in the energy efficiency of all new buildings, as compared to a new building in 1996.

(B) INDUSTRY.—Develop, in partnership with industry, technologies, designs, and production methods that will enable the energy intensity of the major energy-consuming industries to improve by at least 25 percent by 2010 as compared to 1991.

(C) VEHICLES.—Develop, in partnership with industry, technologies that will enable——

- (i) by 2010, mid-sized passenger automobiles with a fuel economy of 80 miles per gallon;
  - (ii) by 2010, light trucks (classes 1 and 2a) with a fuel economy of 60 miles per gallon;
  - (iii) by 2010, medium trucks and buses (classes 2b through 6 and class 8 transit buses) with a fuel economy, in ton-miles per gallon for trucks and passenger miles per gallon for buses, that is 3 times that of year 2000 equivalent vehicles;
  - (iv) by 2010, heavy trucks (classes 7 and 8) with a fuel economy, in ton-miles per gallon, that is 2 times that of year 2000 equivalent vehicles; and
  - (v) by 2015, mid-sized fuel cell powered passenger vehicles with a gasoline equivalent fuel economy of 110 miles per gallon.
- (2) DISTRIBUTED ENERGY AND ELECTRIC ENERGY SYSTEMS.—
- (A) DISTRIBUTED GENERATION.—Develop, in partnership with industry, technologies based on natural gas that achieve electricity generating efficiencies greater than 40 percent by 2015 for on-site, or distributed, generation technologies.
  - (B) ELECTRIC ENERGY SYSTEMS AND STORAGE.—Develop, in partnership with industry—
    - (i) technologies for generators and transmission, distribution, and storage systems that combine high capacity with high efficiency (particularly for electric transmission facilities in rural and remote areas);
    - (ii) new transmission and distribution technologies, including flexible alternating current transmission systems, composite conductor materials, advanced protection devices, and controllers;
    - (iii) technologies for interconnection of distributed energy resources with electric power systems;
    - (iv) high-temperature superconducting materials for power delivery equipment such as transmission and distribution cables, transformers, and generators; and
    - (v) real-time transmission and distribution system control technologies that provide for continual exchange of information between generation, transmission, distribution, and end-user facilities.
- (3) RENEWABLE ENERGY.—
- (A) WIND POWER.—Develop, in partnership with industry, technologies and designs that will—
    - (i) reduce the cost of wind power by 40 percent by 2007 as compared to 2000; and
    - (ii) expand utilization of class 3 and 4 winds.
  - (B) PHOTOVOLTAICS.—Develop, in partnership with industry, total photovoltaic systems with installed costs of \$4000 per peak kilowatt by 2005 and \$2000 per peak kilowatt by 2015.
  - (C) SOLAR THERMAL ELECTRIC SYSTEMS.—Develop, in partnership with industry, solar power technologies (including baseload solar power) that combine high-efficiency and high-temperature receivers with advanced thermal storage and power cycles to accommodate peak loads and reduce lifecycle costs.
  - (D) GEOTHERMAL ENERGY.—Develop, in partnership with industry, technologies and processes based on advanced hydrothermal systems and advanced heat and power systems, including geothermal or ground source heat pump technology, with a specific focus on—
    - (i) improving exploration and characterization technology to increase the probability of drilling successful wells from 20 percent to 40 percent by 2006;
    - (ii) reducing the cost of drilling by 2008 to an average cost of \$150 per foot; and
    - (iii) developing enhanced geothermal systems technology with the potential to double the usable geothermal resource base, as compared to the date of enactment of this Act.
  - (E) HYDROGEN.—Carry out the Spark M. Matsunaga Hydrogen Research, Development, and Demonstration Act of 1990 and title II of the Hydrogen Future Act of 1996, as amended by this Act.
  - (F) BIOMASS-BASED POWER SYSTEMS.—Develop, in partnership with industry, integrated power generating systems, advanced conversion, and feedstock technologies capable of producing electric power that is cost-competitive with fossil-fuel generated electricity by 2010, through co-production of fuels, chemicals, and other products under subparagraph (G).

(G) BIOFUELS.—Develop, in partnership with industry, new and emerging technologies and biotechnology processes capable of making——

(i) gaseous and liquid biofuels that are price-competitive, by 2010, with gasoline or diesel in either internal combustion engines or fuel cells; and

(ii) biofuels, biobased polymers, and chemicals, including those derived from lignocellulosic feedstock, with particular emphasis on developing biorefineries that use enzyme-based processing systems.

(H) HYDROPOWER.—Develop, in partnership with industry, a new generation of turbine technologies that will increase generating capacity and be less damaging to fish and aquatic ecosystems.

(4) FOSSIL ENERGY.——

(A) POWER GENERATION.—Develop, in partnership with industry, technologies, including precombustion technologies, by 2015 with the capability of realizing——

(i) electricity generating efficiencies of 75 percent (lower heating value) for natural gas; and

(ii) widespread commercial application of combined heat and power with thermal efficiencies of more than 85 percent (higher heating value).

(B) OFFSHORE OIL AND GAS RESOURCES.—Develop, in partnership with industry, technologies to——

(i) extract methane hydrates in coastal waters of the United States; and

(ii) develop natural gas and oil reserves in the ultra-deepwater of the Central and Western Gulf of Mexico, with a focus on improving, while lowering costs and reducing environmental impacts, the safety and efficiency of——

(I) the recovery of ultra-deepwater resources; and

(II) sub-sea production technology used for such recovery.

(C) ONSHORE OIL AND GAS RESOURCES.—Advance the science and technology available to domestic onshore petroleum producers, particularly independent producers of oil or gas, through——

(i) advances in technology for exploration and production of domestic petroleum resources, particularly those not accessible with current technology;

(ii) improvement in the ability to extract hydrocarbons (including heavy oil) from known reservoirs and classes of reservoirs; and

(iii) development of technologies and practices that reduce the impact on the environment from petroleum exploration and production.

(D) TRANSPORTATION FUELS.—Increase the availability of transportation fuels by focusing research on——

(i) reducing the cost of producing transportation fuels from coal and natural gas; and

(ii) indirect liquefaction of coal and biomass.

(5) NUCLEAR ENERGY.——

(A) EXISTING REACTORS.—Support research to extend the lifetimes of existing United States nuclear power reactors, and increase their reliability while optimizing their current operations for greater efficiencies.

(B) ADVANCED REACTORS.—Develop, in partnership with industry——

(i) advanced, efficient, lower cost, and passively safe reactor designs;

(ii) proliferation-resistant and high-burn-up nuclear fuels; and

(iii) technologies to minimize generation of radioactive materials and improve the management of nuclear waste.

(C) NUCLEAR SCIENTISTS AND ENGINEERS.—Attract new students and faculty to the nuclear sciences, nuclear engineering, and related fields (including health physics, nuclear medicine, nuclear chemistry, and radiochemistry).

(b) REVIEW AND ASSESSMENT OF GOALS.——

(1) EVALUATION AND MODIFICATION.—Based on amounts appropriated and developments in science and technology, the Secretary shall evaluate the goals set forth in subsection (a) at least once every 5 years, and shall report to the Congress any proposed modifications to the goals.

(2) CONSULTATION.—In evaluating and proposing modifications to the goals as provided in paragraph (1), the Secretary shall solicit public input.

(3) PUBLIC COMMENT.—(A) After consultation under paragraph (2), the Secretary shall publish in the Federal Register a set of draft modifications to the goals for public comment.

(B) Not later than 60 days after the date of publication of draft modifications under subparagraph (A), and after consideration of any public comments received, the Secretary shall publish the final modifications, including a summary of the public comments received, in the Federal Register.

(4) EFFECTIVE DATE.—No modification to goals under this section shall take effect before the date which is 5 years after the date of enactment of this Act.

(c) EFFECT OF GOALS.—(1) Nothing in paragraphs (1) through (5) of subsection (a), or any subsequent modification to the goals therein pursuant to subsection (b), shall—

(A) create any new—

(i) authority for any Federal agency; or

(ii) requirement for any other person;

(B) be used by a Federal agency to support the establishment of regulatory standards or regulatory requirements; or

(C) alter the authority of the Secretary to make grants or other awards.

(2) Nothing in this subsection shall be construed to limit the authority of the Secretary to impose conditions on grants or other awards based on the goals in subsection (a) or any subsequent modification thereto.

#### SEC. 103. DEFINITIONS.

For purposes of this title:

(1) DEPARTMENT.—The term “Department” means the Department of Energy.

(2) DEPARTMENTAL MISSION.—The term “departmental mission” means any of the functions vested in the Secretary of Energy by the Department of Energy Organization Act (42 U.S.C. 7101 et seq.) or other law.

(3) INDEPENDENT PRODUCER OF OIL OR GAS.—

(A) IN GENERAL.—The term “independent producer of oil or gas” means any person who produces oil or gas other than a person to whom subsection (c) of section 613A of the Internal Revenue Code of 1986 does not apply by reason of paragraph (2) (relating to certain retailers) or paragraph (4) (relating to certain refiners) of section 613A(d) of such Code.

(B) RULES FOR APPLYING PARAGRAPHS (2) AND (4) OF SECTION 613A(d).—

For purposes of subparagraph (A), paragraphs (2) and (4) of section 613A(d) of the Internal Revenue Code of 1986 shall be applied by substituting “calendar year” for “taxable year” each place it appears in such paragraphs.

(4) 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)).

(5) JOINT VENTURE.—The term “joint venture” has the meaning given that term under section 2 of the National Cooperative Research and Production Act of 1993 (15 U.S.C. 4301).

(6) NATIONAL LABORATORY.—The term “National Laboratory” means any of the following laboratories owned by the Department:

(A) Ames National Laboratory.

(B) Argonne National Laboratory.

(C) Brookhaven National Laboratory.

(D) Fermi National Laboratory.

(E) Idaho National Engineering and Environmental Laboratory.

(F) Lawrence Berkeley National Laboratory.

(G) Lawrence Livermore National Laboratory.

(H) Los Alamos National Laboratory.

(I) National Energy Technology Laboratory.

(J) National Renewable Energy Laboratory.

(K) Oak Ridge National Laboratory.

(L) Pacific Northwest National Laboratory.

(M) Princeton Plasma Physics Laboratory.

(N) Sandia National Laboratories.

(O) Thomas Jefferson National Accelerator Facility.

(7) NONMILITARY ENERGY LABORATORY.—The term “nonmilitary energy laboratory” means any of the following laboratories of the Department:

(A) Ames National Laboratory.

(B) Argonne National Laboratory.

(C) Brookhaven National Laboratory.

(D) Fermi National Laboratory.

- (E) Lawrence Berkeley National Laboratory.
- (F) Oak Ridge National Laboratory.
- (G) Pacific Northwest National Laboratory.
- (H) Princeton Plasma Physics Laboratory.
- (I) Stanford Linear Accelerator Center.
- (J) Thomas Jefferson National Accelerator Facility.
- (8) SECRETARY.—The term “Secretary” means the Secretary of Energy.
- (9) SINGLE-PURPOSE RESEARCH FACILITY.—The term “single-purpose research facility” means any of the following primarily single-purpose entities owned by the Department:
  - (A) East Tennessee Technology Park.
  - (B) Environmental Measurement Laboratory.
  - (C) Fernald Environmental Management Project.
  - (D) Kansas City Plant.
  - (E) Nevada Test Site.
  - (F) New Brunswick Laboratory.
  - (G) Pantex Weapons Facility.
  - (H) Savannah River Technology Center.
  - (I) Stanford Linear Accelerator Center.
  - (J) Y-12 facility at Oak Ridge National Laboratory.
  - (K) Waste Isolation Pilot Plant.
  - (L) Any other similar organization of the Department designated by the Secretary that engages in technology transfer, partnering, or licensing activities.

## Subtitle A—Energy Efficiency

### PART 1—AUTHORIZATION OF APPROPRIATIONS

#### SEC. 104. ENERGY EFFICIENCY.

(a) IN GENERAL.—The following sums are authorized to be appropriated to the Secretary for energy efficiency and conservation research, development, demonstration, and commercial application activities, including activities authorized under this subtitle:

- (1) For fiscal year 2003, \$560,000,000.
- (2) For fiscal year 2004, \$616,000,000.
- (3) For fiscal year 2005, \$695,000,000.
- (4) For fiscal year 2006, \$772,000,000.
- (5) For fiscal year 2007, \$865,000,000.

(b) ALLOCATIONS.—From amounts authorized under subsection (a), the following sums are authorized:

(1) LIGHTING SYSTEMS.—For activities under section 105, \$10,000,000 for fiscal year 2003 and \$50,000,000 for each of fiscal years 2004 through 2007.

(2) SECONDARY ELECTRIC VEHICLE BATTERY USE PROGRAM.—For activities under section 108—

- (A) for fiscal year 2003, \$1,000,000;
- (B) for fiscal year 2004, \$4,000,000;
- (C) for fiscal year 2005, \$7,000,000;
- (D) for fiscal year 2006, \$7,000,000; and
- (E) for fiscal year 2007, \$7,000,000.

(3) ENERGY EFFICIENCY SCIENCE INITIATIVE.—For activities under section 110—

- (A) for fiscal year 2003, \$15,000,000;
- (B) for fiscal year 2004, \$20,000,000;
- (C) for fiscal year 2005, \$25,000,000;
- (D) for fiscal year 2006, \$30,000,000; and
- (E) for fiscal year 2007, \$35,000,000.

(c) EXTENDED AUTHORIZATION.—There are authorized to be appropriated to the Secretary for activities under section 105, \$50,000,000 for each of fiscal years 2008 through 2012.

(d) LIMITS ON USE OF FUNDS.—None of the funds authorized to be appropriated under this section may be used for—

- (1) the promulgation and implementation of energy efficiency regulations;
- (2) the Weatherization Assistance Program under part A of title IV of the Energy Conservation and Production Act;

- (3) the State Energy Program under part D of title III of the Energy Policy and Conservation Act; or
- (4) the Federal Energy Management Program under part 3 of title V of the National Energy Conservation Policy Act.

## PART 2—LIGHTING SYSTEMS

### SEC. 105. NEXT GENERATION LIGHTING INITIATIVE.

(a) **IN GENERAL.**—The Secretary shall carry out a Next Generation Lighting Initiative in accordance with this section to support research, development, demonstration, and commercial application activities related to advanced solid-state lighting technologies based on white light emitting diodes.

(b) **OBJECTIVES.**—The objectives of the initiative shall be——

(1) to develop, by 2012, advanced solid-state lighting technologies based on white light emitting diodes that, compared to incandescent and fluorescent lighting technologies, are——

- (A) longer lasting;
- (B) more energy-efficient; and
- (C) cost-competitive;

(2) to develop an inorganic white light emitting diode that has an efficiency of 160 lumens per watt and a 10-year lifetime; and

(3) to develop an organic white light emitting diode with an efficiency of 100 lumens per watt with a 5-year lifetime that——

- (A) illuminates over a full color spectrum;
- (B) covers large areas over flexible surfaces; and
- (C) does not contain harmful pollutants, such as mercury, typical of fluorescent lamps.

(c) **FUNDAMENTAL RESEARCH.**——

(1) **CONSORTIUM.**—The Secretary shall carry out the fundamental research activities of the Next Generation Lighting Initiative through a private consortium (which may include private firms, trade associations and institutions of higher education), which the Secretary shall select through a competitive process. Each proposed consortium shall submit to the Secretary such information as the Secretary may require, including a program plan agreed to by all participants of the consortium.

(2) **JOINT VENTURE.**—The consortium shall be structured as a joint venture among the participants of the consortium. The Secretary shall serve on the governing council of the consortium.

(3) **ELIGIBILITY.**—To be eligible to be selected as the consortium under paragraph (1), an applicant must be broadly representative of United States solid-state lighting research, development, and manufacturing expertise as a whole.

(4) **GRANTS.**—(A) The Secretary shall award grants for fundamental research to the consortium, which the consortium may disburse to researchers, including those who are not participants of the consortium.

(B) To receive a grant, the consortium must provide a description to the Secretary of the proposed research and list the parties that will receive funding.

(C) Grants shall be matched by the consortium pursuant to section 182.

(5) **NATIONAL LABORATORIES.**—National Laboratories may participate in the research described in this section, and may receive funds from the consortium.

(6) **INTELLECTUAL PROPERTY.**—Participants in the consortium and the Federal Government shall have royalty-free nonexclusive rights to use intellectual property derived from research funded pursuant to this subsection.

(d) **DEVELOPMENT, DEMONSTRATION, AND COMMERCIAL APPLICATION.**—The Secretary shall carry out the development, demonstration, and commercial application activities of the Next Generation Lighting Initiative through awards to private firms, trade associations, and institutions of higher education. In selecting awardees, the Secretary may give preference to members of the consortium selected pursuant to subsection (c).

(e) **PLANS AND ASSESSMENTS.**—(1) The consortium shall formulate an annual operating plan which shall include research priorities, technical milestones, and plans for technology transfer, and which shall be subject to approval by the Secretary.

(2) The Secretary shall enter into an arrangement with the National Academy of Sciences to conduct periodic reviews of the Next Generation Lighting Initiative. The Academy shall review the research priorities, technical milestones, and plans for technology transfer established under paragraph (1) and evaluate the progress toward achieving them. The Secretary shall consider the results of such reviews in evaluating the plans submitted under paragraph (1).

(f) **AUDIT.**—The Secretary shall retain an independent, commercial auditor to perform an audit of the consortium to determine the extent to which the funds authorized by this section have been expended in a manner consistent with the purposes of this section. The auditor shall transmit a report annually to the Secretary, who shall transmit the report to the Congress, along with a plan to remedy any deficiencies cited in the report.

(g) **SUNSET.**—The Next Generation Lighting Initiative shall terminate no later than September 30, 2013.

(h) **DEFINITIONS.**—As used in this section:

(1) **ADVANCED SOLID-STATE LIGHTING.**—The term “advanced solid-state lighting” means a semiconducting device package and delivery system that produces white light using externally applied voltage.

(2) **FUNDAMENTAL RESEARCH.**—The term “fundamental research” includes basic research on both solid-state materials and manufacturing processes.

(3) **INORGANIC WHITE LIGHT EMITTING DIODE.**—The term “inorganic white light emitting diode” means an inorganic semiconducting package that produces white light using externally applied voltage.

(4) **ORGANIC WHITE LIGHT EMITTING DIODE.**—The term “organic white light emitting diode” means an organic semiconducting compound that produces white light using externally applied voltage.

## **PART 3—BUILDINGS**

### **SEC. 106. NATIONAL BUILDING PERFORMANCE INITIATIVE.**

(a) **INTERAGENCY GROUP.**—Not later than 3 months after the date of enactment of this Act, the Director of the Office of Science and Technology Policy shall establish an interagency group to develop, in coordination with the advisory committee established under subsection (e), a National Building Performance Initiative (in this section referred to as the “Initiative”). The interagency group shall be cochaired by appropriate officials of the Department and the Department of Commerce, who shall jointly arrange for the provision of necessary administrative support to the group.

(b) **INTEGRATION OF EFFORTS.**—The Initiative shall integrate Federal, State, and voluntary private sector efforts to reduce the costs of construction, operation, maintenance, and renovation of commercial, industrial, institutional, and residential buildings.

(c) **PLAN.**—Not later than 1 year after the date of enactment of this Act, the interagency group shall submit to Congress a plan for carrying out the appropriate Federal role in the Initiative. The plan shall include—

(1) research, development, demonstration, and commercial application of systems and materials for new construction and retrofit relating to the building envelope and building system components; and

(2) the collection, analysis, and dissemination of research results and other pertinent information on enhancing building performance to industry, government entities, and the public.

(d) **DEPARTMENT OF ENERGY ROLE.**—Within the Federal portion of the Initiative, the Department shall be the lead agency for all aspects of building performance related to use and conservation of energy.

(e) **ADVISORY COMMITTEE.**—

(1) **ESTABLISHMENT.**—The Director of the Office of Science and Technology Policy shall establish an advisory committee to—

(A) analyze and provide recommendations on potential private sector roles and participation in the Initiative; and

(B) review and provide recommendations on the plan described in subsection (c).

(2) **MEMBERSHIP.**—Membership of the advisory committee shall include representatives with a broad range of appropriate expertise, including expertise in—

(A) building research and technology;

(B) architecture, engineering, and building materials and systems; and

(C) the residential, commercial, and industrial sectors of the construction industry.

(f) **CONSTRUCTION.**—Nothing in this section provides any Federal agency with new authority to regulate building performance.

## PART 4—VEHICLES

### SEC. 107. DEFINITIONS.

For purposes of this part, the term——

(1) “battery” means an energy storage device that previously has been used to provide motive power in a vehicle powered in whole or in part by electricity; and

(2) “associated equipment” means equipment located where the batteries will be used that is necessary to enable the use of the energy stored in the batteries.

### SEC. 108. ESTABLISHMENT OF SECONDARY ELECTRIC VEHICLE BATTERY USE PROGRAM.

(a) PROGRAM.—The Secretary shall establish and conduct a research, development, demonstration, and commercial application program for the secondary use of batteries. Such program shall be——

(1) designed to demonstrate the use of batteries in secondary application, including utility and commercial power storage and power quality;

(2) structured to evaluate the performance, including useful service life and costs, of such batteries in field operations, and evaluate the necessary supporting infrastructure, including reuse and disposal of batteries; and

(3) coordinated with ongoing secondary battery use programs at the National Laboratories and in industry.

(b) SOLICITATION.—(1) Not later than 6 months after the date of the enactment of this Act, the Secretary shall solicit proposals to demonstrate the secondary use of batteries and associated equipment and supporting infrastructure in geographic locations throughout the United States. The Secretary may make additional solicitations for proposals if the Secretary determines that such solicitations are necessary to carry out this section.

(2)(A) Proposals submitted in response to a solicitation under this section shall include——

(i) a description of the project, including the batteries to be used in the project, the proposed locations and applications for the batteries, the number of batteries to be demonstrated, and the type, characteristics, and estimated life-cycle costs of the batteries compared to other energy storage devices currently used;

(ii) the contribution, if any, of State or local governments and other persons to the demonstration project;

(iii) the type of associated equipment and supporting infrastructure to be demonstrated; and

(iv) any other information the Secretary considers appropriate.

(B) If the proposal includes a lease arrangement, the proposal shall indicate the terms of such lease arrangement for the batteries and associated equipment.

(c) SELECTION OF PROPOSALS.—(1)(A) The Secretary shall, not later than 3 months after the closing date established by the Secretary for receipt of proposals under subsection (b), select at least 5 proposals to receive financial assistance under this section.

(B) No one project selected under this section shall receive more than 25 percent of the funds authorized under this section. No more than 3 projects selected under this section shall demonstrate the same battery type.

(2) In selecting a proposal under this section, the Secretary shall consider——

(A) the ability of the proposer to acquire the batteries and associated equipment and to successfully manage and conduct the demonstration project, including satisfying the reporting requirements set forth in paragraph (3)(B);

(B) the geographic and climatic diversity of the projects selected;

(C) the long-term technical and competitive viability of the batteries to be used in the project and of the original manufacturer of such batteries;

(D) the suitability of the batteries for their intended uses;

(E) the technical performance of the batteries, including the expected additional useful life and the batteries’ ability to retain energy;

(F) the environmental effects of the use of and disposal of the batteries proposed to be used in the project selected;

(G) the extent of involvement of State or local government and other persons in the demonstration project and whether such involvement will——

(i) permit a reduction of the Federal cost share per project; or

(ii) otherwise be used to allow the Federal contribution to be provided to demonstrate a greater number of batteries; and

(H) such other criteria as the Secretary considers appropriate.

(3) CONDITIONS.—The Secretary shall require that——

(A) as a part of a demonstration project, the users of the batteries provide to the proposer information regarding the operation, maintenance, performance, and use of the batteries, and the proposer provide such information to the battery manufacturer, for 3 years after the beginning of the demonstration project;

(B) the proposer provide to the Secretary such information regarding the operation, maintenance, performance, and use of the batteries as the Secretary may request;

(C) the proposer provide to the Secretary such information regarding the disposal of the batteries as the Secretary may require to ensure that the proposer disposes of the batteries in accordance with applicable law; and

(D) the proposer provide at least 50 percent of the costs associated with the proposal.

**SEC. 109. ADVANCED VEHICLE TECHNOLOGY.**

The Secretary shall expand research and development programs of the Department related to advanced vehicle technologies, including——

(1) fuel cells, including high temperature membranes for fuel cells and fuel cell auxiliary power systems, and hydrogen storage;

(2) vehicle engine systems and emission control systems;

(3) batteries and power electronics for hybrid vehicles;

(4) combustion and after-treatment technologies for use in direct injected gasoline and diesel fueled motor vehicles; and

(5) other advanced fuels and materials.

## **PART 5—ENERGY EFFICIENCY SCIENCE INITIATIVE**

**SEC. 110. ENERGY EFFICIENCY SCIENCE INITIATIVE.**

(a) ESTABLISHMENT.—The Secretary shall establish an Energy Efficiency Science Initiative to be managed by the Assistant Secretary in the Department with responsibility for energy conservation under section 203(a)(9) of the Department of Energy Organization Act (42 U.S.C. 7133(a)(9)), in consultation with the Director of the Office of Science, for grants to be competitively awarded and subject to peer review for research relating to energy efficiency.

(b) REPORT.—The Secretary shall submit to the Congress, along with the President's annual budget request under section 1105(a) of title 31, United States Code, a report on the activities of the Energy Efficiency Science Initiative, including a description of the process used to award the funds and an explanation of how the research relates to energy efficiency.

## **Subtitle B—Distributed Energy and Electric Energy Systems**

### **PART 1—AUTHORIZATION OF APPROPRIATIONS**

**SEC. 111. DISTRIBUTED ENERGY AND ELECTRIC ENERGY SYSTEMS.**

(a) IN GENERAL.—The following sums are authorized to be appropriated to the Secretary for distributed energy and electric energy systems activities, including activities authorized under this subtitle:

(1) For fiscal year 2003, \$155,000,000.

(2) For fiscal year 2004, \$190,000,000.

(3) For fiscal year 2005, \$200,000,000.

(4) For fiscal year 2006, \$220,000,000.

(5) For fiscal year 2007, \$240,000,000.

(b) MICRO-COGENERATION ENERGY TECHNOLOGY.—From amounts authorized under subsection (a), \$2,000,000 for fiscal year 2003 and \$20,000,000 for fiscal year 2004 shall be available for activities under section 114.

### **PART 2—DISTRIBUTED POWER**

**SEC. 112. STRATEGY.**

(a) REQUIREMENT.—Not later than 1 year after the date of enactment of this Act, the Secretary shall develop and transmit to the Congress a strategy for a com-

prehensive research, development, demonstration, and commercial application program to develop hybrid distributed power systems that combine——

(1) one or more renewable electric power generation technologies of 10 megawatts or less located near the site of electric energy use; and

(2) nonintermittent electric power generation technologies suitable for use in a distributed power system.

(b) CONTENTS.—The strategy shall——

(1) identify the needs best met with such hybrid distributed power systems and the technological barriers to the use of such systems;

(2) provide for the development of methods to design, test, integrate into systems, and operate such hybrid distributed power systems;

(3) include, as appropriate, research, development, demonstration, and commercial application on related technologies needed for the adoption of such hybrid distributed power systems, including energy storage devices and environmental control technologies; and

(4) describe how activities under the strategy will be integrated with other research, development, demonstration, and commercial application activities supported by the Department of Energy related to electric power technologies.

**SEC. 113. HIGH POWER DENSITY INDUSTRY PROGRAM.**

The Secretary shall establish a comprehensive research, development, demonstration, and commercial application program to improve energy efficiency of high power density facilities, including data centers, server farms, and telecommunications facilities. Such program shall consider technologies that provide significant improvement in thermal controls, metering, load management, peak load reduction, or the efficient cooling of electronics.

**SEC. 114. MICRO-COGENERATION ENERGY TECHNOLOGY.**

The Secretary shall make competitive, merit-based grants to consortia for the development of micro-cogeneration energy technology. The consortia shall explore the use of small-scale combined heat and power in residential heating appliances.

## **PART 3—TRANSMISSION SYSTEMS**

**SEC. 115. TRANSMISSION INFRASTRUCTURE SYSTEMS RESEARCH, DEVELOPMENT, DEMONSTRATION, AND COMMERCIAL APPLICATION.**

(a) PROGRAM AUTHORIZED.—The Secretary shall develop and implement a comprehensive research, development, demonstration, and commercial application program to promote improved reliability and efficiency of electrical transmission systems. Such program may include——

(1) advanced energy technologies, materials, and systems;

(2) advanced grid reliability and efficiency technology development;

(3) technologies contributing to significant load reductions;

(4) advanced metering, load management, and control technologies;

(5) technologies to enhance existing grid components;

(6) the development and use of high-temperature superconductors to——

(A) enhance the reliability, operational flexibility, or power-carrying capability of electric transmission or distribution systems; or

(B) increase the efficiency of electric energy generation, transmission, distribution, or storage systems;

(7) integration of power systems, including systems to deliver high-quality electric power, electric power reliability, and combined heat and power;

(8) any other infrastructure technologies, as appropriate; and

(9) technology transfer and education.

(b) PROGRAM PLAN.—Not later than 1 year after the date of the enactment of this Act, the Secretary, in consultation with other appropriate Federal agencies, shall prepare and transmit to Congress a 5-year program plan to guide activities under this section. In preparing the program plan, the Secretary shall consult with utilities, energy services providers, manufacturers, institutions of higher education, other appropriate State and local agencies, environmental organizations, professional and technical societies, and any other persons the Secretary considers appropriate.

(c) REPORT.—Not later than 2 years after the transmittal of the plan under subsection (b), the Secretary shall transmit a report to Congress describing the progress made under this section and identifying any additional resources needed to continue the development and commercial application of transmission infrastructure technologies.

## Subtitle C—Renewable Energy

### PART 1—AUTHORIZATION OF APPROPRIATIONS

#### SEC. 121. RENEWABLE ENERGY.

(a) IN GENERAL.—The following sums are authorized to be appropriated to the Secretary for renewable energy research, development, demonstration, and commercial application activities, including activities authorized under this subtitle, including the amounts authorized under the amendments made by sections 124 and 125:

- (1) For fiscal year 2003, \$390,000,000.
- (2) For fiscal year 2004, \$460,000,000.
- (3) For fiscal year 2005, \$510,000,000.
- (4) For fiscal year 2006, \$560,000,000.
- (5) For fiscal year 2007, \$609,000,000.

(b) BIOENERGY.—From the amounts authorized under subsection (a), the following sums are authorized to be appropriated to carry out section 122 and section 176:

- (1) For fiscal year 2003, \$117,800,000.
- (2) For fiscal year 2004, \$135,425,000.
- (3) For fiscal year 2005, \$155,600,000.
- (4) For fiscal year 2006, \$167,650,000.
- (5) For fiscal year 2007, \$180,000,000.

#### (c) LIMITS ON USE OF FUNDS.—

(1) EXCLUSION.—None of the funds authorized to be appropriated under this section may be used for Renewable Support and Implementation.

(2) BIOENERGY.—Of the funds authorized under subsection (b), not less than \$5,000,000 for each fiscal year shall be made available for grants to Historically Black Colleges and Universities, Tribal Colleges, and Hispanic-Serving Institutions.

(3) RURAL AND REMOTE LOCATIONS.—In carrying out this section, the Secretary, in consultation with the Secretary of Agriculture, shall demonstrate the use of advanced wind power technology, biomass, geothermal energy systems, and other renewable energy technologies to assist in delivering electricity to rural and remote locations.

### PART 2—BIOENERGY

#### SEC. 122. BIOENERGY PROGRAMS.

The Secretary shall conduct a program of research, development, demonstration, and commercial application for bioenergy, including——

- (1) biopower energy systems;
- (2) biofuels;
- (3) integrated applications of both biopower and biofuels;
- (4) cross-cutting research and development in feedstocks; and
- (5) economic analysis.

### PART 3—HYDROGEN

#### SEC. 123. SHORT TITLE.

This part may be cited as the “George E. Brown, Jr. and Robert S. Walker Hydrogen Future Act of 2003”.

#### SEC. 124. MATSUNAGA ACT AMENDMENT.

The Spark M. Matsunaga Hydrogen Research, Development, and Demonstration Act of 1990 (42 U.S.C. 12401 et seq.) is amended by striking sections 102 through 109 and inserting the following:

#### “SEC. 102. FINDING, PURPOSES, AND DEFINITIONS.

“(a) FINDING.—Congress finds that it is in the national interest to accelerate efforts to develop a domestic capability to economically produce hydrogen in quantities that will make a significant contribution toward reducing the Nation’s dependence on conventional fuels.

“(b) PURPOSES.—The purposes of this Act are——

- “(1) to promote a research, development, and demonstration program leading to the economical and environmentally sound production, storage, transport,

and use of hydrogen as an energy source for industrial, commercial, residential, transportation, and utility applications; and

“(2) to promote and coordinate activities in technology transfer, education, and other information transfer among Federal, State, and local agencies; members of the energy, transportation, and other industries; foreign nations; and other entities.

“(c) DEFINITIONS.—As used in this Act, the term——

“(1) ‘advisory committee’ means the advisory committee established under section 108;

“(2) ‘critical technology’ (or ‘critical technical issue’) means a technology (or issue) that, in the opinion of the Secretary, requires understanding and development in order to take the next step needed in the development of hydrogen as an economic fuel or storage medium;

“(3) ‘Department’ means the Department of Energy; and

“(4) ‘Secretary’ means the Secretary of Energy.

**“SEC. 103. PLAN; REPORT.**

“(a) COORDINATION PLAN.—The Secretary, in consultation with other Federal agencies, shall prepare a comprehensive coordination plan for activities under this Act and under title II of the Hydrogen Future Act of 1996. The Secretary shall take into account any plan under section 202(b) of the Hydrogen Future Act of 1996.

“(b) REPORT.—

“(1) REQUIREMENT.—Not later than 1 year after the date of enactment of the George E. Brown, Jr. and Robert S. Walker Hydrogen Future Act of 2003, and biennially thereafter, the Secretary shall transmit to Congress a detailed report, based on the plan prepared under subsection (a), on the status and progress of the programs authorized under this Act.

“(2) CONTENTS.—A report under paragraph (1) shall include, in addition to any views and recommendations of the Secretary——

“(A) an assessment of the effectiveness of the programs authorized under this Act and of the extent to which they are meeting the purposes specified in section 102(b);

“(B) recommendations of the advisory committee for any improvements in the program that are needed, including recommendations for additional legislation; and

“(C) to the extent practicable, an analysis of Federal, State, local, and private sector hydrogen-related research, development, and demonstration activities to identify productive areas for increased intergovernmental and private-public sector collaboration.

**“SEC. 104. HYDROGEN RESEARCH AND DEVELOPMENT.**

“(a) PROGRAM.—The Secretary shall conduct a research and development program relating to the production, storage, transportation, and use of hydrogen as an energy source, with the goal of enabling the private sector to demonstrate the technical feasibility of using hydrogen for industrial, commercial, residential, transportation, and utility applications.

“(b) ELEMENTS.—In conducting the program authorized by this section, the Secretary shall——

“(1) initiate or accelerate research and development in critical technical issues that will contribute to the development of more economical and environmentally sound hydrogen energy systems, including critical technical issues with respect to——

“(A) production, with consideration of cost-effective production from renewable energy sources;

“(B) liquefaction, transmission, and distribution;

“(C) storage, including storage of hydrogen in surface transportation;

and

“(D) use, including use in——

“(i) surface transportation;

“(ii) isolated villages, islands, and communities in which other energy sources are not available or are very expensive;

“(iii) fuel cells and components, including proton exchange membrane technologies; and

“(iv) foreign markets, particularly where an energy infrastructure is not well developed;

“(2) give particular attention to resolving critical technical issues preventing the introduction of hydrogen as an energy source into the marketplace, so as to enable the development of voluntary consensus technical standards; and

“(3) survey private sector hydrogen energy research and development activities worldwide and take steps to ensure that research and development activities under this section do not——

“(A) unnecessarily duplicate any available research and development;

or

“(B) displace or compete with the privately funded hydrogen energy research and development activities of United States industry.

“(c) RESEARCH AND DEVELOPMENT SUPPORT.—The Secretary is authorized to arrange for tests and demonstrations and to disseminate to researchers and developers information, data, and other materials necessary to support the research and development activities authorized under this section and other efforts authorized under this Act, consistent with section 106.

“(d) FEDERAL FUNDING.—The Secretary shall carry out the research and development activities authorized under this section using a competitive merit review process.

“(e) COST SHARING.—

“(1) IN GENERAL.—The Secretary shall require a commitment from non-Federal sources of at least 20 percent of the cost of proposed research and development projects under this section.

“(2) REDUCTION OR ELIMINATION.—The Secretary may reduce or eliminate the cost sharing requirement under paragraph (1)——

“(A) if the Secretary determines that the research and development is of a basic or fundamental nature; or

“(B) for technical analyses, outreach activities, and educational programs that the Secretary does not expect to result in a marketable product.

**“SEC. 105. DEMONSTRATIONS.**

“(a) REQUIREMENT.—The Secretary shall conduct demonstrations of critical technologies so that technical and nontechnical parameters can be evaluated to best determine commercial applicability of such technologies. Demonstrations under this section shall include fuel cells and fuel cell components, including proton exchange membrane technologies, for commercial, residential, and transportation applications, using improved manufacturing production and processes.

“(b) DEMONSTRATIONS WITH RESEARCH AND DEVELOPMENT ACTIVITIES.—Concurrently with activities conducted pursuant to section 104, the Secretary shall conduct small-scale demonstrations of hydrogen energy technology at self-contained sites.

“(c) COST SHARING.—

“(1) IN GENERAL.—The Secretary shall require a commitment from non-Federal sources of at least 50 percent of the costs directly relating to a demonstration project under this section.

“(2) REDUCTION.—The Secretary may reduce the non-Federal requirement under paragraph (1) if the Secretary determines that the reduction is appropriate considering the technological risks involved in the project.

**“SEC. 106. TECHNOLOGY ASSESSMENT AND TRANSFER.**

“(a) PROGRAM.—

“(1) IN GENERAL.—The Secretary shall conduct a program designed to transfer critical technologies to the private sector, including application in foreign countries to increase the global market for the technologies and foster global development without harmful environmental effects.

“(2) ADVICE AND ASSISTANCE.—The Secretary shall direct the program authorized by this subsection with the advice and assistance of the advisory committee.

“(b) INFORMATION.—

“(1) IN GENERAL.—The Secretary, in carrying out the program authorized by subsection (a), shall——

“(A) undertake an update of the inventory and assessment of hydrogen energy technologies and their commercial capability to economically produce, store, transport, and use hydrogen as an energy source in the industrial, commercial, residential, transportation, and utility sectors; and

“(B) develop with the National Aeronautics and Space Administration, other Federal agencies as appropriate, and industry, an information exchange program to improve technology transfer for hydrogen energy technologies.

“(2) ACTIVITIES.—The information exchange program may consist of workshops, publications, conferences, and a database for the use by the public and private sectors. The Secretary shall also foster the exchange of generic, non-proprietary information and technology, developed pursuant to this Act, among

industry, academia, and the Federal Government, to help the United States economy attain the economic benefits of this information and technology.

**“SEC. 107. COORDINATION AND CONSULTATION.**

“(a) **SECRETARY’S RESPONSIBILITY.**—The Secretary shall have overall management responsibility for carrying out programs under this Act. In carrying out such programs, the Secretary, consistent with such overall management responsibility—

“(1) shall establish a central point for the coordination of all hydrogen energy research, development, and demonstration activities of the Department; and

“(2) may use the expertise of any other Federal agency in accordance with subsection (b) in carrying out any activities under this Act, to the extent that the Secretary determines that any such agency has capabilities which would allow such agency to contribute to the purposes of this Act.

“(b) **ASSISTANCE.**—The Secretary may, in accordance with subsection (a), obtain the assistance of any Federal agency upon written request, on a reimbursable basis or otherwise and with the consent of such agency. Each such request shall identify the assistance the Secretary considers necessary to carry out any duty under this Act.

“(c) **CONSULTATION.**—The Secretary shall consult with other Federal agencies as appropriate, and the advisory committee, in carrying out the Secretary’s authorities pursuant to this Act.

**“SEC. 108. ADVISORY COMMITTEE.**

“(a) **ESTABLISHMENT.**—There is hereby established the Hydrogen Technical Advisory Committee to advise the Secretary on the programs under this Act and under title II of the Hydrogen Future Act of 1996, to remain in existence for the duration of such programs.

“(b) **MEMBERSHIP.**—

“(1) **IN GENERAL.**—The advisory committee shall be comprised of not fewer than 9 nor more than 15 members appointed by the Secretary, and shall be comprised of such representatives from domestic industry, universities, professional societies, Government laboratories, and financial, environmental, and other organizations as the Secretary considers appropriate based on the Secretary’s assessment of the technical and other qualifications of such representatives.

“(2) **TERMS.**—

“(A) **IN GENERAL.**—The term of a member of the advisory committee shall not be more than three years.

“(B) **STAGGERED TERMS.**—The Secretary may appoint members of the advisory committee in a manner that allows the terms of the members serving at any time to expire at spaced intervals so as to ensure continuity in the functioning of the advisory committee.

“(C) **REAPPOINTMENT.**—A member of the advisory committee whose term expires may be reappointed.

“(3) **CHAIRPERSON.**—The advisory committee shall have a chairperson, who shall be elected by the members from among their number.

“(c) **COOPERATION.**—The heads of Federal agencies shall cooperate with the advisory committee in carrying out the requirements of this section and shall furnish to the advisory committee such information as the advisory committee considers necessary to carry out this section.

“(d) **REVIEW.**—The advisory committee shall review and make any necessary recommendations to the Secretary on—

“(1) the implementation and conduct of programs under this Act;

“(2) the economic, technological, and environmental consequences of the deployment of technologies for the production, storage, transportation, and use of hydrogen as an energy source; and

“(3) the coordination plan prepared by the Secretary under section 103 and the plan developed by the interagency task force under section 202(b) of the Hydrogen Future Act of 1996.

“(e) **RESPONSE TO RECOMMENDATIONS.**—The Secretary shall consider, but need not adopt, any recommendations of the advisory committee under subsection (d). The Secretary shall either describe the implementation, or provide an explanation of the reasons that any such recommendations will not be implemented, in the report to Congress under section 103(b).

“(f) **SUPPORT.**—The Secretary shall provide such staff, funds, and other support as may be necessary to enable the advisory committee to carry out its functions.

**“SEC. 109. NATIONAL ACADEMY OF SCIENCES REVIEW.**

“Beginning 2 years after the date of the enactment of this section, and every 4 years thereafter, the National Academy of Sciences shall perform a review of the progress made through the programs and activities authorized under this Act and title II of the Hydrogen Future Act of 1996, and shall report to the Congress on the results of such reviews.

**“SEC. 110. AUTHORIZATION OF APPROPRIATIONS.**

“There are authorized to be appropriated to carry out the purposes of this Act (in addition to any amounts made available for such purposes under other Acts)——

- “(1) \$3,000,000 for fiscal year 1992;
- “(2) \$7,000,000 for fiscal year 1993;
- “(3) \$10,000,000 for fiscal year 1994;
- “(4) \$14,500,000 for fiscal year 1996;
- “(5) \$20,000,000 for fiscal year 1997;
- “(6) \$25,000,000 for fiscal year 1998;
- “(7) \$30,000,000 for fiscal year 1999;
- “(8) \$35,000,000 for fiscal year 2000;
- “(9) \$40,000,000 for fiscal year 2001;
- “(10) \$45,000,000 for fiscal year 2002;
- “(11) \$50,000,000 for fiscal year 2003;
- “(12) \$55,000,000 for fiscal year 2004;
- “(13) \$60,000,000 for fiscal year 2005;
- “(14) \$65,000,000 for fiscal year 2006; and
- “(15) \$70,000,000 for fiscal year 2007.”.

**SEC. 125. HYDROGEN FUTURE ACT AMENDMENT.**

Title II of the Hydrogen Future Act of 1996 (42 U.S.C. 12403 note) is amended to read as follows:

**“TITLE II—FUEL CELLS****“SEC. 201. INTEGRATION OF FUEL CELLS WITH HYDROGEN SYSTEMS.**

“(a) IN GENERAL.—The Secretary shall solicit proposals for projects demonstrating hydrogen technologies needed to use fuel cells in Federal, State, and local government stationary and transportation applications.

“(b) COMPETITIVE EVALUATION.—Each proposal submitted in response to the solicitation under this section shall be evaluated on a competitive basis using peer review. The Secretary is not required to make an award under this section in the absence of a meritorious proposal.

“(c) PREFERENCE.—The Secretary shall give preference, in making an award under this section, to proposals that——

“(1) are submitted jointly from consortia including academic institutions, industry, State or local governments, and Federal laboratories; and

“(2) reflect proven experience and capability with technologies relevant to the projects proposed.

“(d) NON-FEDERAL SHARE.——

“(1) IN GENERAL.—Except as provided in paragraph (2), the Secretary shall require a commitment from non-Federal sources of at least 50 percent of the costs directly relating to a demonstration project under this section.

“(2) REDUCTION.—The Secretary may reduce the non-Federal requirement under paragraph (1) if the Secretary determines that the reduction is appropriate considering the technological risks involved in the project.

**“SEC. 202. INTERAGENCY TASK FORCE.**

“(a) ESTABLISHMENT.—Not later than 120 days after the date of enactment of the George E. Brown, Jr. and Robert S. Walker Hydrogen Future Act of 2003, the Secretary shall establish an interagency task force led by the Secretary’s designee and comprised of representatives of——

“(1) the Office of Science and Technology Policy;

“(2) the Department of Transportation;

“(3) the Department of Defense;

“(4) the Department of Commerce (including the National Institute of Standards and Technology);

“(5) the Environmental Protection Agency;

“(6) the National Aeronautics and Space Administration; and

“(7) other Federal agencies as appropriate.

“(b) DUTIES.—

“(1) DEVELOPMENT OF PLAN.—The task force shall develop a plan for carrying out this title.

“(2) FOCUS OF PLAN.—The plan shall focus on development and demonstration of integrated systems and components for—

“(A) the production, storage, transport, and use of hydrogen as an energy source for Federal, State, and local government stationary and transportation applications;

“(B) hydrogen-based infrastructure for buses and other fleet transportation systems that include zero-emission vehicles; and

“(C) hydrogen-based distributed power generation, including the generation of combined heat, power, and hydrogen.

**“SEC. 203. COOPERATIVE AND COST-SHARING AGREEMENTS.**

“The Secretary shall enter into cooperative and cost-sharing agreements with Federal, State, and local agencies for participation by the agencies in demonstrations at facilities administered by the agencies, with the aim of integrating high-efficiency hydrogen systems using fuel cells into the facilities to provide near-term benefits and promote a smooth transition to hydrogen as an energy source.

**“SEC. 204. INTEGRATION AND DISSEMINATION OF TECHNICAL INFORMATION.**

“The Secretary shall—

“(1) integrate all the technical information available as a result of development and demonstration projects under this title;

“(2) make the information available to all interested persons; and

“(3) foster the exchange of generic, nonproprietary information and technology developed under this title among industry, academia, and Federal, State, and local governments, to help the United States economy attain the economic benefits of the information and technology.

**“SEC. 205. AUTHORIZATION OF APPROPRIATIONS.**

“There are authorized to be appropriated to the Secretary, for activities under this title—

“(1) \$5,000,000 for fiscal year 2003;

“(2) \$25,000,000 for fiscal year 2004;

“(3) \$30,000,000 for fiscal year 2005;

“(4) \$35,000,000 for fiscal year 2006; and

“(5) \$40,000,000 for fiscal year 2007.”.

## **PART 4—MISCELLANEOUS PROJECTS**

**SEC. 126. MISCELLANEOUS PROJECTS.**

The Secretary shall conduct research, development, demonstration, and commercial application programs for—

(1) ocean energy, including wave energy;

(2) the combined use of renewable energy technologies with one another and with other energy technologies, including the combined use of wind power and coal gasification technologies; and

(3) hydrogen carrier fuels.

## **Subtitle D—Nuclear Energy**

### **PART 1—AUTHORIZATION OF APPROPRIATIONS**

**SEC. 131. NUCLEAR ENERGY.**

(a) CORE PROGRAMS.—The following sums are authorized to be appropriated to the Secretary for nuclear energy research, development, demonstration, and commercial application activities, including activities authorized under this subtitle, other than those described in subsection (b):

(1) For fiscal year 2003, \$200,000,000.

(2) For fiscal year 2004, \$233,000,000.

(3) For fiscal year 2005, \$266,000,000.

(4) For fiscal year 2006, \$300,000,000.

(5) For fiscal year 2007, \$334,000,000.

(b) NUCLEAR INFRASTRUCTURE SUPPORT.—The following sums are authorized to be appropriated to the Secretary for activities under section 132(f):

- (1) For fiscal year 2003, \$120,000,000.
- (2) For fiscal year 2004, \$125,000,000.
- (3) For fiscal year 2005, \$130,000,000.
- (4) For fiscal year 2006, \$135,000,000.
- (5) For fiscal year 2007, \$140,000,000.

(c) ALLOCATIONS.—From amounts authorized under subsection (a), the following sums are authorized:

(1) ADVANCED FUEL RECYCLING PROGRAM.—For activities under section 133—

- (A) for fiscal year 2003, \$80,000,000;
- (B) for fiscal year 2004, \$93,000,000;
- (C) for fiscal year 2005, \$106,000,000;
- (D) for fiscal year 2006, \$120,000,000; and
- (E) for fiscal year 2007, \$134,000,000.

(2) UNIVERSITY PROGRAMS.—For activities under section 134—

- (A) for fiscal year 2003, \$25,000,000;
- (B) for fiscal year 2004, \$33,000,000;
- (C) for fiscal year 2005, \$37,900,000;
- (D) for fiscal year 2006, \$43,600,000; and
- (E) for fiscal year 2007, \$50,100,000.

(d) LIMIT ON USE OF FUNDS.—None of the funds authorized under this section may be used for decommissioning the Fast Flux Test Facility.

## PART 2—NUCLEAR ENERGY RESEARCH PROGRAMS

### SEC. 132. NUCLEAR ENERGY RESEARCH PROGRAMS.

(a) NUCLEAR ENERGY RESEARCH INITIATIVE.—The Secretary shall carry out a Nuclear Energy Research Initiative for research and development related to nuclear energy.

(b) NUCLEAR ENERGY PLANT OPTIMIZATION PROGRAM.—The Secretary shall carry out a Nuclear Energy Plant Optimization Program to support research and development activities addressing reliability, availability, productivity, and component aging in existing nuclear power plants.

(c) NUCLEAR POWER 2010 PROGRAM.—The Secretary shall carry out a Nuclear Power 2010 Program, consistent with recommendations in the October 2001 report entitled “A Roadmap to Deploy New Nuclear Power Plants in the United States by 2010” issued by the Nuclear Energy Research Advisory Committee of the Department. The Program shall—

- (1) rely on the expertise and capabilities of the National Laboratories in the areas of advanced nuclear fuels cycles and fuels testing;
- (2) pursue an approach that considers a variety of reactor designs;
- (3) include participation of international collaborators in research, development, and design efforts as appropriate; and
- (4) encourage industry participation.

(d) GENERATION IV NUCLEAR ENERGY SYSTEMS INITIATIVE.—The Secretary shall carry out a Generation IV Nuclear Energy Systems Initiative to develop an overall technology plan and to support research and development necessary to make an informed technical decision about the most promising candidates for eventual commercial application. The Initiative shall examine advanced proliferation-resistant and passively safe reactor designs, including designs that—

- (1) are economically competitive with other electric power generation plants;
- (2) have higher efficiency, lower cost, and improved safety compared to reactors in operation on the date of enactment of this Act;
- (3) use fuels that are proliferation resistant and have substantially reduced production of high-level waste per unit of output; and
- (4) utilize improved instrumentation.

(e) REACTOR PRODUCTION OF HYDROGEN.—The Secretary shall carry out research to examine designs for high-temperature reactors capable of producing large-scale quantities of hydrogen using thermochemical processes.

(f) NUCLEAR INFRASTRUCTURE SUPPORT.—The Secretary shall develop and implement a strategy for the facilities of the Office of Nuclear Energy, Science, and Technology and shall transmit a report containing the strategy along with the President’s budget request to the Congress for fiscal year 2005. Such strategy shall provide a cost-effective means for—

- (1) maintaining existing facilities and infrastructure, as needed;
- (2) closing unneeded facilities;
- (3) making facility upgrades and modifications; and
- (4) building new facilities.

### **PART 3—ADVANCED FUEL RECYCLING**

#### **SEC. 133. ADVANCED FUEL RECYCLING PROGRAM.**

(a) **IN GENERAL.**—The Secretary, through the Director of the Office of Nuclear Energy, Science and Technology, shall conduct an advanced fuel recycling technology research and development program to evaluate proliferation-resistant fuel recycling and transmutation technologies which minimize environmental or public health and safety impacts as an alternative to aqueous reprocessing technologies deployed as of the date of enactment of this Act in support of evaluation of alternative national strategies for spent nuclear fuel and the Generation IV advanced reactor concepts, subject to annual review by the Secretary's Nuclear Energy Research Advisory Committee or other independent entity, as appropriate. Opportunities to enhance progress of this program through international cooperation should be sought.

(b) **REPORTS.**—The Secretary shall report on the activities of the advanced fuel recycling technology research and development program, as part of the Department's annual budget submission.

### **PART 4—UNIVERSITY PROGRAMS**

#### **SEC. 134. UNIVERSITY NUCLEAR SCIENCE AND ENGINEERING SUPPORT.**

(a) **ESTABLISHMENT.**—The Secretary shall support a program to invest in human resources and infrastructure in the nuclear sciences and engineering and related fields (including health physics and nuclear and radiochemistry), consistent with departmental missions related to civilian nuclear research and development.

(b) **DUTIES.**—In carrying out the program under this section, the Secretary shall—

- (1) establish a graduate and undergraduate fellowship program to attract new and talented students;
- (2) establish a Junior Faculty Research Initiation Grant Program to assist institutions of higher education in recruiting and retaining new faculty in the nuclear sciences and engineering;
- (3) support fundamental nuclear sciences and engineering research through the Nuclear Engineering Education Research Program;
- (4) encourage collaborative nuclear research among industry, National Laboratories, and institutions of higher education through the Nuclear Energy Research Initiative; and
- (5) support communication and outreach related to nuclear science and engineering.

(c) **MAINTAINING UNIVERSITY RESEARCH AND TRAINING REACTORS AND ASSOCIATED INFRASTRUCTURE.**—Activities under this section may include—

- (1) converting research reactors currently using high-enrichment fuels to low-enrichment fuels, upgrading operational instrumentation, and sharing of reactors among institutions of higher education;
- (2) providing technical assistance, in collaboration with the United States nuclear industry, in relicensing and upgrading training reactors as part of a student training program; and
- (3) providing funding for reactor improvements as part of a focused effort that emphasizes research, training, and education.

(d) **UNIVERSITY-NATIONAL LABORATORY INTERACTIONS.**—The Secretary shall develop—

- (1) a sabbatical fellowship program for professors at institutions of higher education to spend extended periods of time at National Laboratories in the areas of nuclear science and technology; and
- (2) a visiting scientist program in which National Laboratory staff can spend time in academic nuclear science and engineering departments.

The Secretary may provide fellowships for students to spend time at National Laboratories in the area of nuclear science with a member of the Laboratory staff acting as a mentor.

(e) **OPERATING AND MAINTENANCE COSTS.**—Funding for a research project provided under this section may be used to offset a portion of the operating and main-

tenance costs of a research reactor at an institution of higher education used in the research project.

## Subtitle E—Fossil Energy

### PART 1—AUTHORIZATION OF APPROPRIATIONS

#### SEC. 141. FOSSIL ENERGY.

(a) IN GENERAL.—The following sums are authorized to be appropriated to the Secretary for fossil energy research, development, demonstration, and commercial application activities, including activities authorized under this subtitle, other than those described in subsection (b):

- (1) For fiscal year 2003, \$505,000,000.
- (2) For fiscal year 2004, \$523,000,000.
- (3) For fiscal year 2005, \$542,000,000.
- (4) For fiscal year 2006, \$558,000,000.
- (5) For fiscal year 2007, \$585,000,000.

(b) ULTRA-DEEPWATER AND UNCONVENTIONAL RESOURCES.—

(1) OIL AND GAS LEASE INCOME.—For each of fiscal years 2003 through 2010, from any royalties, rents, and bonuses derived from Federal onshore and offshore oil and gas leases issued under the Outer Continental Shelf Lands Act and the Mineral Leasing Act which are deposited in the Treasury, and after distribution of any such funds as described in paragraph (2), an amount equal to 7.5 percent of the amount of royalties, rents, and bonuses derived from those leases deposited in the Treasury shall be deposited into the Ultra-Deepwater and Unconventional Natural Gas and Other Petroleum Research Fund (in this subsection referred to as the Fund). For purposes of this subsection, the term “royalties” excludes proceeds from the sale of royalty production taken in kind and royalty production that is transferred under section 27(a)(3) of the Outer Continental Shelf Lands Act (43 U.S.C. 1353(a)(3)). Monies in the Fund shall be available to the Secretary for obligation under part 3, without fiscal year limitation, to the extent provided in advance in appropriations Acts.

(2) PRIOR DISTRIBUTIONS.—The distributions described in paragraph (1) are those required by law—

(A) to States and to the Reclamation Fund under the Mineral Leasing Act (30 U.S.C. 191(a)); and

(B) to other funds receiving monies from Federal oil and gas leasing programs, including—

(i) any recipients pursuant to section 8(g) of the Outer Continental Shelf Lands Act (43 U.S.C. 1337(g));

(ii) the Land and Water Conservation Fund, pursuant to section 2(c) of the Land and Water Conservation Fund Act of 1965 (16 U.S.C. 4601–5(c)); and

(iii) the Historic Preservation Fund, pursuant to section 108 of the National Historic Preservation Act (16 U.S.C. 470h).

(3) ALLOCATION.—Amounts made available under this subsection in each fiscal year shall be allocated as follows:

(A) 67.5 percent shall be for ultra-deepwater natural gas and other petroleum activities under section 145;

(B) 22.5 percent shall be for unconventional natural gas and other petroleum resource activities under section 146; and

(C) 10 percent shall be for research complementary to research under section 144(b)(1) through (3).

(c) ALLOCATIONS.—From amounts authorized under subsection (a), the following sums are authorized:

(1) FUEL CELL PROTON EXCHANGE MEMBRANE TECHNOLOGY.—For activities under section 142(c)(2), \$28,000,000 for each of the fiscal years 2003 through 2007.

(2) COAL MINING TECHNOLOGIES.—For activities under section 143—

(A) for fiscal year 2004, \$12,000,000; and

(B) for fiscal year 2005, \$15,000,000.

(3) OFFICE OF ARCTIC ENERGY.—For the Office of Arctic Energy under section 3197 of the Floyd D. Spence National Defense Authorization Act for Fiscal Year 2001 (Public Law 106–398), \$25,000,000 for each of fiscal years 2003 through 2007.

(d) EXTENDED AUTHORIZATION.—There are authorized to be appropriated to the Secretary for the Office of Arctic Energy under section 3197 of the Floyd D. Spence National Defense Authorization Act for Fiscal Year 2001 (Public Law 106–398), \$25,000,000 for each of fiscal years 2008 through 2011.

(e) LIMITS ON USE OF FUNDS.—

(1) EXCLUSIONS.—None of the funds authorized under this section may be used for—

- (A) Fossil Energy Environmental Restoration; or
- (B) Import/Export Authorization.

(2) UNIVERSITY COAL MINING RESEARCH.—Of the funds authorized under subsection (c)(2), not less than 20 percent of the funds appropriated for each fiscal year shall be dedicated to research and development carried out at institutions of higher education.

## PART 2—RESEARCH PROGRAMS

### SEC. 142. FOSSIL ENERGY RESEARCH PROGRAMS.

(a) COAL RESEARCH.—(1) In addition to the Clean Coal Power Initiative authorized under title V, the Secretary shall conduct a program of research, development, demonstration, and commercial application for coal and power systems, including—

- (A) central systems;
- (B) sequestration research and development;
- (C) fuels;
- (D) advanced research; and
- (E) advanced separation technologies.

(2) No funds may be used to carry out the activities authorized by paragraph (1) after September 30, 2003, unless one month has elapsed since the Secretary has transmitted to the Congress a report providing—

- (A) a detailed description of how proposals will be solicited and evaluated;
- (B) a list of activities and technical milestones; and
- (C) a description of how these activities will complement and not duplicate the Clean Coal Power Initiative authorized under title V.

(b) OIL AND GAS RESEARCH.—The Secretary shall conduct a program of research, development, demonstration, and commercial application on oil and gas, including—

- (1) exploration and production;
- (2) gas hydrates;
- (3) reservoir life and extension;
- (4) transportation and distribution infrastructure;
- (5) ultraclean fuels;
- (6) heavy oil and oil shale; and
- (7) environmental research.

(c) FUEL CELLS.—(1) The Secretary shall conduct a program of research, development, demonstration, and commercial application on fuel cells for low-cost, high-efficiency, fuel-flexible, modular power systems.

(2) The demonstrations shall include fuel cell proton exchange membrane technology for commercial, residential, and transportation applications, and distributed generation systems, utilizing improved manufacturing production and processes.

(d) NATURAL GAS AND OIL DEPOSITS REPORT.—Not later than 2 years after the date of the enactment of this Act, and at 2-year intervals thereafter, the Secretary of the Interior, in consultation with other appropriate Federal agencies, shall transmit a report to the Congress of the latest estimates of natural gas and oil reserves, reserves growth, and undiscovered resources in Federal and State waters off the coast of Louisiana and Texas.

### SEC. 143. RESEARCH AND DEVELOPMENT FOR COAL MINING TECHNOLOGIES.

(a) ESTABLISHMENT.—The Secretary shall carry out a program of research and development on coal mining technologies. The Secretary shall cooperate with appropriate Federal agencies, coal producers, trade associations, equipment manufacturers, institutions of higher education with mining engineering departments, and other relevant entities.

(b) PROGRAM.—The research and development activities carried out under this section shall—

- (1) be based on the mining research and development priorities identified by the Mining Industry of the Future Program and in the recommendations

from relevant reports of the National Academy of Sciences on mining technologies; and

(2) expand mining research capabilities at institutions of higher education.

### **PART 3—ULTRA-DEEPWATER AND UNCONVENTIONAL NATURAL GAS AND OTHER PETROLEUM RESOURCES**

#### **SEC. 144. PROGRAM AUTHORITY.**

(a) **IN GENERAL.**—The Secretary shall carry out a program under this part of research, development, demonstration, and commercial application of technologies for ultra-deepwater and unconventional natural gas and other petroleum resource exploration and production, including safe operations and environmental mitigation (including reduction of greenhouse gas emissions and sequestration of carbon).

(b) **PROGRAM ELEMENTS.**—The program under this part shall address the following areas, including improving safety and minimizing environmental impacts of activities within each area:

(1) Ultra-deepwater technology.

(2) Ultra-deepwater architecture.

(3) Unconventional natural gas and other petroleum resource exploration and production technology.

(c) **LIMITATION ON LOCATION OF FIELD ACTIVITIES.**—Field activities under the program under this part shall be carried out only——

(1) in——

(A) areas in the territorial waters of the United States not under any Outer Continental Shelf moratorium as of September 30, 2002;

(B) areas onshore in the United States on public land administered by the Secretary of the Interior available for oil and gas leasing, where consistent with applicable law and land use plans; and

(C) areas onshore in the United States on State or private land, subject to applicable law; and

(2) with the approval of the appropriate Federal or State land management agency or private land owner.

(d) **RESEARCH AT NATIONAL ENERGY TECHNOLOGY LABORATORY.**—The Secretary, through the National Energy Technology Laboratory, shall carry out research complementary to research under section 144(b)(1) through (3).

(e) **CONSULTATION WITH SECRETARY OF THE INTERIOR.**—In carrying out this part, the Secretary shall consult regularly with the Secretary of the Interior.

#### **SEC. 145. ULTRA-DEEPWATER PROGRAM.**

(a) **IN GENERAL.**—The Secretary shall carry out the activities under paragraphs (1) and (2) of section 144(b), to maximize the value of the ultra-deepwater natural gas and other petroleum resources of the United States by increasing the supply of such resources and by reducing the cost and increasing the efficiency of exploration for and production of such resources, while improving safety and minimizing environmental impacts.

(b) **ROLE OF THE SECRETARY.**—The Secretary shall have ultimate responsibility for, and oversight of, all aspects of the program under this section.

(c) **ROLE OF THE PROGRAM CONSORTIUM.**——

(1) **IN GENERAL.**—The Secretary shall contract with a consortium to——

(A) manage awards pursuant to subsection (f)(4);

(B) make recommendations to the Secretary for project solicitations;

(C) disburse funds awarded under subsection (f) as directed by the Secretary in accordance with the annual plan under subsection (e); and

(D) carry out other activities assigned to the program consortium by this section.

(2) **LIMITATION.**—The Secretary may not assign any activities to the program consortium except as specifically authorized under this section.

(3) **CONFLICT OF INTEREST.**—(A) The Secretary shall establish procedures——

(i) to ensure that each board member, officer, or employee of the program consortium who is in a decisionmaking capacity under subsection (f)(3) or (4) shall disclose to the Secretary any financial interests in, or financial relationships with, applicants for or recipients of awards under this section, including those of his or her spouse or minor child, unless such relationships or interests would be considered to be remote or inconsequential; and

(ii) to require any board member, officer, or employee with a financial relationship or interest disclosed under clause (i) to recuse himself or herself from any review under subsection (f)(3) or oversight under subsection (f)(4) with respect to such applicant or recipient.

(B) The Secretary may disqualify an application or revoke an award under this section if a board member, officer, or employee has failed to comply with procedures required under subparagraph (A)(ii).

(d) SELECTION OF THE PROGRAM CONSORTIUM.—

(1) IN GENERAL.—The Secretary shall select the program consortium through an open, competitive process.

(2) MEMBERS.—The program consortium may include corporations, institutions of higher education, National Laboratories, or other research institutions. After submitting a proposal under paragraph (4), the program consortium may not add members without the consent of the Secretary.

(3) TAX STATUS.—The program consortium shall be an entity that is exempt from tax under section 501(c)(3) of the Internal Revenue Code of 1986.

(4) SCHEDULE.—Not later than 90 days after the date of enactment of this Act, the Secretary shall solicit proposals for the creation of the program consortium, which must be submitted not less than 180 days after the date of enactment of this Act. The Secretary shall select the program consortium not later than 240 days after such date of enactment.

(5) APPLICATION.—Applicants shall submit a proposal including such information as the Secretary may require. At a minimum, each proposal shall—

(A) list all members of the consortium;

(B) fully describe the structure of the consortium, including any provisions relating to intellectual property; and

(C) describe how the applicant would carry out the activities of the program consortium under this section.

(6) ELIGIBILITY.—To be eligible to be selected as the program consortium, an applicant must be an entity whose members collectively have demonstrated capabilities in planning and managing research, development, demonstration, and commercial application programs in natural gas or other petroleum exploration or production.

(7) CRITERION.—The Secretary may consider the amount of the fee an applicant proposes to receive under subsection (g) in selecting a consortium under this section.

(e) ANNUAL PLAN.—

(1) IN GENERAL.—The program under this section shall be carried out pursuant to an annual plan prepared by the Secretary in accordance with paragraph (2).

(2) DEVELOPMENT.—(A) Before drafting an annual plan under this subsection, the Secretary shall solicit specific written recommendations from the program consortium for each element to be addressed in the plan, including those described in paragraph (4). The Secretary may request that the program consortium submit its recommendations in the form of a draft annual plan.

(B) The Secretary shall submit the recommendations of the program consortium under subparagraph (A) to the Ultra-Deepwater Advisory Committee established under section 148(a) for review, and such Advisory Committee shall provide to the Secretary written comments by a date determined by the Secretary. The Secretary may also solicit comments from any other experts.

(C) The Secretary shall consult regularly with the program consortium throughout the preparation of the annual plan.

(3) PUBLICATION.—The Secretary shall transmit to the Congress and publish in the Federal Register the annual plan, along with any written comments received under paragraph (2)(A) and (B). The annual plan shall be transmitted and published not later than 60 days after the date of enactment of an Act making appropriations for a fiscal year for the program under this section.

(4) CONTENTS.—The annual plan shall describe the ongoing and prospective activities of the program under this section and shall include—

(A) a list of any solicitations for awards that the Secretary plans to issue to carry out research, development, demonstration, or commercial application activities, including the topics for such work, who would be eligible to apply, selection criteria, and the duration of awards; and

(B) a description of the activities expected of the program consortium to carry out subsection (f)(4).

(f) AWARDS.—

(1) IN GENERAL.—The Secretary shall make awards to carry out research, development, demonstration, and commercial application activities under the

program under this section. The program consortium shall not be eligible to receive such awards, but members of the program consortium may receive such awards.

(2) PROPOSALS.—The Secretary shall solicit proposals for awards under this subsection in such manner and at such time as the Secretary may prescribe, in consultation with the program consortium.

(3) REVIEW.—The Secretary shall make awards under this subsection through a competitive process, which shall include a review by individuals selected by the Secretary. Such individuals shall include, for each application, Federal officials, the program consortium, and non-Federal experts who are not board members, officers, or employees of the program consortium or of a member of the program consortium.

(4) OVERSIGHT.—(A) The program consortium shall oversee the implementation of awards under this subsection, consistent with the annual plan under subsection (e), including disbursing funds and monitoring activities carried out under such awards for compliance with the terms and conditions of the awards.

(B) Nothing in subparagraph (A) shall limit the authority or responsibility of the Secretary to oversee awards, or limit the authority of the Secretary to review or revoke awards.

(C) The Secretary shall provide to the program consortium the information necessary for the program consortium to carry out its responsibilities under this paragraph.

(g) FEE.—

(1) IN GENERAL.—To compensate the program consortium for carrying out its activities under this section, the Secretary shall provide to the program consortium a fee in an amount not to exceed 7.5 percent of the amounts awarded under subsection (f) for each fiscal year.

(2) ADVANCE.—The Secretary shall advance funds to the program consortium upon selection of the consortium, which shall be deducted from amounts to be provided under paragraph (1).

(h) AUDIT.—The Secretary shall retain an independent, commercial auditor to determine the extent to which funds provided to the program consortium, and funds provided under awards made under subsection (f), have been expended in a manner consistent with the purposes and requirements of this part. The auditor shall transmit a report annually to the Secretary, who shall transmit the report to Congress, along with a plan to remedy any deficiencies cited in the report.

**SEC. 146. UNCONVENTIONAL NATURAL GAS AND OTHER PETROLEUM RESOURCES PROGRAM.**

(a) IN GENERAL.—The Secretary shall carry out activities under section 144(b)(3), to maximize the value of the onshore unconventional natural gas and other petroleum resources of the United States by increasing the supply of such resources and by reducing the cost and increasing the efficiency of exploration for and production of such resources, while improving safety and minimizing environmental impacts.

(b) AWARDS.—

(1) IN GENERAL.—The Secretary shall carry out this section through awards made through an open, competitive process.

(2) CONSORTIA.—In carrying out paragraph (1), the Secretary shall give preference to making awards to consortia.

(c) AUDIT.—The Secretary shall retain an independent, commercial auditor to determine the extent to which funds provided under awards made under this section have been expended in a manner consistent with the purposes and requirements of this part. The auditor shall transmit a report annually to the Secretary, who shall transmit the report to Congress, along with a plan to remedy any deficiencies cited in the report.

(d) FOCUS AREAS.—Awards under this section may focus on areas including advanced coal-bed methane, deep drilling, natural gas production from tight sands, natural gas production from gas shales, innovative exploration and production techniques, enhanced recovery techniques, and environmental mitigation of unconventional natural gas and other petroleum resources exploration and production.

(e) ACTIVITIES BY THE UNITED STATES GEOLOGICAL SURVEY.—The Secretary of the Interior, through the United States Geological Survey, shall, where appropriate, carry out programs of long-term research to complement the programs under this section.

**SEC. 147. ADDITIONAL REQUIREMENTS FOR AWARDS.**

(a) DEMONSTRATION PROJECTS.—An application for an award under this part for a demonstration project shall describe with specificity the intended commercial use of the technology to be demonstrated.

(b) **FLEXIBILITY IN LOCATING DEMONSTRATION PROJECTS.**—Subject to the limitation in section 144(c), a demonstration project under this part relating to an ultra-deepwater technology or an ultra-deepwater architecture may be conducted in deep-water depths.

(c) **INTELLECTUAL PROPERTY AGREEMENTS.**—If an award under this part is made to a consortium (other than the program consortium), the consortium shall provide to the Secretary a signed contract agreed to by all members of the consortium describing the rights of each member to intellectual property used or developed under the award.

(d) **TECHNOLOGY TRANSFER.**—Each recipient of an award under this part shall conduct technology transfer activities, as appropriate, and outreach activities pursuant to section 190.

(e) **COST-SHARING REDUCTION FOR INDEPENDENT PRODUCERS.**—In applying the cost-sharing requirements under section 182 to an award under this part made solely to an independent producer of oil or gas, the Secretary may reduce the applicable non-Federal requirement in such section to a level not less than 10 percent of the cost of the project.

**SEC. 148. ADVISORY COMMITTEES.**

(a) **ULTRA-DEEPWATER ADVISORY COMMITTEE.**—

(1) **ESTABLISHMENT.**—Not later than 270 days after the date of enactment of this section, the Secretary shall establish an advisory committee to be known as the Ultra-Deepwater Advisory Committee.

(2) **MEMBERSHIP.**—The advisory committee under this subsection shall be composed of members appointed by the Secretary and including—

(A) individuals with extensive research experience or operational knowledge of offshore natural gas and other petroleum exploration and production;

(B) individuals broadly representative of the affected interests in ultra-deepwater natural gas and other petroleum production, including interests in environmental protection and safe operations;

(C) no individuals who are Federal employees; and

(D) no individuals who are board members, officers, or employees of the program consortium.

(3) **DUTIES.**—The advisory committee under this subsection shall—

(A) advise the Secretary on the development and implementation of programs under this part related to ultra-deepwater natural gas and other petroleum resources; and

(B) carry out section 145(e)(2)(B).

(4) **COMPENSATION.**—A member of the advisory committee under this subsection shall serve without compensation but shall receive travel expenses, including per diem in lieu of subsistence, in accordance with applicable provisions under subchapter I of chapter 57 of title 5, United States Code.

(b) **UNCONVENTIONAL RESOURCES TECHNOLOGY ADVISORY COMMITTEE.**—

(1) **ESTABLISHMENT.**—Not later than 270 days after the date of enactment of this section, the Secretary shall establish an advisory committee to be known as the Unconventional Resources Technology Advisory Committee.

(2) **MEMBERSHIP.**—The advisory committee under this subsection shall be composed of members appointed by the Secretary and including—

(A) individuals with extensive research experience or operational knowledge of unconventional natural gas and other petroleum resource exploration and production, including independent oil and gas producers;

(B) individuals broadly representative of the affected interests in unconventional natural gas and other petroleum resource exploration and production, including interests in environmental protection and safe operations; and

(C) no individuals who are Federal employees.

(3) **DUTIES.**—The advisory committee under this subsection shall advise the Secretary on the development and implementation of activities under this part related to unconventional natural gas and other petroleum resources.

(4) **COMPENSATION.**—A member of the advisory committee under this subsection shall serve without compensation but shall receive travel expenses, including per diem in lieu of subsistence, in accordance with applicable provisions under subchapter I of chapter 57 of title 5, United States Code.

(c) **PROHIBITION.**—No advisory committee established under this section shall make recommendations on funding awards to consortia or for specific projects.

**SEC. 149. LIMITS ON PARTICIPATION.**

(a) **IN GENERAL.**—An entity shall be eligible to receive an award under this part only if the Secretary finds—

(1) that the entity's participation in the program under this part would be in the economic interest of the United States; and

(2) that either—

(A) the entity is a United States-owned entity organized under the laws of the United States; or

(B) the entity is organized under the laws of the United States and has a parent entity organized under the laws of a country which affords—

(i) to United States-owned entities opportunities, comparable to those afforded to any other entity, to participate in any cooperative research venture similar to those authorized under this part;

(ii) to United States-owned entities local investment opportunities comparable to those afforded to any other entity; and

(iii) adequate and effective protection for the intellectual property rights of United States-owned entities.

(b) **SENSE OF CONGRESS AND REPORT.**—It is the Sense of the Congress that ultra-deepwater technology developed under this part is to be developed primarily for production of ultra-deepwater natural gas and other petroleum resources of the United States, and that this priority is to be reflected in the terms of grants, contracts, and cooperative agreements entered under this part. As part of the annual Departmental budget submission, the Secretary shall report on all steps taken to implement the policy described in this subsection.

**SEC. 150. FUND.**

There is hereby established in the Treasury of the United States a separate fund to be known as the “Ultra-Deepwater and Unconventional Natural Gas and Other Petroleum Research Fund”.

**SEC. 151. SUNSET.**

The authority provided by this part shall terminate on September 30, 2010.

**SEC. 152. DEFINITIONS.**

In this section:

(1) **DEEPWATER.**—The term “deepwater” means a water depth that is greater than 200 but less than 1,500 meters.

(2) **PROGRAM CONSORTIUM.**—The term “program consortium” means the consortium selected under section 145(d).

(3) **REMOTE OR INCONSEQUENTIAL.**—The term “remote or inconsequential” has the meaning given that term in regulations issued by the Office of Government Ethics under section 208(b)(2) of title 18, United States Code.

(4) **ULTRA-DEEPWATER.**—The term “ultra-deepwater” means a water depth that is equal to or greater than 1,500 meters.

(5) **ULTRA-DEEPWATER ARCHITECTURE.**—The term “ultra-deepwater architecture” means the integration of technologies for the exploration for, or production of, natural gas or other petroleum resources located at ultra-deepwater depths.

(6) **ULTRA-DEEPWATER TECHNOLOGY.**—The term “ultra-deepwater technology” means a discrete technology that is specially suited to address one or more challenges associated with the exploration for, or production of, natural gas or other petroleum resources located at ultra-deepwater depths.

(7) **UNCONVENTIONAL NATURAL GAS AND OTHER PETROLEUM RESOURCE.**—The term “unconventional natural gas and other petroleum resource” means natural gas and other petroleum resource located onshore in an economically inaccessible geological formation.

## Subtitle F—Science

### PART 1—AUTHORIZATION OF APPROPRIATIONS

**SEC. 161. SCIENCE.**

(a) **IN GENERAL.**—The following sums are authorized to be appropriated to the Secretary for research, development, demonstration, and commercial application activities of the Office of Science, including activities authorized under this subtitle, including the amounts authorized under the amendment made by section 170(c)(2)(C)(ii), and including basic energy sciences, advanced scientific and com-

puting research, biological and environmental research, fusion energy sciences, high energy physics, nuclear physics, and research analysis and infrastructure support:

- (1) For fiscal year 2003, \$3,350,000,000.
- (2) For fiscal year 2004, \$3,785,000,000.
- (3) For fiscal year 2005, \$4,153,000,000.
- (4) For fiscal year 2006, \$4,586,000,000.
- (5) For fiscal year 2007, \$5,000,000,000.

(b) ALLOCATIONS.—From amounts authorized under subsection (a), the following sums are authorized:

(1) FUSION ENERGY SCIENCES.—For activities of the Fusion Energy Sciences Program, including activities under sections 162 and 163—

- (A) for fiscal year 2003, \$300,000,000;
- (B) for fiscal year 2004, \$335,000,000;
- (C) for fiscal year 2005, \$349,000,000;
- (D) for fiscal year 2006, \$362,000,000; and
- (E) for fiscal year 2007, \$377,000,000.

(2) SPALLATION NEUTRON SOURCE.—

(A) CONSTRUCTION.—For construction of the Spallation Neutron Source—

- (i) for fiscal year 2003, \$210,571,000;
- (ii) for fiscal year 2004, \$124,600,000;
- (iii) for fiscal year 2005, \$79,800,000; and
- (iv) for fiscal year 2006, \$41,100,000 for completion of construction.

(B) OTHER PROJECT FUNDING.—For other project costs (including research and development necessary to complete the project, preoperations costs, and capital equipment related to construction) of the Spallation Neutron Source, \$103,279,000 for the period encompassing fiscal years 2003 through 2006, to remain available until expended through September 30, 2006.

(3) NANOSCALE SCIENCE AND ENGINEERING RESEARCH.—

(A) TOTAL AUTHORIZATION.—For activities under section 169—

- (i) for fiscal year 2003, \$135,000,000;
- (ii) for fiscal year 2004, \$270,000,000;
- (iii) for fiscal year 2005, \$290,000,000;
- (iv) for fiscal year 2006, \$310,000,000; and
- (v) for fiscal year 2007, \$330,000,000.

(B) RESEARCH CENTERS AND MAJOR INSTRUMENTATION.—From the amounts authorized under subparagraph (A), the following sums are authorized to be appropriated to carry out section 169(c):

- (i) For fiscal year 2004, \$135,000,000.
- (ii) For fiscal year 2005, \$150,000,000.
- (iii) For fiscal year 2006, \$120,000,000.
- (iv) For fiscal year 2007, \$100,000,000.

(c) LIMITS ON USE OF FUNDS.—Of the funds authorized under subsection (b)(1), no funds shall be available for implementation of the plans described in sections 162 and 163.

## PART 2—FUSION ENERGY SCIENCES

### SEC. 162. PLAN FOR FUSION EXPERIMENT.

(a) PLAN FOR UNITED STATES FUSION EXPERIMENT.—The Secretary, after consultation with the Fusion Energy Sciences Advisory Committee, shall develop a plan for construction in the United States of a magnetic fusion burning plasma experiment for the purpose of accelerating scientific understanding of fusion plasmas. The Secretary shall request a review of the plan by the National Academy of Sciences, and shall transmit the plan and the review to the Congress by July 1, 2004.

(b) REQUIREMENTS OF PLAN.—The plan described in subsection (a) shall—

- (1) address key burning plasma physics issues; and
- (2) include specific information on the scientific capabilities of the proposed experiment, the relevance of these capabilities to the goal of practical fusion energy, and the overall design of the experiment including its estimated cost and potential construction sites.

(c) UNITED STATES PARTICIPATION IN AN INTERNATIONAL EXPERIMENT.—In addition to the plan described in subsection (a), the Secretary, after consultation with the Fusion Energy Sciences Advisory Committee, may also develop a plan for United States participation in an international burning plasma experiment for the same purpose, whose construction is found by the Secretary to be highly likely and where

United States participation is cost effective relative to the cost and scientific benefits of a domestic experiment described in subsection (a). If the Secretary elects to develop a plan under this subsection, it shall include the information described in subsection (b), and an estimate of the cost of United States participation in such an international experiment. The Secretary shall request a review by the National Academy of Sciences of a plan developed under this subsection, and shall transmit the plan and the review to the Congress not later than July 1, 2004.

(d) **AUTHORIZATION OF RESEARCH AND DEVELOPMENT.**—The Secretary, through the Office of Science, may conduct any research and development necessary to fully develop the plans described in this section.

**SEC. 163. PLAN FOR FUSION ENERGY SCIENCES PROGRAM.**

Not later than 6 months after the date of the enactment of this Act, the Secretary, after consultation with the Fusion Energy Sciences Advisory Committee, shall develop and transmit to the Congress a plan for the purpose of ensuring a strong scientific base for the Fusion Energy Sciences Program and to enable the experiments described in section 162. Such plan shall include as its objectives—

- (1) to ensure that existing fusion research facilities and equipment are more fully utilized with appropriate measurements and control tools;
- (2) to ensure a strengthened fusion science theory and computational base;
- (3) to ensure that the selection of and funding for new magnetic and inertial fusion research facilities are based on scientific innovation and cost effectiveness;
- (4) to improve the communication of scientific results and methods between the fusion science community and the wider scientific community;
- (5) to ensure that adequate support is provided to optimize the design of the magnetic fusion burning plasma experiments referred to in section 162;
- (6) to ensure that inertial confinement fusion facilities are utilized to the extent practicable for the purpose of inertial fusion energy research and development; and
- (7) to develop a fusion-based energy source.

### **PART 3—SPALLATION NEUTRON SOURCE**

**SEC. 164. DEFINITION.**

For the purposes of this part, the term “Spallation Neutron Source” means Department Project 99–E–334, Oak Ridge National Laboratory, Oak Ridge, Tennessee.

**SEC. 165. REPORT.**

The Secretary shall report on the Spallation Neutron Source as part of the Department’s annual budget submission, including a description of the achievement of milestones, a comparison of actual costs to estimated costs, and any changes in estimated project costs or schedule.

**SEC. 166. LIMITATIONS.**

The total amount obligated by the Department, including prior year appropriations, for the Spallation Neutron Source may not exceed—

- (1) \$1,192,700,000 for costs of construction;
- (2) \$219,000,000 for other project costs; and
- (3) \$1,411,700,000 for total project cost.

### **PART 4—MISCELLANEOUS**

**SEC. 167. FACILITY AND INFRASTRUCTURE SUPPORT FOR NONMILITARY ENERGY LABORATORIES.**

(a) **FACILITY POLICY.**—The Secretary shall develop and implement a strategy for the nonmilitary energy laboratories and facilities of the Office of Science. Such strategy shall provide a cost-effective means for—

- (1) maintaining existing facilities and infrastructure, as needed;
- (2) closing unneeded facilities;
- (3) making facility modifications; and
- (4) building new facilities.

(b) **REPORT.**—

(1) **TRANSMITTAL.**—The Secretary shall prepare and transmit, along with the President’s budget request to the Congress for fiscal year 2005, a report containing the strategy developed under subsection (a).

(2) CONTENTS.—For each nonmilitary energy laboratory and facility, such report shall contain——

(A) the current priority list of proposed facilities and infrastructure projects, including cost and schedule requirements;

(B) a current ten-year plan that demonstrates the reconfiguration of its facilities and infrastructure to meet its missions and to address its long-term operational costs and return on investment;

(C) the total current budget for all facilities and infrastructure funding; and

(D) the current status of each facilities and infrastructure project compared to the original baseline cost, schedule, and scope.

**SEC. 168. RESEARCH REGARDING PRECIOUS METAL CATALYSIS.**

From the amounts authorized to be appropriated to the Secretary under section 161, such sums as may be necessary for each of the fiscal years 2003, 2004, and 2005 may be used to carry out research in the use of precious metals (excluding platinum, palladium, and rhodium) in catalysis.

**SEC. 169. NANOSCALE SCIENCE AND ENGINEERING RESEARCH.**

(a) ESTABLISHMENT.—The Secretary, acting through the Office of Science, shall support a program of research, development, demonstration, and commercial application in nanoscience and nanoengineering. The program shall include efforts to further the understanding of the chemistry, physics, materials science, and engineering of phenomena on the scale of 1 to 100 nanometers.

(b) DUTIES OF THE OFFICE OF SCIENCE.—In carrying out the program under this section, the Office of Science shall——

(1) support both individual investigators and teams of investigators, including multidisciplinary teams;

(2) carry out activities under subsection (c);

(3) support technology transfer activities to benefit industry and other users of nanoscience and nanoengineering; and

(4) coordinate research and development activities with industry and other Federal agencies.

(c) NANOSCIENCE AND NANOENGINEERING RESEARCH CENTERS AND MAJOR INSTRUMENTATION.—

(1) IN GENERAL.—The Secretary shall carry out projects to develop, plan, construct, acquire, operate, or support special equipment, instrumentation, or facilities for investigators conducting research and development in nanoscience and nanoengineering.

(2) PROJECTS.—Projects under paragraph (1) may include the measurement of properties at the scale of 1 to 100 nanometers, manipulation at such scales, and the integration of technologies based on nanoscience or nanoengineering into bulk materials or other technologies.

(3) FACILITIES.—Facilities under paragraph (1) may include electron micro-characterization facilities, microlithography facilities, scanning probe facilities, and related instrumentation.

(4) COLLABORATION.—The Secretary shall encourage collaborations among institutions of higher education, laboratories, and industry at facilities under this subsection.

**SEC. 170. ADVANCED SCIENTIFIC COMPUTING FOR ENERGY MISSIONS.**

(a) IN GENERAL.—The Secretary, acting through the Office of Science, shall support a program to advance the Nation's computing capability across a diverse set of grand challenge computationally based science problems related to departmental missions.

(b) DUTIES OF THE OFFICE OF SCIENCE.—In carrying out the program under this section, the Office of Science shall——

(1) advance basic science through computation by developing software to solve grand challenge science problems on new generations of computing platforms;

(2) enhance the foundations for scientific computing by developing the basic mathematical and computing systems software needed to take full advantage of the computing capabilities of computers with peak speeds of 100 teraflops or more, some of which may be unique to the scientific problem of interest;

(3) enhance national collaborative and networking capabilities by developing software to integrate geographically separated researchers into effective research teams and to facilitate access to and movement and analysis of large (petabyte) data sets;

- (4) maintain a robust scientific computing hardware infrastructure to ensure that the computing resources needed to address departmental missions are available; and
- (5) explore new computing approaches and technologies that promise to advance scientific computing.
- (c) HIGH-PERFORMANCE COMPUTING ACT OF 1991 AMENDMENTS.—The High-Performance Computing Act of 1991 is amended—
- (1) in section 4 (15 U.S.C. 5503)—
- (A) in paragraph (3)—
- (i) by striking “means” and inserting “and ‘networking and information technology’ mean”; and
- (ii) by striking “(including vector supercomputers and large scale parallel systems)”; and
- (B) in paragraph (4), by striking “packet switched”; and
- (2) in section 203 (15 U.S.C. 5523)—
- (A) in subsection (a), by striking all after “As part of the” and inserting “Networking and Information Technology Research and Development Program, the Secretary of Energy shall conduct basic and applied research in networking and information technology, with emphasis on—
- “(1) supporting fundamental research in the physical sciences and engineering, and energy applications;
- “(2) providing supercomputer access and advanced communication capabilities and facilities to scientific researchers; and
- “(3) developing tools for distributed scientific collaboration.”;
- (B) in subsection (b), by striking “Program” and inserting “Networking and Information Technology Research and Development Program”; and
- (C) in subsection (e)—
- (i) by striking “(1)”; and
- (ii) by striking “the Program” and all that follows through “fiscal year 1996” and inserting “carrying out this section \$285,000,000 for fiscal year 2003, \$300,000,000 for fiscal year 2004, \$310,000,000 for fiscal year 2005, and \$320,000,000 for fiscal year 2006”; and
- (iii) by striking paragraph (2).
- (d) COORDINATION.—The Secretary shall ensure that the program under this section is integrated and consistent with—
- (1) the Accelerated Strategic Computing Initiative of the National Nuclear Security Administration; and
- (2) other national efforts related to advanced scientific computing for science and engineering.
- (e) REPORT.—(1) Before undertaking any new initiative to develop new advanced architecture for high-speed computing, the Secretary, through the Director of the Office of Science, shall transmit a report to the Congress describing—
- (A) the expected duration and cost of the initiative;
- (B) the technical milestones the initiative is designed to achieve;
- (C) how institutions of higher education and private firms will participate in the initiative; and
- (D) why the goals of the initiative could not be achieved through existing programs.
- (2) No funds may be expended on any initiative described in paragraph (1) until 30 days after the report required by that paragraph is transmitted to the Congress.

## Subtitle G—Energy and Environment

### SEC. 171. AUTHORIZATION OF APPROPRIATIONS.

(a) UNITED STATES-MEXICO ENERGY TECHNOLOGY COOPERATION.—The following sums are authorized to be appropriated to the Secretary to carry out activities under section 172:

- (1) For fiscal year 2003, \$5,000,000.
- (2) For fiscal year 2004, \$5,000,000.
- (3) For fiscal year 2005, \$6,000,000.
- (4) For fiscal year 2006, \$6,000,000.
- (5) For fiscal year 2007, \$6,000,000.

(b) WASTE REDUCTION AND USE OF ALTERNATIVES.—There are authorized to be appropriated to the Secretary to carry out activities under section 173, \$500,000 for fiscal year 2003.

**SEC. 172. UNITED STATES-MEXICO ENERGY TECHNOLOGY COOPERATION.**

(a) PROGRAM.—The Secretary shall establish a research, development, demonstration, and commercial application program to be carried out in collaboration with entities in Mexico and the United States to promote energy efficient, environmentally sound economic development along the United States-Mexico border.

(b) PROGRAM MANAGEMENT.—The program under subsection (a) shall be managed by the Department of Energy Carlsbad Environmental Management Field Office.

(c) TECHNOLOGY TRANSFER.—In carrying out projects and activities under this section, the Secretary shall assess the applicability of technology developed under the Environmental Management Science Program of the Department.

(d) INTELLECTUAL PROPERTY.—In carrying out this section, the Secretary shall comply with the requirements of any agreement entered into between the United States and Mexico regarding intellectual property protection.

**SEC. 173. WASTE REDUCTION AND USE OF ALTERNATIVES.**

(a) GRANT AUTHORITY.—The Secretary is authorized to make a single grant to a qualified institution to examine and develop the feasibility of burning post-consumer carpet in cement kilns as an alternative energy source. The purposes of the grant shall include determining—

- (1) how post-consumer carpet can be burned without disrupting kiln operations;
- (2) the extent to which overall kiln emissions may be reduced;
- (3) the emissions of air pollutants and other relevant environmental impacts; and
- (4) how this process provides benefits to both cement kiln operations and carpet suppliers.

(b) QUALIFIED INSTITUTION.—For the purposes of subsection (a), a qualified institution is a research-intensive institution of higher education with demonstrated expertise in the fields of fiber recycling and logistical modeling of carpet waste collection and preparation.

**SEC. 174. COAL GASIFICATION.**

The Secretary is authorized to provide loan guarantees for a project to produce energy from a plant using integrated gasification combined cycle technology of at least 400 megawatts in capacity that produces power at competitive rates in deregulated energy generation markets and that does not receive any subsidy (direct or indirect) from ratepayers.

**SEC. 175. PETROLEUM COKE GASIFICATION.**

The Secretary is authorized to provide loan guarantees for at least one petroleum coke gasification polygeneration project.

**SEC. 176. OTHER BIPOWER AND BIOENERGY.**

The Secretary shall conduct a program to assist in the planning, design, and implementation of projects to convert rice straw, rice hulls, sugarcane bagasse, forest thinnings, and barley grain into biopower and biofuels.

**SEC. 177. TECHNOLOGY TRANSFER.**

There are authorized to be appropriated to the Secretary \$1,000,000 for a competitively awarded contract, to an entity with offshore oil and gas management experience, for the transfer of technologies relating to ultra-deepwater research and development developed at the Naval Surface Warfare Center, Carderock Division.

**SEC. 178. COAL TECHNOLOGY LOAN.**

There are authorized to be appropriated to the Secretary \$125,000,000 to provide a loan to the owner of the experimental plant constructed under United States Department of Energy cooperative agreement number DE-FC22-91PC99544 on such terms and conditions as the Secretary determines, including interest rates and upfront payments.

## Subtitle H—Management

**SEC. 181. AVAILABILITY OF FUNDS.**

Funds authorized to be appropriated to the Department under this title shall remain available until expended.

**SEC. 182. COST SHARING.**

(a) RESEARCH AND DEVELOPMENT.—Except as otherwise provided in this title, for research and development programs carried out under this title, the Secretary shall require a commitment from non-Federal sources of at least 20 percent of the cost of the project. The Secretary may reduce or eliminate the non-Federal requirement under this subsection if the Secretary determines that the research and development is of a basic or fundamental nature.

(b) DEMONSTRATION AND COMMERCIAL APPLICATION.—Except as otherwise provided in this title, the Secretary shall require at least 50 percent of the costs directly and specifically related to any demonstration or commercial application project under this title to be provided from non-Federal sources. The Secretary may reduce the non-Federal requirement under this subsection if the Secretary determines that the reduction is necessary and appropriate considering the technological risks involved in the project and is necessary to meet the objectives of this title.

(c) CALCULATION OF AMOUNT.—In calculating the amount of the non-Federal commitment under subsection (a) or (b), the Secretary may include personnel, services, equipment, and other resources.

**SEC. 183. MERIT REVIEW OF PROPOSALS.**

Awards of funds authorized under this title shall be made only after an impartial review of the scientific and technical merit of the proposals for such awards has been carried out by or for the Department.

**SEC. 184. EXTERNAL TECHNICAL REVIEW OF DEPARTMENTAL PROGRAMS.**

(a) NATIONAL ENERGY RESEARCH AND DEVELOPMENT ADVISORY BOARDS.—(1) The Secretary shall establish one or more advisory boards to review Department research, development, demonstration, and commercial application programs in the following areas:

- (A) Energy efficiency.
- (B) Renewable energy.
- (C) Nuclear energy.
- (D) Fossil energy.

(2) The Secretary may designate an existing advisory board within the Department to fulfill the responsibilities of an advisory board under this subsection, and may enter into appropriate arrangements with the National Academy of Sciences to establish such an advisory board.

(b) UTILIZATION OF EXISTING COMMITTEES.—The Secretary shall continue to use the scientific program advisory committees chartered under the Federal Advisory Committee Act by the Office of Science to oversee research and development programs under that Office.

(c) MEMBERSHIP.—Each advisory board under this section shall consist of persons with appropriate expertise representing a diverse range of interests.

(d) MEETINGS AND PURPOSES.—Each advisory board under this section shall meet at least semi-annually to review and advise on the progress made by the respective research, development, demonstration, and commercial application program or programs. The advisory board shall also review the measurable cost and performance-based goals for such programs as established under section 102, and the progress on meeting such goals.

(e) PERIODIC REVIEWS AND ASSESSMENTS.—The Secretary shall enter into appropriate arrangements with the National Academy of Sciences to conduct periodic reviews and assessments of the programs authorized by this title, the measurable cost and performance-based goals for such programs as established under section 102, if any, and the progress on meeting such goals. Such reviews and assessments shall be conducted every 5 years, or more often as the Secretary considers necessary, and the Secretary shall transmit to the Congress reports containing the results of all such reviews and assessments.

**SEC. 185. IMPROVED COORDINATION OF TECHNOLOGY TRANSFER ACTIVITIES.**

(a) TECHNOLOGY TRANSFER COORDINATOR.—The Secretary shall designate a Technology Transfer Coordinator to perform oversight of and policy development for technology transfer activities at the Department. The Technology Transfer Coordinator shall coordinate the activities of the Technology Transfer Working Group, and shall oversee the expenditure of funds allocated to the Technology Transfer Working Group, and shall coordinate with each technology partnership ombudsman appointed under section 11 of the Technology Transfer Commercialization Act of 2000 (42 U.S.C. 7261c).

(b) TECHNOLOGY TRANSFER WORKING GROUP.—The Secretary shall establish a Technology Transfer Working Group, which shall consist of representatives of the National Laboratories and single-purpose research facilities, to——

(1) coordinate technology transfer activities occurring at National Laboratories and single-purpose research facilities;

(2) exchange information about technology transfer practices, including alternative approaches to resolution of disputes involving intellectual property rights and other technology transfer matters; and

(3) develop and disseminate to the public and prospective technology partners information about opportunities and procedures for technology transfer with the Department, including those related to alternative approaches to resolution of disputes involving intellectual property rights and other technology transfer matters.

(c) **TECHNOLOGY TRANSFER RESPONSIBILITY.**—Nothing in this section shall affect the technology transfer responsibilities of Federal employees under the Stevenson-Wydler Technology Innovation Act of 1980.

**SEC. 186. TECHNOLOGY INFRASTRUCTURE PROGRAM.**

(a) **ESTABLISHMENT.**—The Secretary shall establish a Technology Infrastructure Program in accordance with this section.

(b) **PURPOSE.**—The purpose of the Technology Infrastructure Program shall be to improve the ability of National Laboratories and single-purpose research facilities to support departmental missions by—

(1) stimulating the development of technology clusters that can support departmental missions at the National Laboratories or single-purpose research facilities;

(2) improving the ability of National Laboratories and single-purpose research facilities to leverage and benefit from commercial research, technology, products, processes, and services; and

(3) encouraging the exchange of scientific and technological expertise between National Laboratories or single-purpose research facilities and—

(A) institutions of higher education;

(B) technology-related business concerns;

(C) nonprofit institutions; and

(D) agencies of State, tribal, or local governments,

that can support departmental missions at the National Laboratories or single-purpose research facilities.

(c) **PROJECTS.**—The Secretary shall authorize the Director of each National Laboratory or single-purpose research facility to implement the Technology Infrastructure Program at such National Laboratory or facility through projects that meet the requirements of subsections (d) and (e).

(d) **PROGRAM REQUIREMENTS.**—Each project funded under this section shall meet the following requirements:

(1) **MINIMUM PARTICIPANTS.**—Each project shall at a minimum include one of the following entities:

(A) A business.

(B) An institution of higher education.

(C) A nonprofit institution.

(D) An agency of a State, local, or tribal government.

(2) **COST SHARING.**—

(A) **MINIMUM AMOUNT.**—Not less than 50 percent of the costs of each project funded under this section shall be provided from non-Federal sources.

(B) **QUALIFIED FUNDING AND RESOURCES.**—(i) The calculation of costs paid by the non-Federal sources to a project shall include cash, personnel, services, equipment, and other resources expended on the project.

(ii) Independent research and development expenses of Government contractors that qualify for reimbursement under section 31–205–18(e) of the Federal Acquisition Regulations issued pursuant to section 25(c)(1) of the Office of Federal Procurement Policy Act (41 U.S.C. 421(c)(1)) may be credited towards costs paid by non-Federal sources to a project, if the expenses meet the other requirements of this section.

(iii) No funds or other resources expended either before the start of a project under this section or outside the project's scope of work shall be credited toward the costs paid by the non-Federal sources to the project.

(3) **COMPETITIVE SELECTION.**—All projects under this section shall be competitively selected using procedures determined by the Secretary.

(4) **ACCOUNTING STANDARDS.**—Any participant that receives funds under this section may use generally accepted accounting principles for maintaining accounts, books, and records relating to the project.

(5) LIMITATIONS.—No Federal funds shall be made available under this section for—

- (A) construction; or
- (B) any project for more than 5 years.

(e) SELECTION CRITERIA.—

(1) THRESHOLD FUNDING CRITERIA.—The Secretary shall allocate funds under this section only if the Director of the National Laboratory or single-purpose research facility managing the project determines that the project is likely to improve the ability of the National Laboratory or single-purpose research facility to achieve technical success in meeting departmental missions.

(2) ADDITIONAL CRITERIA.—The Secretary shall consider the following criteria in selecting a project to receive Federal funds:

(A) The potential of the project to succeed, based on its technical merit, team members, management approach, resources, and project plan.

(B) The potential of the project to promote the development of a commercially sustainable technology cluster, which will derive most of the demand for its products or services from the private sector, and which will support departmental missions at the participating National Laboratory or single-purpose research facility.

(C) The potential of the project to promote the use of commercial research, technology, products, processes, and services by the participating National Laboratory or single-purpose research facility to achieve its departmental mission or the commercial development of technological innovations made at the participating National Laboratory or single-purpose research facility.

(D) The commitment shown by non-Federal organizations to the project, based primarily on the nature and amount of the financial and other resources they will risk on the project.

(E) The extent to which the project involves a wide variety and number of institutions of higher education, nonprofit institutions, and technology-related business concerns that can support the missions of the participating National Laboratory or single-purpose research facility and that will make substantive contributions to achieving the goals of the project.

(F) The extent of participation in the project by agencies of State, tribal, or local governments that will make substantive contributions to achieving the goals of the project.

(G) The extent to which the project focuses on promoting the development of technology-related business concerns that are small businesses or involves such small businesses substantively in the project.

(H) Such other criteria as the Secretary determines to be appropriate.

(f) ALLOCATION.—In allocating funds for projects approved under this section, the Secretary shall provide—

(1) the Federal share of the project costs; and

(2) additional funds to the National Laboratory or single-purpose research facility managing the project to permit the National Laboratory or single-purpose research facility to carry out activities relating to the project, and to coordinate such activities with the project.

(g) REPORT TO CONGRESS.—Not later than January 1, 2005, the Secretary shall report to Congress on whether the Technology Infrastructure Program should be continued and, if so, how the program should be managed.

(h) DEFINITIONS.—In this section:

(1) TECHNOLOGY CLUSTER.—The term “technology cluster” means a group of—

- (A) technology-related business concerns;
- (B) institutions of higher education; or
- (C) other nonprofit institutions,

that reinforce each other’s performance in the areas of technology development through formal or informal relationships.

(2) TECHNOLOGY-RELATED BUSINESS CONCERN.—The term “technology-related business concern” means a for-profit corporation, company, association, firm, partnership, or small business concern that—

- (A) conducts scientific or engineering research;
- (B) develops new technologies;
- (C) manufactures products based on new technologies; or
- (D) performs technological services.

(i) AUTHORIZATION OF APPROPRIATIONS.—There are authorized to be appropriated to the Secretary for activities under this section \$10,000,000 for each of fiscal years 2003 and 2004.

**SEC. 187. SMALL BUSINESS ADVOCACY AND ASSISTANCE.**

(a) **SMALL BUSINESS ADVOCATE.**—The Secretary shall require the Director of each National Laboratory, and may require the Director of a single-purpose research facility, to designate a small business advocate to——

(1) increase the participation of small business concerns, including socially and economically disadvantaged small business concerns, in procurement, collaborative research, technology licensing, and technology transfer activities conducted by the National Laboratory or single-purpose research facility;

(2) report to the Director of the National Laboratory or single-purpose research facility on the actual participation of small business concerns in procurement and collaborative research along with recommendations, if appropriate, on how to improve participation;

(3) make available to small business concerns training, mentoring, and clear, up-to-date information on how to participate in the procurement and collaborative research, including how to submit effective proposals, and information related to alternative approaches to resolution of disputes involving intellectual property rights and other technology transfer matters;

(4) increase the awareness inside the National Laboratory or single-purpose research facility of the capabilities and opportunities presented by small business concerns; and

(5) establish guidelines for the program under subsection (b) and report on the effectiveness of such program to the Director of the National Laboratory or single-purpose research facility.

(b) **ESTABLISHMENT OF SMALL BUSINESS ASSISTANCE PROGRAM.**—The Secretary shall require the Director of each National Laboratory, and may require the Director of a single-purpose research facility, to establish a program to provide small business concerns——

(1) assistance directed at making them more effective and efficient subcontractors or suppliers to the National Laboratory or single-purpose research facility; or

(2) general technical assistance, the cost of which shall not exceed \$10,000 per instance of assistance, to improve the small business concern's products or services.

(c) **USE OF FUNDS.**—None of the funds expended under subsection (b) may be used for direct grants to the small business concerns.

(d) **DEFINITIONS.**—In this section:

(1) **SMALL BUSINESS CONCERN.**—The term “small business concern” has the meaning given such term in section 3 of the Small Business Act (15 U.S.C. 632).

(2) **SOCIALLY AND ECONOMICALLY DISADVANTAGED SMALL BUSINESS CONCERNS.**—The term “socially and economically disadvantaged small business concerns” has the meaning given such term in section 8(a)(4) of the Small Business Act (15 U.S.C. 637(a)(4)).

**SEC. 188. MOBILITY OF SCIENTIFIC AND TECHNICAL PERSONNEL.**

Not later than 2 years after the date of enactment of this section, the Secretary shall transmit a report to the Congress identifying any policies or procedures of a contractor operating a National Laboratory or single-purpose research facility that create disincentives to the temporary transfer of scientific and technical personnel among the contractor-operated National Laboratories or contractor-operated single-purpose research facilities.

**SEC. 189. NATIONAL ACADEMY OF SCIENCES REPORT.**

Within 90 days after the date of enactment of this Act, the Secretary shall enter into an arrangement with the National Academy of Sciences for the Academy to——

(1) conduct a study on——

(A) the obstacles to accelerating the research, development, demonstration, and commercial application cycle for energy technology; and

(B) the adequacy of Department policies and procedures for, and oversight of, technology transfer-related disputes between contractors of the Department and the private sector; and

(2) report to the Congress on recommendations developed as a result of the study.

**SEC. 190. OUTREACH.**

The Secretary shall ensure that each program authorized by this title includes an outreach component to provide information, as appropriate, to manufacturers, consumers, engineers, architects, builders, energy service companies, institutions of

higher education, facility planners and managers, State and local governments, and other entities.

**SEC. 191. LIMITS ON USE OF FUNDS.**

(a) **COMPETITIVE PROCEDURE REQUIREMENT.**—None of the funds authorized to be appropriated to the Secretary by this title may be used to award a management and operating contract for a nonmilitary energy laboratory of the Department unless such contract is competitively awarded or the Secretary grants, on a case-by-case basis, a waiver to allow for such a deviation. The Secretary may not delegate the authority to grant such a waiver.

(b) **CONGRESSIONAL NOTICE.**—At least 2 months before a contract award for which the Secretary intends to grant such a waiver, the Secretary shall submit to the Congress a report notifying the Congress of the waiver and setting forth the reasons for the waiver.

**SEC. 192. REPROGRAMMING.**

(a) **DISTRIBUTION REPORT.**—Not later than 60 days after the date of the enactment of an Act appropriating amounts authorized under this title, the Secretary shall transmit to the appropriate authorizing committees of the Congress a report explaining how such amounts will be distributed among the authorizations contained in this title.

(b) **PROHIBITION.**—(1) No amount identified under subsection (a) shall be reprogrammed if such reprogramming would result in an obligation which changes an individual distribution required to be reported under subsection (a) by more than 5 percent unless the Secretary has transmitted to the appropriate authorizing committees of the Congress a report described in subsection (c) and a period of 30 days has elapsed after such committees receive the report.

(2) In the computation of the 30-day period described in paragraph (1), there shall be excluded any day on which either House of Congress is not in session because of an adjournment of more than 3 days to a day certain.

(c) **REPROGRAMMING REPORT.**—A report referred to in subsection (b)(1) shall contain a full and complete statement of the action proposed to be taken and the facts and circumstances relied on in support of the proposed action.

**SEC. 193. CONSTRUCTION WITH OTHER LAWS.**

Except as otherwise provided in this title, the Secretary shall carry out the research, development, demonstration, and commercial application programs, projects, and activities authorized by this title in accordance with the applicable provisions of the Atomic Energy Act of 1954 (42 U.S.C. et seq.), the Federal Nonnuclear Research and Development Act of 1974 (42 U.S.C. 5901 et seq.), the Energy Policy Act of 1992 (42 U.S.C. 13201 et seq.), the Stevenson-Wydler Technology Innovation Act of 1980 (15 U.S.C. 3701 et seq.), chapter 18 of title 35, United States Code (commonly referred to as the Bayh-Dole Act), and any other Act under which the Secretary is authorized to carry out such activities.

## **TITLE II—DEPARTMENT OF ENERGY MANAGEMENT**

**SEC. 201. IMPROVED COORDINATION AND MANAGEMENT OF CIVILIAN SCIENCE AND TECHNOLOGY PROGRAMS.**

(a) **RECONFIGURATION OF POSITION OF DIRECTOR OF THE OFFICE OF SCIENCE.**—Section 209 of the Department of Energy Organization Act (41 U.S.C. 7139) is amended to read as follows:

“OFFICE OF SCIENCE

“SEC. 209. (a) There shall be within the Department an Office of Science, to be headed by an Assistant Secretary of Science, who shall be appointed by the President, by and with the advice and consent of the Senate, and who shall be compensated at the rate provided for level IV of the Executive Schedule under section 5315 of title 5, United States Code.

“(b) The Assistant Secretary of Science shall be in addition to the Assistant Secretaries provided for under section 203 of this Act.

“(c) It shall be the duty and responsibility of the Assistant Secretary of Science to carry out the fundamental science and engineering research functions of the Department, including the responsibility for policy and management of such research, as well as other functions vested in the Secretary which he may assign to the Assistant Secretary.”.

(b) **ADDITIONAL ASSISTANT SECRETARY POSITION TO ENABLE IMPROVED MANAGEMENT OF NUCLEAR ENERGY ISSUES.**—(1) Section 203(a) of the Department of Energy Organization Act (42 U.S.C. 7133(a)) is amended by striking “There shall be in the Department six Assistant Secretaries” and inserting “Except as provided in section 209, there shall be in the Department seven Assistant Secretaries”.

(2) It is the sense of the Congress that the leadership for departmental missions in nuclear energy should be at the Assistant Secretary level.

(c) **TECHNICAL AND CONFORMING AMENDMENTS.**—(1) Section 5315 of title 5, United States Code, is amended by—

(A) striking “Director, Office of Science, Department of Energy.”; and

(B) striking “Assistant Secretaries of Energy (6)” and inserting “Assistant Secretaries of Energy (8)”.

(2) The table of contents for the Department of Energy Organization Act (42 U.S.C. 7101 note) is amended—

(A) by striking “Section 209” and inserting “Sec. 209”;

(B) by striking “213.” and inserting “Sec. 213.”;

(C) by striking “214.” and inserting “Sec. 214.”;

(D) by striking “215.” and inserting “Sec. 215.”; and

(E) by striking “216.” and inserting “Sec. 216.”.

## **TITLE III—CLEAN SCHOOL BUSES**

### **SEC. 301. ESTABLISHMENT OF PILOT PROGRAM.**

(a) **ESTABLISHMENT.**—The Secretary of Energy, in consultation with the Administrator of the Environmental Protection Agency, shall establish a pilot program for awarding grants on a competitive basis to eligible entities for the demonstration and commercial application of alternative fuel school buses and ultra-low sulfur diesel school buses.

(b) **REQUIREMENTS.**—Not later than 3 months after the date of the enactment of this Act, the Secretary shall establish and publish in the Federal register grant requirements on eligibility for assistance, and on implementation of the program established under subsection (a), including certification requirements to ensure compliance with this title.

(c) **SOLICITATION.**—Not later than 6 months after the date of the enactment of this Act, the Secretary shall solicit proposals for grants under this section.

(d) **ELIGIBLE RECIPIENTS.**—A grant shall be awarded under this section only—

(1) to a local or State governmental entity responsible for providing school bus service to one or more public school systems or responsible for the purchase of school buses; or

(2) to a contracting entity that provides school bus service to one or more public school systems, if the grant application is submitted jointly with the school system or systems which the buses will serve.

(e) **TYPES OF GRANTS.**—

(1) **IN GENERAL.**—Grants under this section shall be for the demonstration and commercial application of technologies to facilitate the use of alternative fuel school buses and ultra-low sulfur diesel school buses in lieu of buses manufactured before model year 1977 and diesel-powered buses manufactured before model year 1991.

(2) **NO ECONOMIC BENEFIT.**—Other than the receipt of the grant, a recipient of a grant under this section may not receive any economic benefit in connection with the receipt of the grant.

(3) **PRIORITY OF GRANT APPLICATIONS.**—The Secretary shall give priority to awarding grants to applicants who can demonstrate the use of alternative fuel buses and ultra-low sulfur diesel school buses in lieu of buses manufactured before model year 1977.

(f) **CONDITIONS OF GRANT.**—A grant provided under this section shall include the following conditions:

(1) All buses acquired with funds provided under the grant shall be operated as part of the school bus fleet for which the grant was made for a minimum of 5 years.

(2) Funds provided under the grant may only be used——

(A) to pay the cost, except as provided in paragraph (3), of new alternative fuel school buses or ultra-low sulfur diesel school buses, including State taxes and contract fees; and

(B) to provide——

(i) up to 10 percent of the price of the alternative fuel buses acquired, for necessary alternative fuel infrastructure if the infrastructure will only be available to the grant recipient; and

(ii) up to 15 percent of the price of the alternative fuel buses acquired, for necessary alternative fuel infrastructure if the infrastructure will be available to the grant recipient and to other bus fleets.

(3) The grant recipient shall be required to provide at least the lesser of 15 percent of the total cost of each bus received or \$15,000 per bus.

(4) In the case of a grant recipient receiving a grant to demonstrate ultra-low sulfur diesel school buses, the grant recipient shall be required to provide documentation to the satisfaction of the Secretary that diesel fuel containing sulfur at not more than 15 parts per million is available for carrying out the purposes of the grant, and a commitment by the applicant to use such fuel in carrying out the purposes of the grant.

(g) BUSES.—Funding under a grant made under this section may be used to demonstrate the use only of new alternative fuel school buses or ultra-low sulfur diesel school buses——

(1) with a gross vehicle weight of greater than 14,000 pounds;

(2) that are powered by a heavy duty engine;

(3) that, in the case of alternative fuel school buses manufactured in model years 2003 through 2006, emit not more than 1.8 grams per brake horsepower-hour of nonmethane hydrocarbons and oxides of nitrogen and .01 grams per brake horsepower-hour of particulate matter; and

(4) that, in the case of ultra-low sulfur diesel school buses, emit not more than——

(A) for buses manufactured in model year 2003, 3.0 grams per brake horsepower-hour of oxides of nitrogen and .01 grams per brake horsepower-hour of particulate matter; and

(B) for buses manufactured in model years 2004 through 2006, 2.5 grams per brake horsepower-hour of nonmethane hydrocarbons and oxides of nitrogen and .01 grams per brake horsepower-hour of particulate matter, except that under no circumstances shall buses be acquired under this section that emit nonmethane hydrocarbons, oxides of nitrogen, or particulate matter at a rate greater than the best performing technology of the same class of ultra-low sulfur diesel school buses commercially available at the time the grant is made.

(h) DEPLOYMENT AND DISTRIBUTION.—The Secretary shall seek to the maximum extent practicable to achieve nationwide deployment of alternative fuel school buses and ultra-low sulfur diesel school buses through the program under this section, and shall ensure a broad geographic distribution of grant awards, with a goal of no State receiving more than 10 percent of the grant funding made available under this section for a fiscal year.

(i) LIMIT ON FUNDING.—The Secretary shall provide not less than 20 percent and not more than 25 percent of the grant funding made available under this section for any fiscal year for the acquisition of ultra-low sulfur diesel school buses.

(j) ANNUAL REPORT.—Not later than January 31 of each year, the Secretary of Energy shall provide a report evaluating implementation of the program under this title to the Congress. Such report shall include the total number of grant applications received, the number and types of alternative fuel buses and ultra-low sulfur diesel school buses requested in grant applications, a list of grants awarded and the criteria used to select the grant recipients, certified engine emission levels of all buses purchased under the program, and any other information the Secretary considers appropriate.

(k) DEFINITIONS.—For purposes of this section——

(1) the term “alternative fuel school bus” means a bus powered substantially by electricity (including electricity supplied by a fuel cell), or by liquefied natural gas, compressed natural gas, liquefied petroleum gas, hydrogen, propane, or methanol or ethanol at no less than 85 percent by volume; and

(2) the term “ultra-low sulfur diesel school bus” means a school bus powered by diesel fuel which contains sulfur at not more than 15 parts per million.

**SEC. 302. FUEL CELL BUS DEVELOPMENT AND DEMONSTRATION PROGRAM.**

(a) **ESTABLISHMENT OF PROGRAM.**—The Secretary shall establish a program for entering into cooperative agreements with private sector fuel cell bus developers for the development of fuel cell-powered school buses, and subsequently with not less than 2 units of local government using natural gas-powered school buses and such private sector fuel cell bus developers to demonstrate the use of fuel cell-powered school buses.

(b) **COST SHARING.**—The non-Federal contribution for activities funded under this section shall be not less than—

(1) 20 percent for fuel infrastructure development activities; and

(2) 50 percent for demonstration activities and for development activities not described in paragraph (1).

(c) **FUNDING.**—No more than \$25,000,000 of the amounts authorized under section 303 may be used for carrying out this section for the period encompassing fiscal years 2004 through 2006.

(d) **REPORTS TO CONGRESS.**—Not later than 3 years after the date of the enactment of this Act, and not later than October 1, 2006, the Secretary shall transmit to the Congress a report that—

(1) evaluates the process of converting natural gas infrastructure to accommodate fuel cell-powered school buses; and

(2) assesses the results of the development and demonstration program under this section.

**SEC. 303. AUTHORIZATION OF APPROPRIATIONS.**

There are authorized to be appropriated to the Secretary for carrying out this title, to remain available until expended—

(1) \$60,000,000 for fiscal year 2003;

(2) \$70,000,000 for fiscal year 2004;

(3) \$80,000,000 for fiscal year 2005; and

(4) \$90,000,000 for fiscal year 2006.

## **TITLE IV—ALTERNATIVE FUELED AND ADVANCED VEHICLES**

**SEC. 401. DEFINITIONS.**

For the purposes of this title, the following definitions apply:

(1) **ALTERNATIVE FUELED VEHICLE.**—The term “alternative fueled vehicle” means a vehicle propelled solely on an alternative fuel as defined in section 301 of the Energy Policy Act (42 U.S.C. 13211), except the term does not include any vehicle that the Secretary determines, by rule, does not yield substantial environmental benefits over a vehicle operating solely on gasoline or diesel derived from fossil fuels.

(2) **FUEL CELL VEHICLE.**—The term “fuel cell vehicle” means a vehicle propelled by one or more cells that convert chemical energy directly into electricity by combining oxygen with hydrogen fuel which is stored on board the vehicle in any form and may or may not require reformation prior to use.

(3) **HYBRID VEHICLE.**—The term “hybrid vehicle” means a medium or heavy duty vehicle propelled by an internal combustion engine using any combustible fuel and an onboard rechargeable battery storage system.

(4) **NEIGHBORHOOD ELECTRIC VEHICLE.**—The term “neighborhood electric vehicle” means a motor vehicle that qualifies as both—

(A) a low-speed vehicle, as such term is defined in section 571.3(b) of title 49, Code of Federal Regulations; and

(B) a zero-emission vehicle, as such term is defined in section 86.1702–99 of title 40, Code of Federal Regulations.

(5) **PILOT PROGRAM.**—The term “pilot program” means the competitive grant program established under section 402.

(6) **ULTRA-LOW SULFUR DIESEL VEHICLE.**—The term “ultra-low sulfur diesel vehicle” means a vehicle manufactured in model years 2004 through 2006 powered by a heavy-duty diesel engine that—

(A) is fueled by diesel fuel which contains sulfur at not more than 15 parts per million; and

(B) emits not more than the lesser of—

(i) for vehicles manufactured in—

(I) model year 2003, 3.0 grams per brake horsepower-hour of oxides of nitrogen and .01 grams per brake horsepower-hour of particulate matter; and

(II) model years 2004 through 2006, 2.5 grams per brake horsepower-hour of nonmethane hydrocarbons and oxides of nitrogen and .01 grams per brake horsepower-hour of particulate matter; or

(ii) the emissions of nonmethane hydrocarbons, oxides of nitrogen, and particulate matter of the best performing technology of ultra-low sulfur diesel vehicles of the same class and application that are commercially available.

**SEC. 402. PILOT PROGRAM.**

(a) **ESTABLISHMENT.**—The Secretary shall establish a competitive grant pilot program, to be administered through the Clean Cities Program of the Department of Energy, to provide not more than 15 geographically dispersed project grants to State governments, local governments, or metropolitan transportation authorities to carry out a project or projects for the purposes described in subsection (b).

(b) **GRANT PURPOSES.**—Grants under this section may be used for the following purposes:

(1) The acquisition of alternative fueled vehicles or fuel cell vehicles, including—

(A) passenger vehicles including neighborhood electric vehicles; and

(B) motorized two-wheel bicycles, scooters, or other vehicles for use by law enforcement personnel or other State or local government or metropolitan transportation authority employees.

(2) The acquisition of alternative fueled vehicles, hybrid vehicles, or fuel cell vehicles, including—

(A) buses used for public transportation or transportation to and from schools;

(B) delivery vehicles for goods or services; and

(C) ground support vehicles at public airports, including vehicles to carry baggage or push airplanes away from terminal gates.

(3) The acquisition of ultra-low sulfur diesel vehicles.

(4) Infrastructure necessary to directly support an alternative fueled vehicle, fuel cell vehicle, or hybrid vehicle project funded by the grant, including fueling and other support equipment.

(5) Operation and maintenance of vehicles, infrastructure, and equipment acquired as part of a project funded by the grant.

(c) **APPLICATIONS.**—

(1) **REQUIREMENTS.**—The Secretary shall issue requirements for applying for grants under the pilot program. At a minimum, the Secretary shall require that applications be submitted by the head of a State or local government or a metropolitan transportation authority, or any combination thereof, and a registered participant in the Clean Cities Program of the Department of Energy, and shall include—

(A) at least one project to enable passengers or goods to be transferred directly from vehicles acquired under this section to a local, regional, or national transportation system;

(B) a description of the projects proposed in the application, including how they meet the requirements of this title;

(C) an estimate of the ridership or degree of use of the projects proposed in the application;

(D) an estimate of the air pollution emissions reduced and fossil fuel displaced as a result of the projects proposed in the application, and a plan to collect and disseminate environmental data, related to the projects to be funded under the grant, over the life of the projects;

(E) a description of how the projects proposed in the application will be sustainable without Federal assistance after the completion of the term of the grant;

(F) a complete description of the costs of each project proposed in the application, including acquisition, construction, operation, and maintenance costs over the expected life of the project;

(G) a description of which costs of the projects proposed in the application will be supported by Federal assistance under this title; and

(H) documentation to the satisfaction of the Secretary that diesel fuel containing sulfur at not more than 15 parts per million is available for car-

rying out the projects, and a commitment by the applicant to use such fuel in carrying out the projects.

(2) PARTNERS.—An applicant under paragraph (1) may carry out projects under the pilot program in partnership with public and private entities.

(d) SELECTION CRITERIA.—In evaluating applications under the pilot program, the Secretary shall consider each applicant's previous experience with similar projects and shall give priority consideration to applications that——

(1) are most likely to maximize protection of the environment;

(2) demonstrate the greatest commitment on the part of the applicant to ensure funding for the proposed projects and the greatest likelihood that each project proposed in the application will be maintained or expanded after Federal assistance under this title is completed; and

(3) exceed the minimum requirements of subsection (c)(1)(A).

(e) PILOT PROJECT REQUIREMENTS.—

(1) MAXIMUM AMOUNT.—The Secretary shall not provide more than \$20,000,000 in Federal assistance under the pilot program to any applicant.

(2) COST SHARING.—The Secretary shall not provide more than 50 percent of the cost, incurred during the period of the grant, of any project under the pilot program.

(3) MAXIMUM PERIOD OF GRANTS.—The Secretary shall not fund any applicant under the pilot program for more than 5 years.

(4) DEPLOYMENT AND DISTRIBUTION.—The Secretary shall seek to the maximum extent practicable to ensure a broad geographic distribution of project sites.

(5) TRANSFER OF INFORMATION AND KNOWLEDGE.—The Secretary shall establish mechanisms to ensure that the information and knowledge gained by participants in the pilot program are transferred among the pilot program participants and to other interested parties, including other applicants that submitted applications.

(f) SCHEDULE.—

(1) PUBLICATION.—Not later than 3 months after the date of the enactment of this Act, the Secretary shall publish in the Federal Register, Commerce Business Daily, and elsewhere as appropriate, a request for applications to undertake projects under the pilot program. Applications shall be due within 6 months of the publication of the notice.

(2) SELECTION.—Not later than 6 months after the date by which applications for grants are due, the Secretary shall select by competitive, peer review all applications for projects to be awarded a grant under the pilot program.

(g) LIMIT ON FUNDING.—The Secretary shall provide not less than 20 percent and not more than 25 percent of the grant funding made available under this section for the acquisition of ultra-low sulfur diesel vehicles.

#### SEC. 403. REPORTS TO CONGRESS.

(a) INITIAL REPORT.—Not later than 2 months after the date grants are awarded under this title, the Secretary shall transmit to the Congress a report containing——

(1) an identification of the grant recipients and a description of the projects to be funded;

(2) an identification of other applicants that submitted applications for the pilot program; and

(3) a description of the mechanisms used by the Secretary to ensure that the information and knowledge gained by participants in the pilot program are transferred among the pilot program participants and to other interested parties, including other applicants that submitted applications.

(b) EVALUATION.—Not later than 3 years after the date of the enactment of this Act, and annually thereafter until the pilot program ends, the Secretary shall transmit to the Congress a report containing an evaluation of the effectiveness of the pilot program, including an assessment of the benefits to the environment derived from the projects included in the pilot program as well as an estimate of the potential benefits to the environment to be derived from widespread application of alternative fueled vehicles and ultra-low sulfur diesel vehicles.

#### SEC. 404. AUTHORIZATION OF APPROPRIATIONS.

There are authorized to be appropriated to the Secretary \$200,000,000 to carry out this title, to remain available until expended.

## TITLE V—CLEAN COAL

### SEC. 501. AUTHORIZATION OF APPROPRIATIONS.

(a) **CLEAN COAL POWER INITIATIVE.**—Except as provided in subsection (b), there are authorized to be appropriated to the Secretary to carry out the activities authorized by this title \$200,000,000 for each of the fiscal years 2003 through 2011, to remain available until expended.

(b) **LIMIT ON USE OF FUNDS.**—Notwithstanding subsection (a), no funds may be used to carry out the activities authorized by this title after September 30, 2003, unless the Secretary has transmitted to the Committee on Energy and Commerce and the Committee on Science of the House of Representatives, and to the Senate, the report required by this subsection and one month has elapsed since that transmission. The report shall include, with respect to subsection (a), a 10-year plan containing—

(1) a detailed assessment of whether the aggregate funding levels provided under subsection (a) are the appropriate funding levels for that program;

(2) a detailed description of how proposals will be solicited and evaluated, including a list of all activities expected to be undertaken;

(3) a detailed list of technical milestones for each coal and related technology that will be pursued; and

(4) a detailed description of how the program will avoid problems enumerated in General Accounting Office reports on the Clean Coal Technology Program, including problems that have resulted in unspent funds and projects that failed either financially or scientifically.

(c) **APPLICABILITY.**—Subsection (b) shall not apply to any project begun before September 30, 2003.

### SEC. 502. PROJECT CRITERIA.

(a) **IN GENERAL.**—The Secretary shall not provide funding under this title for any project that does not advance efficiency, environmental performance, and cost competitiveness well beyond the level of technologies that are in operation or have been demonstrated as of the date of the enactment of this Act.

(b) **TECHNICAL CRITERIA FOR CLEAN COAL POWER INITIATIVE.**—

(1) **GASIFICATION.**—(A) In allocating the funds made available under section 501(a), the Secretary shall ensure that at least 80 percent of the funds are used only for projects on coal-based gasification technologies, including gasification combined cycle, gasification fuel cells, gasification coproduction, and hybrid gasification/combustion.

(B) The Secretary shall set technical milestones specifying emissions levels that coal gasification projects must be designed to and reasonably expected to achieve. The milestones shall get more restrictive through the life of the program. The milestones shall be designed to achieve by 2020 coal gasification projects able—

(i) to remove 99 percent of sulfur dioxide;

(ii) to emit no more than .05 lbs of NO<sub>x</sub> per million BTU;

(iii) to achieve substantial reductions in mercury emissions; and

(iv) to achieve a thermal efficiency of—

(I) 60 percent for coal of more than 9,000 Btu;

(II) 59 percent for coal of 7,000 to 9,000 Btu; and

(III) 57 percent for coal of less than 7,000 Btu.

(2) **OTHER PROJECTS.**—For projects not described in paragraph (1), the Secretary shall set technical milestones specifying emissions levels that the projects must be designed to and reasonably expected to achieve. The milestones shall get more restrictive through the life of the program. The milestones shall be designed to achieve by 2010 projects able—

(A) to remove 97 percent of sulfur dioxide;

(B) to emit no more than .08 lbs of NO<sub>x</sub> per million BTU;

(C) to achieve substantial reductions in mercury emissions; and

(D) to achieve a thermal efficiency of—

(i) 45 percent for coal of more than 9,000 Btu;

(ii) 44 percent for coal of 7,000 to 9,000 Btu; and

(iii) 42 percent for coal of less than 7,000 Btu.

(3) **CONSULTATION.**—Before setting the technical milestones under paragraphs (1)(B) and (2), the Secretary shall consult with the Administrator of the Environmental Protection Agency and interested entities, including coal producers, industries using coal, organizations to promote coal or advanced coal

technologies, environmental organizations, and organizations representing workers.

(4) EXISTING UNITS.—In the case of projects at existing units, in lieu of the thermal efficiency requirements set forth in paragraph (1)(B)(iv) and (2)(D), the projects shall be designed to achieve an overall thermal design efficiency improvement compared to the efficiency of the unit as operated, of not less than—

- (A) 7 percent for coal of more than 9,000 Btu;
- (B) 6 percent for coal of 7,000 to 9,000 Btu; or
- (C) 4 percent for coal of less than 7,000 Btu.

(5) PERMITTED USES.—In allocating funds made available under section 501, the Secretary may fund projects that include, as part of the project, the separation and capture of carbon dioxide.

(c) FINANCIAL CRITERIA.—The Secretary shall not provide a funding award under this title unless the recipient has documented to the satisfaction of the Secretary that—

- (1) the award recipient is financially viable without the receipt of additional Federal funding;
- (2) the recipient will provide sufficient information to the Secretary for the Secretary to ensure that the award funds are spent efficiently and effectively; and
- (3) a market exists for the technology being demonstrated or applied, as evidenced by statements of interest in writing from potential purchasers of the technology.

(d) FINANCIAL ASSISTANCE.—The Secretary shall provide financial assistance to projects that meet the requirements of subsections (a), (b), and (c) and are likely to—

- (1) achieve overall cost reductions in the utilization of coal to generate useful forms of energy;
- (2) improve the competitiveness of coal among various forms of energy in order to maintain a diversity of fuel choices in the United States to meet electricity generation requirements; and
- (3) demonstrate methods and equipment that are applicable to 25 percent of the electricity generating facilities that use coal as the primary feedstock as of the date of the enactment of this Act.

(e) FEDERAL SHARE.—The Federal share of the cost of a coal or related technology project funded by the Secretary shall not exceed 50 percent.

(f) APPLICABILITY.—No technology, or level of emission reduction, shall be treated as adequately demonstrated for purposes of section 111 of the Clean Air Act, achievable for purposes of section 169 of that Act, or achievable in practice for purposes of section 171 of that Act solely by reason of the use of such technology, or the achievement of such emission reduction, by one or more facilities receiving assistance under this title.

#### SEC. 503. REPORT.

Not later than 1 year after the date of the enactment of this Act, and once every 2 years thereafter through 2011, the Secretary, in consultation with other appropriate Federal agencies, shall transmit to the Committee on Energy and Commerce and the Committee on Science of the House of Representatives, and to the Senate, a report describing—

- (1) the technical milestones set forth in section 502 and how those milestones ensure progress toward meeting the requirements of subsections (b)(1)(B) and (b)(2) of section 502; and
- (2) the status of projects funded under this title.

#### SEC. 504. CLEAN COAL CENTERS OF EXCELLENCE.

As part of the program authorized in section 501, the Secretary shall award competitive, merit-based grants to universities for the establishment of Centers of Excellence for Energy Systems of the Future. The Secretary shall provide grants to universities that can show the greatest potential for advancing new clean coal technologies.

## SECTION-BY-SECTION ANALYSIS OF

**H.R. 238, Energy Research, Development, Demonstration,  
and Commercial Application Act of 2003**

**Summary:** The five titles of the Energy R&D Bill introduced at the start of the 108th Congress comprise the Science Committee's portions of H.R. 4 that were largely agreed to by the Energy Conferees in October 2002. The total R&D authorization is nearly \$33 billion, which represents significant but measured growth in research, development, demonstration and commercial application.

**Sec. 1. Short Title**

This Act may be cited as the "Energy Research, Development, Demonstration, and Commercial Application Act of 2003."

**TITLE I—RESEARCH AND DEVELOPMENT****Sec. 101. Purposes**

This section lists six purposes relating energy research to energy savings and production, national security, environmental impacts, and economic growth.

**Sec. 102. Goals**

This section describes quantitative goals for the various Department of Energy ("Department") programs in energy efficiency, distributed energy and electric energy systems, renewable energy, nuclear energy, and fossil energy. It provides for periodic reviews of the goals. In addition, it specifies that stated goals do not create or limit any authority for federal agencies or create any new requirements and cannot be used to support the establishment of regulatory standards or requirements.

**Sec. 103. Definitions**

This section defines various terms commonly used in the bill.

**Subtitle A—Energy Efficiency****PART 1—AUTHORIZATION OF APPROPRIATIONS****Sec. 104. Energy Efficiency**

This section authorizes \$3.51 billion for Energy Efficiency programs at the Department for fiscal years 2003–2007, including programs that are authorized in the Parts of this Subtitle that follow. Of this amount, \$210 million is for a Next Generation Lighting Initiative, \$26 million for a Secondary Electric Vehicle Battery Program and \$125 million for the Energy Efficiency Science Initiative. This section also provides an additional \$250 million authorization for fiscal years 2008 through 2012 for the Lighting Initiative and includes a subsection preventing the use of funds for developing energy efficiency regulations or for programs funded under other authorities.

**PART 2—LIGHTING SYSTEMS****Sec. 105. Next Generation Lighting Initiative**

This section requires the Secretary of Energy ("Secretary") to carry out a Next Generation Lighting Initiative to be jointly funded by industry and the Federal Government and largely carried out by a competitively selected industry consortium. The section specifies government and private sector roles.

**PART 3—BUILDINGS****Sec. 106. National Building Performance Initiative**

This section requires the Director of the Office of Science and Technology Policy to establish of an interagency group to develop a plan for a public-private program to improve building performance.

**PART 4—VEHICLES****Sec. 107. Definitions**

This section provides definitions for section 108, Establishment of Secondary Electric Battery Use Program.

**Sec. 108. Establishment of Secondary Electric Battery Use Program**

This section requires the Secretary to establish a research program to facilitate the reuse of batteries from electric vehicles for other purposes, such as bulk power and commercial power storage.

**Sec. 109. Advanced Vehicle Technology**

This section requires the Secretary to expand research into fuel cells, emission control systems, batteries and power electronics for hybrid vehicle technologies, combustion and after-treatment technologies, and other advanced fuels and materials that could improve vehicle fuel economy.

**PART 5—ENERGY EFFICIENCY SCIENCE INITIATIVE****Sec. 110. Energy Efficiency Science Initiative**

This section requires the Secretary to establish an energy efficiency research program run jointly by the Director of the Office of Science and the Assistant Secretary for Energy Efficiency and Renewable Energy.

**Subtitle B—Distributed Energy and Electric Energy Systems****PART 1—AUTHORIZATION OF APPROPRIATIONS****Sec. 111. Distributed Energy and Electric Energy Systems**

This section authorizes \$1.01 billion for the Distributed Energy and Electric Energy Systems programs for fiscal years 2003–2007, including programs that are authorized in the Parts of this Subtitle that follow.

**PART 2—DISTRIBUTED POWER****Sec. 112. Strategy**

This section requires the Secretary to ensure completion of a hybrid distributed power research strategy to be transmitted to Congress within one year.

**Sec. 113. High Power Density Industry Program**

This section requires the Secretary to establish a research program to improve the energy efficiency of facilities such as data centers and “server farms.”

**Sec. 114. Micro-Cogeneration Energy Technology**

This section requires the Secretary to make competitive merit-based grants to consortia for the development of residential combined heat and power technologies.

**PART 3—TRANSMISSION SYSTEMS****Sec. 115. Transmission Infrastructure Systems Research, Development, Demonstration, and Commercial Application**

This section requires the Secretary to develop and implement a research, development, demonstration and commercial application program to promote improved efficiency and reliability of electrical transmission systems.

**Subtitle C—Renewable Energy****PART 1—AUTHORIZATION OF APPROPRIATIONS****Sec. 121. Renewable Energy**

This section authorizes \$2.53 billion for the Renewable Energy Systems programs at the Department for fiscal years 2003–2007, including programs that are authorized in the Parts of this Subtitle that follow. Of this amount, \$756 million is authorized for Bioenergy.

**PART 2—BIOENERGY****Sec. 122. Bioenergy Programs**

This section requires that the Secretary conduct a research, development, demonstration, and commercial application program on biopower and biofuels.

**PART 3—HYDROGEN****Sec. 123. Short Title**

This section provides a short title to the hydrogen sections that follow.

**Sec. 124. Matsunaga Act Amendment**

This section amends the text of the “Matsunaga Hydrogen Research, Development and Demonstration of 1990 Act (42 U.S.C. 12401).” It contains new requirements for reports to Congress, including research plans, technology assessments, and recommendations for program improvements. The section also specifies areas of focus for hydrogen research, including the production, storage, and transportation of hydrogen. It authorizes the demonstration of critical hydrogen technologies and facilitates the transfer of technology to the private sector. The section establishes the Hydrogen Technical Advisory Committee to advise the Secretary on the implementation of the Act, and calls for the National Academy of Sciences to review the research conducted under the Act. The section also authorizes appropriations of \$300 million for fiscal years 2003–2007 out of funds authorized in Section 121.

**Sec. 125. Hydrogen Future Act Amendment**

This section amends title II of the “Hydrogen Future Act of 1996” (42 U.S.C. 12403) to authorize programs to demonstrate the use of fuel cells in Federal, State, and local government applications, including stationary and transportation applications. It establishes an interagency task force on hydrogen and authorizes \$135 million for fiscal years 2003–2007 out of funds authorized in Section 121.

**PART 4—MISCELLANEOUS PROJECTS****Sec. 126. Miscellaneous Projects**

This section requires the Secretary to establish programs of research, development, demonstration, and commercial application into ocean energy (including wave energy), hybrid wind-coal gasification energy technologies, combined use of renewable energy technologies and hydrogen carrier fuels.

**Subtitle D—Nuclear Energy****PART 1—AUTHORIZATION OF APPROPRIATIONS****Sec. 131. Nuclear Energy**

This section authorizes \$1.98 billion for fiscal years 2003–2007 for the nuclear energy research, development, demonstration, and commercial application programs, including programs that are authorized in the Parts of this Subtitle that follow. In fiscal years 2003–2007, it authorizes \$1.33 billion for core programs and \$650 million for infrastructure support programs. Within the amount authorized for core programs, \$533 million is authorized for advanced fuel recycling and \$190 million is authorized for university programs.

**PART 2—NUCLEAR ENERGY RESEARCH PROGRAMS****Sec. 132. Nuclear Energy Research Programs**

This section authorizes five nuclear energy research programs at the Department: the Nuclear Energy Research Initiative, the Nuclear Energy Plant Optimization Program, the Nuclear Power 2010 Program, the Generation IV Nuclear Energy Systems Initiative and research on Reactor Production of Hydrogen. It also authorizes Infrastructure Support.

**PART 3—ADVANCED FUEL RECYCLING****Sec. 133. Advanced Fuel Recycling Program**

This section authorizes a nuclear fuel recycling technology R&D program on proliferation-resistant and passively safe technologies. This research will focus on technologies that also minimize health and environmental impacts.

**PART 4—UNIVERSITY PROGRAMS****Sec. 134. University Nuclear Science and Engineering Support**

This section authorizes new and existing programs to promote university research and education in nuclear engineering.

**Subtitle E—Fossil Energy****PART 1—AUTHORIZATION OF APPROPRIATIONS**

**Sec. 141. Fossil Energy**

This section authorizes \$2.71 billion for fiscal years 2003–2007 to carry out the fossil energy, research, development, demonstration, and commercial application programs of the Department, including programs that are authorized in the Parts of this Subtitle that follow. Of this amount, this section authorizes \$140 million for proton exchange membrane fuel cells, \$27 million for coal mining technologies and \$125 million for Office of Arctic Energy programs. This section also authorizes \$100 million in fiscal years 2008–2012 for Office of Arctic Energy programs. This section also authorizes funding for the ultra-deepwater and unconventional resources programs, with the funds coming from 7.5 percent of the royalties, rents, and bonuses derived from federal onshore and offshore oil and gas leases, with priority given to prior distributions required by law; such funding would be subject to appropriations Acts.

**PART 2—RESEARCH PROGRAMS****Sec. 142. Fossil Energy Research Programs**

This section requires the Secretary to conduct a program of fossil energy research, development, demonstration and commercial application, including research on coal, oil, natural gas, and fuel cells. It also includes a subsection requiring a report on natural gas and oil deposits off of the Louisiana and Texas coasts every 2 years.

**Sec. 143. Research and Development for Coal Mining Technologies**

This section requires the Secretary to establish a program of research, development, demonstration and commercial application with industry and universities to develop new mining technologies.

**PART 3—ULTRA-DEEPWATER AND UNCONVENTIONAL NATURAL GAS AND OTHER PETROLEUM RESOURCES****Sec. 144. Program Authority**

This section requires the Secretary to conduct programs of research, development, demonstration and commercial application on ultra-deepwater and unconventional natural gas and other petroleum resource exploration, production and environmental mitigation. It also limits the programs to work in areas currently eligible to be leased for exploration and requires consultation with the Secretary of the Interior.

**Sec. 145. Ultra-Deepwater Program**

This section describes how the ultra-deepwater program should be carried-out, assigning responsibilities to the Secretary and a private consortium selected by the Secretary to help manage the program. It also establishes procedures to address conflicts of interest.

**Sec. 146. Unconventional Natural Gas And Other Petroleum Resources Program**

This section requires the Secretary to establish a separate research, development, demonstration and commercial application program for onshore unconventional oil and gas exploration for resources in economically inaccessible geographical areas.

**Sec. 147. Additional Requirements for Awards**

This section places requirements on applicants to the Ultra-deepwater program to describe the intended commercial use of any technology to be demonstrated under the Act, and provides flexibility concerning the location of demonstration projects in deepwater depths of less than 1,500 meters and cost sharing for independent producers.

**Sec. 148. Advisory Committees**

This section requires the Secretary to establish two separate advisory committees for ultra-deepwater and unconventional resource programs and specifies their duties and compensation levels for their members.

**Sec. 149. Limits on Participation**

This section provides for limits on the entities entitled to participate in the program.

**Sec. 150. Fund**

This section establishes in the Treasury an Ultra-Deepwater and Unconventional Natural Gas and Other Petroleum Resources Fund.

**Sec. 151. Sunset**

The section terminates the ultra-deepwater and unconventional research programs on September 30, 2010.

**Sec. 152. Definitions**

This section provides seven definitions for terms used in this Part.

**Subtitle F—Science****PART 1—AUTHORIZATION OF APPROPRIATIONS****Sec. 161. Science**

This section authorizes \$20.9 billion for fiscal years 2003–2007 to carry out the research, development, demonstration, and commercial application programs of the Office of Science, including programs that are authorized in the Parts of this Subtitle that follow. From this amount, the section authorizes \$1.72 billion for Fusion Energy Science, \$559 million for the Spallation Neutron Source, \$1.335 billion for nanoscale science and \$1.215 billion for Advanced Scientific Computing.

**PART 2—FUSION ENERGY SCIENCES****Sec. 162. Plan for Fusion Experiment**

This section requires the Secretary to develop a plan for a magnetic fusion burning plasma experiment within the United States. It also authorizes the U.S. to conduct any research and development necessary to develop such plans.

**Sec. 163. Plan for Fusion Energy Sciences Program**

This section requires the Secretary to develop a program and submit a plan to Congress to provide a strong scientific base for Fusion Energy Sciences and the experiments described in Sec. 162.

**PART 3—SPALLATION NEUTRON SOURCE****Sec. 164. Definition**

This section provides a definition for “Spallation Neutron Source.”

**Sec. 165. Report**

This section requires the Secretary to report on the Spallation Neutron Source as part of its annual budget submission.

**Sec. 166. Limitations**

This section provides limitations for the amounts obligated for Spallation Neutron Source.

**PART 4—MISCELLANEOUS****Sec. 167. Facility and Infrastructure Support for Non-Military Energy Laboratories**

This section requires the Secretary to develop and implement a policy for maintaining, modifying or closing facilities and infrastructure at nonmilitary energy laboratories. The policy must be communicated in a report transmitted to Congress by 2005.

**Sec. 168. Research Regarding Precious Metal Catalysis**

This section authorizes research on the use of precious metals in catalysis.

**Sec. 169. Nanoscale Science and Engineering Research**

This section requires the Secretary to support a program of research and development in nanoscale science and engineering within the Office of Science. The section authorizes grants for research centers and major instrumentation.

**Sec. 170. Advanced Scientific Computing for Energy Missions**

This section requires the Secretary to support a program to advance high performance computing and requires a report to Congress before the Department can undertake an initiative on new computer architecture. It also amends the definitions and the general responsibilities of the Department of Energy in the High-Performance Computing Act of 1991 (P.L. 108–3 Title 15, Chapter 81).

## Subtitle G—Energy and Environment

### Sec. 171. Authorization of Appropriations

The section authorizes appropriations of \$28.5 million for fiscal years 2003–2007 to carry out several energy and environmental research projects, including programs that are authorized in the Parts of this Subtitle that follow. From this amount, the section authorizes \$28 million for U.S.–Mexico Energy Technology, and \$500,000 for waste carpet incineration studies.

### Sec. 172. United States-Mexico Energy Technology Cooperation

This section requires the Secretary to establish a collaborative research, development, demonstration, and commercial application program to promote efficient, environmentally sound development along the U.S.–Mexico border.

### Sec. 173. Waste Reduction and Use of Alternatives

This section authorizes the Secretary to make a single university grant to examine and develop the feasibility of burning post-consumer carpet in cement kilns as an alternative energy source.

### Sec. 174. Coal Gasification

This section authorizes loan guarantees for an energy project using integrated gasification combined cycle technology.

### Sec. 175. Petroleum Coke Gasification

This section authorizes loan guarantees for at least one petroleum coke gasification project.

### Sec. 176. Other Biopower and Bioenergy

This section requires the Secretary to assist in the planning, design and implementation of several identified projects to produce biopower and biofuels.

### Sec. 177. Technology Transfer

This section authorizes a competitively awarded contract for the transfer of technologies relating to ultra-deepwater research and development.

### Sec. 178. Coal Technology Loans

This section authorizes \$125 million to provide a loan for an experimental plant constructed under a Department of Energy cooperative agreement.

## Subtitle H—Management

### Sec. 181. Availability of Funds

This section provides that funds appropriated to the Department under this title shall remain available until expended.

### Sec. 182. Cost Sharing

This section requires minimum non-federal contributions of 20 percent of the cost of research and development, and 50 percent for demonstration and commercial application projects. It allows the Secretary to reduce these requirements.

### Sec. 183. Merit Review of Proposals

This section requires an impartial review of the scientific and technical merit of project proposals.

### Sec. 184. External Technical Review of Departmental Programs

This section requires the Secretary to establish new or designate existing advisory committees to review research, development, demonstration and commercial application programs. It also requires the Secretary to contract with the National Academy of Sciences for periodic review and assessment of programs.

### Sec. 185. Improved Coordination of Technology Transfer Activities

This section requires the Secretary to establish a Technology Transfer Coordinator for the Department, and a Technology Transfer Working Group comprising representatives from all the National Laboratories and single-purpose research facilities.

### Sec. 186. Technology Infrastructure Program

This section requires the Secretary to establish a “technology clusters” program to expand National Laboratory capabilities in areas where external expertise from

companies and universities is needed. It also authorizes \$10 million for each of fiscal years 2003 and 2004.

**Sec. 187. Small Business Advocacy and Assistance**

This section requires National Laboratories and facilities to establish an outreach program for small and minority businesses.

**Sec. 188. Mobility of Scientific and Technical Personnel**

This section requires the Secretary to report to Congress on any impediments to sharing staff among National laboratories and single- purpose facilities.

**Sec. 189. National Academy of Sciences Report**

This section requires the National Academy of Sciences to study the impediments to decreasing the cycle time in discovering, developing and deploying new energy technology innovations.

**Sec. 190. Outreach**

This section requires the Secretary to ensure that each program authorized by this title includes an outreach component.

**Sec. 191. Limits On Use of Funds**

This section prohibits award of management and operations (M&O) contracts for federal non-military energy laboratories unless they are made on a competitive basis or the Secretary provides a waiver and Congress is notified two months in advance.

**Sec. 192. Reprogramming**

This section requires the Secretary to issue a report 60 days after appropriations are enacted of how appropriated funds will be distributed under this authorization. It also requires 30-day congressional review for any reprogramming that exceeds 5 percent of any individual distribution.

**Sec. 193. Construction With Other Laws**

This section lists other laws that grant relevant authority to the Secretary.

## TITLE II—DEPARTMENT OF ENERGY MANAGEMENT

**Sec. 201. Improved Coordination and Management of Civilian Science and Technology Programs**

This section amends the Department of Energy Organization Act (“DOEOA”) to require that the position of Director of the Office of Science established at section 209(a) of the DOEOA be elevated to an Assistant Secretary. The section also increases the overall number of Assistant Secretaries in the Department at section 203(a) of the DOEOA from six to seven, and expresses the Sense of Congress that leadership for departmental missions in nuclear energy should be at the Assistant Secretary level.

## TITLE III—CLEAN SCHOOL BUSES

**Sec. 301. Establishment of Pilot Program**

This section requires the Secretary to establish a program to demonstrate the use by local school districts of clean school buses. Not less than 20 percent or more than 25 percent of funding under the section shall be for the demonstration of ultra-low sulfur diesel school buses.

**Sec. 302. Fuel Cell Bus Development and Demonstration Program**

This section requires the Secretary to establish a program to enter into cooperative agreements for the development and demonstration of fuel cell-powered buses. Cost sharing under this provision is specified with regard to infrastructure and demonstration activities.

**Sec. 303. Authorization of Appropriations**

This section authorizes a total of \$300 million for the Title III program through fiscal year 2006.

## TITLE IV—ALTERNATIVE FUELED AND ADVANCED VEHICLES.

### **Sec. 401. Definitions**

This provision amends the Energy Policy Act of 1992 (42 U.S.C. 14 13211) to provide definitions for alternative fueled vehicle, fuel cell, hybrid, neighborhood electric, and ultra-low sulfur diesel vehicles. It also defines the pilot program.

### **Sec. 402. Pilot Program**

This section requires the Secretary to establish a competitive grant program to provide not more than 15 geographically dispersed demonstration projects for state and local governments or metropolitan transportation authorities. Grants can be utilized for the demonstration of alternative fueled vehicles, fuel cell vehicles, hybrid vehicles, ultra-low sulfur vehicles and infrastructure associated with alternative fueled, fuel cell and hybrid vehicle projects. The section imposes several additional requirements on grants and imposes selection criteria that give priority consideration to projects which maximize protection of the environment, demonstrate that projects will be maintained or expanded after initial federal funding, and enable the transfer of goods or passengers to other transportation systems. Grants under the demonstration program are subject to 50 percent cost sharing requirements and a maximum period of 5 years. The Secretary is also required to seek broad geographic distribution of projects and to transfer information and knowledge gained through projects to other interested parties.

### **Sec. 403. Reports to Congress**

This section requires the Secretary to issue a report to Congress on grants as well as evaluations of the effectiveness of the program.

### **Sec. 404. Authorization of Appropriations**

This section authorizes \$200 million to carry out Title IV, to remain available until expended.

## TITLE V—CLEAN COAL

### **Sec. 501. Authorization of Appropriations**

This section authorizes \$200 million for a Clean Coal Power Initiative at the Department for fiscal years 2003–2011. Section 501 also requires that the Secretary transmit a report to Congress regarding certain implementation activities. Certain funding restrictions apply if the Secretary fails to transmit the report to Congress in accordance with the terms of section 501 by September 30, 2003.

### **Sec. 502. Project Criteria**

This section establishes technical criteria that are to be required for projects funded under the Clean Coal Power Initiative. It also requires that the Secretary, in consultation with certain parties, set technical milestones specifying the emissions levels that projects must be designed to and reasonably expected to achieve. Section 502 also establishes financial assistance criteria applicable to projects, and limits the federal share of a project to not more than 50 percent of the cost of a project. Additionally, section 502 provides for environmental criteria by clarifying the manner in which technology used at, or emissions reduction levels achieved by, facilities receiving assistance under Title V are treated under sections 111, 169, and 171 of the Clean Air Act.

### **Sec. 503. Report**

This section requires the Secretary, in consultation with other appropriate agencies, to transmit a report to Congress on the technical milestones and the status of projects funded under Title V no later than one year after the date of the enactment of the title, and once every two years thereafter through 2011.

### **Sec. 504. Clean Coal Centers of Excellence**

This section requires the Secretary to award competitive, merit-based grants to universities for the establishment of Centers of Excellence for Energy Systems of the Future. It also requires that the Secretary provide grants to universities that can show the greatest potential for advancing new clean coal technologies.

Chairman BOEHLERT. I ask Members to proceed with the amendments in the order of the roster, but at this time, the Distinguished Ranking Member from Texas, Mr. Hall. Mr. Hall, as you gather your chair and collect your wits, we are eagerly awaiting your eloquent prose. The gentleman from Texas is recognized for such time as he may consume.

Mr. HALL. It looked like you would at least give me the time to read it first.

It says here, first of all, Mr. Chairman, I want to thank you for the high degree of cooperation and courtesies you and your staff have extended to me as we prepare for this markup here today. You were a little conservative, I thought, in your introduction. [Laughter.] Okay. Are you ready to go to work now? Let us go.

All right. Once again, we are back on energy legislation, and no question with what—we need an energy bill. We need it in the worst way, and we need one as soon as we can get it on the President's desk. And the good thing about a good, sensible energy bill, I am not sure that the Chairman will like it as much as I like the fact that we've got a President that will sign it if it has all of the good things in it like drilling off the coast, and drilling the depths of the ocean, and no money in there for saving the whales.

Chairman BOEHLERT. We are going to try to guide Administration policy.

Mr. HALL. Seriously, we need to begin the steps necessary to ensure that our domestic supply is as secure as we can make it. And I would ask unanimous consent to put the rest of my speech into the record and yield to the Chairman and the Ranking Member of this committee, Mr. Nick—what the hell is Nick's last name?

[The prepared statement of Mr. Hall follows:]

PREPARED STATEMENT OF REPRESENTATIVE RALPH M. HALL

Mr. Chairman and Members of the Committee:

First of all, Mr. Chairman, I want to thank you for the high degree of cooperation and the courtesies you and your staff have extended to us as we prepared for this markup today. One of the reasons that the Science Committee produces such high quality legislation is the cooperative spirit that exists among the members and staff day-in and day-out and it shows up in the work product.

Once again we are back on energy legislation. This nation needs an energy bill now—and we need one as soon as we can put it on the President's desk.

We need to begin to take the steps necessary to ensure that our domestic supply is as secure as we can make it. Much of the crude oil and refined petroleum products we are using today comes from unstable areas of the world. We are at war in the Middle East and no one can predict whether oil will continue to flow from that area. A significant supply disruption will be devastating to this country and much of the rest of the world.

That is an unacceptable risk for this nation to take, especially when we have more choices on how we are going to meet our energy needs than any other developed nation. Other nations are envious of the options we have before us—abundant coal, oil and gas, nuclear, wind, solar, geothermal, falling water—all are there for us to use.

A strong energy R&D program is the key to ensuring that this nation not only survives but also prospers in the perilous times ahead.

The legislation before us today and the amendments that will be offered to it provide the underpinnings of a strong R&D program. Some of that work was done last year in the conference between the House and Senate on H.R. 4. Much of that work has been incorporated into this bill. Our members will recognize their handiwork in those provisions.

Among the major new elements are revised hydrogen provisions to reflect the President's commitment to a strong hydrogen production, infrastructure and vehicle

technology development program; and new fusion provisions that recognize the Administration's commitment to resume participation in the ITER project.

The question of whether the Department of Energy should regulate itself on occupational and nuclear safety matters has been debated for years. There is considerable sentiment that DOE ought to begin the process of turning jurisdiction in the laboratories under the Office of Science over to the OSHA and NRC. I believe this issue is ripe for discussion, and we begin that public process today.

With that, Mr. Chairman, I yield whatever time I have to the Ranking Democratic Member of the Energy Subcommittee, Mr. Lampson, for any comments he may have.

Mr. SMITH of Michigan. Lampson. Thank you, Ranking Member Hall and Chairman Boehlert. I do want to take just a moment to thank the Committee for including my two amendments in the en bloc amendment today. Good.

Well, the first of those two amendments would require the Department of Energy to complete a report that would lay out the design and cost of—next generation fuel cells and of an institution of higher education. And my second amendment requires the DOE to report back on efforts to increase collaboration between large and small institutions of higher education. And I am sure that I am not the only one that—on this committee who represents a smaller university that has so much to offer the Department of Energy through grants, contracts, and cooperative agreements. And I believe the DOE can do more to foster this—these types of collaborations.

So I thank you again, Chairman Boehlert and Ranking Member Hall, for working with me on these amendments, and I yield back.  
[The prepared statement of Mr. Smith of Michigan follows:]

#### PREPARED STATEMENT OF REPRESENTATIVE NICK SMITH

I want to thank Chairman Boehlert and Ranking Minority Member Hall for holding this hearing to markup H.R. 238, the Energy Research, Development, Demonstration, and Commercial Application Act of 2003.

I am pleased that the Administration has made energy policy a top priority. Our growing dependence on foreign oil presents serious challenges to our national security. As a member of the President's "Oil Policy Commission" in the 1970s we were concerned that this country was then depending on imported oil for 40 percent of our petroleum energy. Today it is much worse with imported petroleum accounting for nearly 60 percent of total use. Access to affordable energy is a vital component for fostering economic growth. Considering the situation in Iraq and the sluggishness of the economy, the need to conserve and develop new sources of energy has never been greater.

The nuclear subtitle in this bill authorizes \$1.7 billion for fiscal years 2004–2007 to fund a variety of research and development programs. Nuclear energy currently supplies about 20 percent of our nation's electricity and it holds great promise for future expansion. Nuclear power is clean, efficient, and it can be produced at a relatively low-cost when compared to fossil fuel powered plants. This legislation will help to develop new technologies that will allow us to improve existing nuclear plants and possibly even build state of the art new plants.

The Clean Coal Power Initiative is also very important. Coal is extremely abundant in America, and we would be foolish not to give priority to research to take advantage of that resource. Currently, coal power plants account for more than half of domestic electricity production and 65 percent in my home state of Michigan. This bill authorizes competitive grants to be issued to universities to develop new, cleaner, more efficient ways to utilize coal as a source of energy.

In addition to increasing energy production, this legislation looks at ways that we can conserve energy consumption. My amendment, included in the en bloc will fund plant genomics research to develop crop varieties that will reduce or eliminate the need for nitrogen-based fertilizer. This is an important energy issue because the production of nitrogen fertilizer consumes about five percent of domestic natural gas resources. The environment and farm economy will also benefit significantly from these future advances.

This bill also contains provisions to develop innovative bio-products that will offer viable alternatives to existing petroleum-based materials and goods. From biological resources we can derive products as diverse as fuels and lubricants, plastics, heat and electricity, chemicals, food, feed, building materials, paper, clothing, and much more. The potential of these bio-based technologies to use renewable resources as long-term alternatives to today's energy intensive industrial processes cannot be underestimated.

Chairman BOEHLERT. Thank you very much. Now let us proceed with the amendments in the—well, relatively in the order on the listing. There will be a slight adjustment, but first up is Mr. Miller of North Carolina.

Mr. MILLER. Thank you, Mr. Chairman. I am—I have the amendment at the desk.

Chairman BOEHLERT. Local report.

The CLERK. Amendment to H.R. 238 offered by Mr. Miller of North Carolina.

Mr. MILLER. Mr. Chairman, I ask unanimous consent that the amendment be considered as read.

Chairman BOEHLERT. Without objection, so ordered.

[The amendment appears on pages 214–216.]

Chairman BOEHLERT. The gentleman is recognized for five minutes.

Mr. MILLER. Thank you, Mr. Chairman. I want to thank, first the Democratic staff for developing this proposal and also the Chairman and the majority staff for working on it and streamlining the original proposal. I believe this is one of the amendments that the Chair referred to as one that he would not feel constrained to oppose, depending on how it was explained, so if I don't explain it, Mr. Chairman, to your liking the first time around, I will try a second.

This is aimed at trying to encourage a commercialization of conservation technology. Formerly, the leader in helping industry adapt conservation technology was actually the power companies because of the way that they are regulated. Many—in many parts of the country, however, the power industry is being deregulated, so the only real regulation is that of the marketplace, and in most market—free market economic theories, there is very little incentive for sellers to help reduce the demand for their product. So power companies are getting out of the business of helping reduce energy use to help encourage conservation.

This would try to replace that effort by the power companies with a grant program to establish ten technology transfer centers. First is to help the commercialization of technology research, largely done by the DOE to try to find the logical users of the technology and to adapt it to the industries that would most benefit from it. Second, it would help industry. Mine—my state is second in the Nation in manufacturing job loss. Industry in North Carolina, as in the rest of the country, is in a desperately competitive situation in the world market, and cost is enemy, including energy cost. If this will help industry reduce energy costs, it will help protect American jobs.

And third, it would encourage energy conservation. Again, the way it is done is to establish these pilot projects, ten centers, largely in partnership with, probably, nonprofit groups, universities,

local government to adapt the new technology that is being developed by the Department of Energy and elsewhere. Thank you, Mr. Chairman.

Chairman BOEHLERT. Thank you, Mr. Miller. That is a classic example of the eloquence that is so convincing. The Chair is pleased to accept your amendment. Now I do want to complement you and the minority for working cooperatively with the majority. It is a good idea. We worked it out, and we are glad to accept it.

Mr. MILLER. Thank you, Mr. Chairman.

Chairman BOEHLERT. Without objection—

Mr. HALL. Mr. Chairman, no, we have no objection. We like the amendment, and we thank you for accepting it. From a serious vein, one of our better Members of this committee, Lincoln Davis, has asked me to put into the record that—he normally attends, and he is very good, as you know, about attending Committee meetings and being on the Floor. He has a death in his family, and that is the reason he is not here today. He wanted that put of record. And I present—

Chairman BOEHLERT. Thank you. The record will note that, and please convey our condolences to Mr. Davis.

Mr. HALL. Thank you, Chairman.

Chairman BOEHLERT. 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. Thank you, Mr. Miller.

Next up on the docket is Mr. Matheson.

Mr. MATHESON. Thank you, Mr. Chairman. I—Mr. Chairman, I ask unanimous consent that the text of my amendment be included in the en bloc amendment.

Chairman BOEHLERT. Thank you very much. Without objection, so ordered.

[The prepared statement of Mr. Matheson follows:]

PREPARED STATEMENT OF REPRESENTATIVE JIM MATHESON

Mr. Chairman, thank you for accepting my amendment and for including it in the en bloc. This amendment is simple—it directs the Energy Secretary to undertake a demonstration project and field test of distributed generation systems that focuses on communications and control challenges.

This test needs to be conducted in both rural and urban areas, as each area has unique challenges. The resulting data will be used to identify future research priorities for the Department of Energy and to identify as yet unknown challenges in deployment of distributed energy systems over the next ten years.

The President's Council of Advisors for Science and Technology explicitly endorsed this demonstration project in its draft report of last October (no final report has been made available). As the Council stated, "the field of communications and controls for distributed energy systems is new and evolving rapidly. . . (demonstration and field tests are needed to help define better the functional specifications and the full range of communications and control system needs."

Distributed generation has the potential to be especially beneficial for rural customers and those who are in electric cooperatives. I worked with the National Rural Electric Cooperatives Association on this amendment, which it supports, and I am pleased that my colleagues are able to support this important research. Thank you, Chairman Boehlert and Ranking Member Hall for your continued leadership.

[The amendment appears on page 217.]

Chairman BOEHLERT. That is the spirit of cooperation we have been talking about, and we will move right along. Next up, Mr. Udall of Colorado. We will note—then let us mark as not here, so

we will go next—where are we then? The distinguished gentleman from Illinois, Mr. Costello.

Mr. COSTELLO. Mr. Chairman, I thank you in trying to meet your request to make this concise and to get your approval of this amendment, I offer this amendment with my friend and colleague, Mr. Calvert.

This amendment provides for the external regulation to civilian science labs operated by the Department of Energy. DOE is the only federal agency that self-regulates its worker safety and nuclear safety. DOE has had a terrible track record, as documented through Subcommittee hearings of this committee as well as the Inspector General and the GAO reports that have been submitted to Congress. No one disputes that the labs would be safer under external regulation. The GAO, various committees of the Congress, including the Appropriations Committee, even the lab managers all agree that external regulation would be best for worker safety and nuclear safety.

Mr. Chairman, the GAO has stated that external regulation not only would result in safer labs but also would save millions of dollars every year. And Mr. Chairman, external regulation at the DOE civilian labs is way overdue. Let us adopt this amendment, save taxpayers' money, and improve safety of the labs and their workers. And with that, Mr. Chairman, I would yield the balance of my time to my friend, Mr. Calvert.

[The prepared statement of Mr. Costello follows:]

PREPARED STATEMENT OF REPRESENTATIVE JERRY F. COSTELLO

Mr. Chairman, today I am introducing an amendment with Mr. Calvert that provides for the external regulation of nuclear safety and occupational safety and health at the Department of Energy civilian labs. This amendment, which draws from legislation Mr. Roemer, Mr. Calvert, Mr. Bliley, and I have introduced in the past, would push the Department of Energy to take steps that virtually everyone agrees is overdue: get the Department of Energy out of the business of regulating itself in the areas of nuclear and worker safety.

Discussion of external regulation at the labs is an old idea. It received an official boost in 1993 when then Secretary of Energy Hazel O'Leary announced that she would seek to implement external regulation of worker safety. Then, in 1994, legislation was introduced forcing DOE to stop self-regulating their nuclear facilities. DOE responded to these legislative initiatives by launching advisory groups to lay out a path to external regulation. In 1996, DOE established a Working Group on External Regulation which concluded that adopting this policy would improve safety, eliminate the inherent conflict of interest contained in self-regulation and gain credibility and public trust. That same year, DOE boldly adopted a 10-year plan to implement external regulation at its non-military energy laboratories. Let me say, through this amendment we intend to get them there on time.

For many outside the Department, this 10-year plan appeared too cautious. However, to those in the Department, it appeared too ambitious. In 1997, then Secretary Pena decided to take a step away from that commitment and run a two-year pilot program for further study. Despite this successful pilot program, which led the lab contractors, the GAO, the NRC and OSHA to all endorse external regulation, then Secretary Richardson, decided that external regulation would be unworkable.

In 1999, when the pilot study was completed, then Energy Subcommittee Chairman Calvert held an in-depth hearing on this issue. I was the ranking member of the Energy Subcommittee and I came away convinced that while there were some questions about implementation, the overwhelming evidence was that external regulation would provide more safety to workers and communities near labs while allowing the labs themselves to focus more on science and technology.

It is for this reason that laboratory managers also favor external regulation. They believe external regulation would free up overhead costs involved in self-regulation

and allow them to redirect resources towards doing more science. DOE contractors have to support 30 percent more staff to comply with DOE's orders. Battelle, which manages three energy labs, reports that it spends one-half to one-third less at its externally regulated private sector labs. Why should we burden our civilian energy labs with this unnecessary regulatory tax when it buys us nothing extra in terms of safety and health? Further, DOE is an inconsistent regulator with changes in standards, reporting requirements, and interventions. Paying more and getting less is not a good deal for anyone.

The NRC and OSHA are both professional regulatory bodies that provide a clearer regulatory regime with significant cost savings to those subject to their regulatory guidance.

Recently, the House Energy and Water Appropriations Subcommittee has taken a leading role in pushing the Department towards external regulation. Yet, the Department continues to resist external regulation. After ten years of studying this issue, we already know that external regulation is the right answer; yet, DOE insists that more time is needed.

Many have concerns about the costs of implementing external regulation. Despite 10 years of study, DOE claims they still cannot say what it would cost. It is true there are some uncertainties due to questions about how DOE, OSHA, and the NRC would implement an external regulation policy. This Committee can reduce those uncertainties and shape the implementation of external regulation by adopting this amendment and following up with aggressive and continuing oversight. Mr. Calvert and I are firmly committed to working with the Chairman, Appropriators, labs, OSHA, NRC, and the Department to insure that this reform is a true reform.

There is consensus everywhere outside of DOE that the labs should be subject to external regulation. GAO holds that position. The labs hold that position. The potential regulators hold that position. I believe this Committee and this Congress have a responsibility to the workers, the communities near the labs, and the taxpayers to see this overdue reform happen sooner rather than later. This amendment is intended as another signal to DOE that foot-dragging and endless studies will not satisfy this Committee or this Congress.

Thank you Mr. Chairman.

Chairman BOEHLERT. Mr. Calvert is recognized as a co-author of this amendment.

Mr. CALVERT. I am grateful for the kind words from my friend from Illinois. We have worked together on external regulations for some time, and I appreciate his efforts to keep us focused on the goal of bringing real reform on our non-military science labs.

Four years ago, I had the pleasure to chair a very educational meeting on external regulation of the non-military space labs—or science labs. The Department had just finished its initial pilot program, as Mr. Costello reminded us. We had a DOE witness and Assistant Secretary who patiently explained to us why, despite studying the issue for more than five years, the Department could not endorse external regulation when every other group that had looked at it said it was the right thing to do. The Department's logic boiled down to this: the Department could not endorse external regulation until the costs were certain. But the costs would remain uncertain until external regulation was actually implemented; therefore external regulation should never be implemented, because the costs were uncertain.

I suspect that the work done in the science labs exhibits a higher level of reasoning than the circular logic offered up by headquarters back in 1999. In fact, I know the labs have made many, many breakthroughs in intervening years, but headquarters continues to cling to the same mantra in postponing this common sense reform.

In the July 1999 hearing, Mr. Chairman, I know that we put a man on the moon in seven years, we defeated Hitler's Germany, Mussolini's Italy, Japan in four years, kicked Hussein out of Ku-

wait in a matter of months. We can accomplish all of that, but the Department could not move to external regulation in any reasonable time frame. This mindset tells you a lot about the Department and suggests why this amendment is necessary, and I am happy to support my friend from Illinois. We ought to move this amendment. Thank you, Mr. Chairman.

Chairman BOEHLERT. And the Chair is happy to support his friends from Illinois and California on a bipartisan basis. I would include in the record at this juncture a letter received from the Department of Energy.

[The information follows:]



**The Secretary of Energy**  
Washington, DC 20585

April 2, 2003

The Honorable Sherwood L. Boehlert  
Chairman  
Committee on Science  
2320 Rayburn House Office Building  
United States House of Representatives  
Washington, D.C. 20515

Dear Mr. Chairman:

The Department of Energy opposes the Costello amendment to H.R. 238 that would make the Department's non-military laboratories subject to external regulation by the Nuclear Regulatory Commission (NRC) on nuclear safety matters and by the Occupational Safety and Health Administration (OSHA) on worker protection matters. DOE's laboratories have excellent overall records concerning nuclear safety and worker protection, so we do not believe that regulation by NRC and OSHA is needed for that reason. Moreover, external regulation presents significant potential for interference with important Departmental missions.

The Costello amendment would authorize and direct regulation by NRC and OSHA of DOE's non-military laboratories. Characterization of a laboratory as military or non-military, however, does not capture the reality of the scope of activities undertaken by that laboratory as part of the Departmental complex and as a national scientific resource. Much very important national security work is accomplished at laboratories that are not part of the National Nuclear Security Administration (NNSA). This work may be funded by NNSA, by other elements of the U.S. Government, or by private organizations or international organizations such as the International Atomic Energy Agency (IAEA). Looking at only NNSA-funded work -- that is to say, excluding work for the Defense Department and other non-DOE national security directed departments and agencies -- in FY 2002 the non-NNSA managed laboratories engaged in over \$300 million of NNSA-funded activity, including \$28.9 million at Argonne, \$51.5 million at Brookhaven, \$62.1 million at INEEL, \$130.2 million at Oak Ridge, and \$164.6 million at the Pacific Northwest National Laboratory (PNNL). To give an example of just one project: PNNL, a non-military laboratory, used the NNSA funds to analyze the source and effect of what is being called a "Radiation Dispersal Release," the so called "dirty bomb." PNNL was selected for this research because it has equipment and scientists with expertise in the

environmental effects of radiation on the environment, and recently had been involved in related research. Several non-military laboratories also have been involved in training IAEA inspectors. The Congress also sought, when it enacted the Homeland Security Act, to ensure that the new Department of Homeland Security (DHS) would have access to all the DOE laboratories on the same terms as DOE in order to assist DHS in the performance of its mission. Both Departments have been working diligently to accomplish this objective. In short, all DOE laboratories perform important national security work. At this time of heightened national security concerns, it would be ill-advised to experiment with a transition to external regulation that at the very least would divert valuable resources to deal with the anticipated and unanticipated problems that would inevitably occur during and after the transition

Additionally, in the National Defense Authorization Act for Fiscal Year 2003 (FY03 DOD Authorization Act), Congress directed DOE to adopt regulations on worker protection that maintain the existing level of protection. Congress also authorized DOE to assess civil penalties against a contractor or to reduce fees or other contractual payments to a contractor if the contractor does not comply with these worker protection regulations. These regulations are required to apply to all of DOE's facilities including the laboratories of both the Office of Science and NNSA. The FY03 DOD Authorization Act puts DOE on a tight schedule to promulgate the regulations and directs the Department to focus its efforts on implementing the new regulations by December 2, 2004.

DOE is working hard to comply with this Congressional mandate and will initiate a rulemaking in the near future. To the extent there are legitimate concerns regarding how DOE regulates its contractors in worker protection matters, this rulemaking will provide an opportunity to address them, including ways to achieve cost savings without diminishing the level of protection afforded DOE workers. It would also be anomalous for Congress to direct DOE to transition to external regulation at the non-military laboratories while DOE simultaneously is carrying out a Congressional mandate to promulgate its own worker health and safety regulation for all its laboratories as directed in the FY03 DOD Authorization.

Finally, pursuant to the direction in the explanation of section 317 by the conference managers for of the Consolidated Appropriations Resolution, 2003, the Department is proceeding to transfer funds from the Environment, Safety and Health (non-military) account to the NRC and the OSHA to conduct compliance audits of the ten DOE Science laboratories. Specifically, \$2,500,000 will be transferred to NRC and \$1,300,000 will be transferred to OSHA. Furthermore, the DOE's Office of Science has been directed to cooperate fully with NRC and OSHA to ensure that the compliance audits are conducted in a thorough and timely manner. The Office of Science also has been directed to devote the

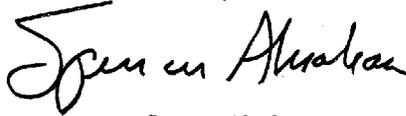
resources necessary to develop detailed cost estimates for addressing the results of these compliance audits. A report summarizing the audit results and the cost estimates for all ten laboratories is to be submitted to the House and Senate Appropriations Committees by April 30, 2004.

Thus, given the substantial effort and resources already being devoted by DOE to comply with recent Congressional direction on this issue and the potential for interference that external regulation by the NRC and OSHA presents to important Departmental missions at this time of heightened national security concern without significant offsetting benefit, the Department opposes the Costello amendment.

The Office of Management and Budget has advised that there is no objection, from the standpoint of the Administration's program, to the submission of this report on Mr. Costello's amendment to H.R. 238.

Thank you for the opportunity to provide the Department of Energy recommendation on the proposed Costello amendment to H.R. 238.

Sincerely,



Spencer Abraham

Chairman BOEHLERT. Dr. Ehlers.

Mr. EHLERS. Thank you, Mr. Chairman. Just a question for the bill sponsors. Is there any reason to not include the military labs, other than the fact that we may not have jurisdiction? Shouldn't—don't they—it seems to me—

Chairman BOEHLERT. That is a pretty good reason: we don't have jurisdiction.

Mr. EHLERS. No, but I—

Chairman BOEHLERT. Let us go home and study it some more.

Mr. EHLERS. Just—my question is not facetious. I think it would be a good idea to also include the military labs. And I wonder if both sponsors are—would agree with that, even though we can't put it in this amendment.

Mr. COSTELLO. If my colleague would yield, we have, in fact, noted that that has not been looked at, doing external regulation to the military labs. The only review that has been done have been with the civilian labs. And as you point out, we do not have juris-

diction through this committee, but it is certainly something that I think we should look at.

Mr. EHLERS. I would certainly agree with that, because the expenses we have incurred due to lack of regulation have been much greater for the military labs than the non-military. So I would hope that we would all join together in trying to persuade that committees have jurisdiction to deal with that once this is passed.

Chairman BOEHLERT. Yeah, the jurisdiction issue is somewhat hazy, but we do have some jurisdiction, obviously, but I would agree with your analysis. We ought to join together and talk to our colleagues on the Armed Services Committee. Who else seeks recognition? Mrs. Biggert.

Mrs. BIGGERT. Thank you, Mr. Chairman. I probably am one of the few skeptics here today, certainly not on the Nuclear Regulatory Commission, but on OSHA, perhaps it is because I am a Member of the Education and Work Force Committee, which has jurisdiction over OSHA. And I just want to remind the proponents of the old saying, "Be careful what you wish for, because it might come true."

And seriously, I am somewhat sympathetic to the late-breaking news out of DOE today. During the last six months to a year, Congress has been sending mixed signals to the Department on this issue. I think the fiscal year 2003 National Defense Authorization Act prohibited DOE from doing anything related to external regulation. And a few months ago, the Omnibus Appropriations Bill directed the DOE to act expeditiously to continue to look into external regulations, so I think just as we have sent mixed signals, so did the Administration. Not surprisingly, the Department losing its regulatory authority opposes external regulation, and you have that letter, while those federal agencies whose regulatory authority will be expanded are supportive of it.

So should this ultimately become—well, I look forward to closely monitoring and reviewing any transition plans prepared by the DOE, OSHA, or the NRC, so I just, you know, remain just concerned. And I can understand the frustration of many of the Members here having worked, you know, with the DOE, and—but I still have those concerns. So I thank you, Mr. Chairman, and yield back the balance of my time.

Chairman BOEHLERT. Thank you very much. Is there anyone else who seeks recognition? If not, the question is on the amendment. All in favor, say aye. No. The ayes appear to have it. The amendment is passed.

[The amendment appears on pages 219–227.]

Chairman BOEHLERT. Next up on the docket, Mrs. Biggert and Mr. Davis. The gentlelady from Illinois is recognized.

Mrs. BIGGERT. Thank you, Mr. Chairman. I have an amendment at the desk.

Chairman BOEHLERT. The Clerk will report the amendment.

The CLERK. Amendment to H.R. 238 offered by Mrs. Biggert and Mr. Davis of Tennessee.

Mrs. BIGGERT. Mr. Chairman, I ask unanimous consent that the amendment be considered as read.

Chairman BOEHLERT. Without objection, so ordered. The gentlelady is recognized for five minutes in explanation of her amendment.

[The prepared statement of Mrs. Biggert follows:]

PREPARED STATEMENT OF REPRESENTATIVE JUDY BIGGERT

Mr. Chairman, the amendment I am offering today establishes the Genomes To Life program at the Department of Energy. And I want to thank my colleagues, Mr. Davis and Mr. Smith of Michigan, for supporting me in this effort.

In the last two years, there have been many events celebrating the completion of maps of the human genome as well as other genomes, and rightly so. DOE's leadership in genome sequencing resulted in a genetic map that has been called the "recipe for life," the human "genetic fingerprint," or the "holy grail of biology."

DOE's Genomes To Life initiative goes beyond sequencing in an effort to understand how genetic components interact to perform cellular activities vital to real life. A better understanding of biological systems will enable the United States to develop new technologies related to energy production, carbon sequestration, the detection of biological and chemical agents, bioremediation, and even medicine. That's why the Office of Management and Budget and the Office of Science and Technology Policy, in their fiscal year 2004 budget guidance memo, made clear that "molecular level understanding of life processes" is a national research priority.

This will require new scientific instruments—some that haven't been invented yet—and the use of specialized facilities by multidisciplinary teams of scientists. That's why this amendment directs \$100 million to the Genomes to Life program in fiscal year 2004, and such sums as may be necessary for fiscal years 2005 through 2007, from funding already authorized in the bill for the DOE Office of Science. The Office of Science and its national laboratories are uniquely qualified to lead such a difficult and complex research effort.

Bringing together scientists from other national laboratories, academia, and industry at a number of user facilities—each with a different focus—the Genomes To Life program will lead to the development of innovative technologies and the open dissemination of data, tools, and materials. It will support research that will attract top researchers from here in the U.S. and around the world, and further strengthen U.S. leadership in biotechnology. The DOE's "big science" approach made mapping the human genome possible, and it exactly the right approach to unlocking the functional mysteries of the genome.

I urge adoption of the amendment.

[The amendment appears on pages 228–236.]

Chairman BOEHLERT. And we would, maybe, hope that you might share some of those five minutes with Mr. Davis.

Mrs. BIGGERT. Absolutely. Mr. Chairman, the amendment being offered today establishes the Genomes to Life program at the Department of Energy. I want to thank my colleagues, Mr. Davis and Mr. Smith of Michigan, for supporting me in this effort.

In the last two years, there have been many events celebrating the completion of maps of the human genome, as well as other genomes, and rightly so. DOE's leadership in genome sequencing resulted in a genetic map that has been called "the recipe for life," "the human genetic fingerprint," or the "Holy Grail of biology." Today, DOE's Genomes to Life initiative goes beyond sequencing in an effort to understand how genetic components interact to perform cellular activities vital to real life. A better understanding of biological systems will enable the United States to develop new technologies related to energy production, carbon sequestration, the detection of biological and chemical agents, viral mediation, and even medicine. So that is why the Office of Management and Budget and the Office of Science and Technology policy in their fiscal year 2004 budget guidance memo made it clear that molecular level understanding of life's processes is a national research priority.

This will require new scientific instruments, some that haven't even been invented yet, and the use of specialized facilities by multiple teams of scientists. That is why this amendment directs \$100 million to the Genomes to Life program in fiscal year 2004 and such sums as may be necessary for fiscal years 2005 through 2007 from funding already authorized in the bill for the DOE Office of Science. The Office of Science and its national laboratories are uniquely qualified to lead such a difficult and complex research effort.

I would urge adoption of this amendment and yield to the gentleman from Tennessee, Mr. Davis.

Chairman BOEHLERT. My fault, Mr. Davis is not here today.

Mrs. BIGGERT. All right. Well, then I will—

Chairman BOEHLERT. Family funeral, so you have spoke well and eloquently for you and the co-author of this amendment—

Mr. LAMPSON. Mr. Chairman.

Chairman BOEHLERT. Yes.

Mr. LAMPSON. May I speak in Mr. Davis's behalf for just one second, please?

Chairman BOEHLERT. You certainly may, Mr. Lampson.

Mr. LAMPSON. As we heard earlier, Mr. Davis was unavoidably called away by a family tragedy, and he wanted to speak in support of this amendment authored with the gentlelady from Illinois, but for obvious reasons, he can't be here. Mr. Chairman, I would ask that his statement appear in the record and that Members understand he strongly supports this amendment.

Chairman BOEHLERT. Without objection, so ordered.

[The prepared statement of Mr. Davis follows:]

PREPARED STATEMENT OF REPRESENTATIVE LINCOLN DAVIS

Thank you, Mr. Chairman. I want to thank Mrs. Biggert for her hard work on this important and exciting issue.

The Genomes to Life initiative will play an integral role in shaping the future and will help us meet the challenges of the 21st century. The role that the development of this ambitious program will play in every American's life is enormous.

This initiative builds upon existing research and scientific discovery, which has already changed the way biologists think about biology. We already have state of the art instrumentation in place that encourages the immediate establishment of this far-reaching program. However, more technological development is needed to help reach our goals in an acceptable timeframe.

We must and will meet those needs; with the work that laboratories such as Oak Ridge National Laboratory in Tennessee are already doing with their dedicated team of professionals and scientists we are well on our way to finding acceptable outcomes for increasing energy production and curbing environmental degradation.

I am excited about what the future holds in store for us in this dynamic field of genomic research.

Thank you Mr. Chairman.

Mr. LAMPSON. The fact that the Oak Ridge National Lab is one of the leaders in this research and is located near his home has absolutely nothing to do with his position, but I, too, support it. Thank you, Mr. Chairman.

Chairman BOEHLERT. Thank you. Another example of the clear spirit of bipartisanship that is so evident in the work of this committee. And I thank Mrs. Biggert and Mr. Davis. The Chair is prepared to accept the amendment. If no one else seeks recognition, we will have a vote. All in favor, say aye. Opposed no. The ayes have it. The amendment is passed. Mr. Udall, are you here?

Mr. UDALL. Thank you, Mr. Chairman.

Chairman BOEHLERT. Amendment number one of yours—number—no, number two. The amendment to add a new section to the bill on federal laboratory education partners.

Mr. UDALL. That is correct. Thank you, Mr. Chairman. I have got a brief statement. This amendment is based on the Federal Laboratory Educational Partners Act of 2003, a bill that I introduced early in the session. The bill would permit the national renewable energy laboratory and other Department of Energy laboratories to use revenue from their inventions to support science education activities.

Chairman BOEHLERT. Excuse me, Mr. Udall. We haven't had the amendment offered yet officially, so the amendment—the Clerk will report the amendment.

The CLERK. Amendment to H.R. 238 offered by Mr. Udall of Colorado.

[The amendment appears on page 218.]

Chairman BOEHLERT. All right. Now continue with your explanation, please.

Mr. UDALL. Thank you, Mr. Chairman. The amendment would amend the Stevenson-Wydler Technology Innovation Act of 1980. Under this act, federal labs can use licensing royalties for a number of purposes. My bill would add educational assistance as another permitted use of licensing royalties. Federal laboratories, especially the Department of Energy's national laboratories, with their high concentrations of scientists and engineers, are uniquely positioned to aid surrounding communities in improving the learning experience of their students. Licensing revenues have grown markedly over the years as the technologies that the renewable energy lab has created have gained wider acceptance.

It makes sense to me that we should give the labs a bit more freedom to spend these funds, especially on pursuits as worthwhile as science education, which can expose young people to the excitement in relevance of careers in science and technology. And I know, Mr. Chairman, that has been a real emphasis of yours and this committee's. And therefore, I would urge support of my amendment. I would yield back whatever time I have left.

Chairman BOEHLERT. Thank you very much. The Chair is prepared to accept the amendment. It has been worked out within the majority. Is there anyone else who seeks recognition? If not, the vote is on the amendment. All in favor, say aye. Opposed, no. The ayes have it, and the amendment is passed. Ms. Jackson Lee.

Ms. JACKSON LEE. Thank you, Mr. Chairman. I have an amendment at the desk. Thank you, Mr. Chairman, I have an amendment at the desk.

The CLERK. Amendment to H.R. 238 offered by Ms. Jackson Lee of Texas.

[The amendment appears on page 245.]

Chairman BOEHLERT. For five minutes.

Ms. JACKSON LEE. Thank you very much, Mr. Chairman. First of all, I would like to join in the chorus of my colleagues, many of my colleagues, to commend you and this committee for the bipartisan spirit in which this committee has worked in this session and

the last Congress in shaping the research and development portions of this energy bill. The underlying bill and your en bloc amendment today will ensure that the energy needs of America continue to be met in a changing world. You deserve much of the credit, along with Ranking Member Hall, and the Members of this committee, and as well, the staff.

I am particularly pleased, Mr. Chairman, that in the underlying bill, two of my amendments, one dealing with the Nation's historically black colleges and universities and the ability for them to share fully in the research funding that we offer, and as well, the amendment dealing with the secondary use of batteries that will help keep an environment that is clean and safe for all of us. Additionally, Mr. Chairman, I am gratified that the amendment that Mr. Lampson and myself offered, recognizing that I come from Houston that is known—or has been known as the energy capital of the world, that we have the opportunity to reinvestigate the resources, the oil resources in the coastal waters off of Louisiana and Texas.

With that in mind, I offer today an amendment that deals with new technology and it hopefully will bring two agencies together. My amendment will require the Department of Energy to enter into discussions with the NASA Administrator, which will enable DOE to tap into the vast expertise and energy gained from past and future research in order to find technologies that could bolster the existing commercial application programs at the DOE. I believe new technologies are emerging rapidly to harvest the power of the sun, the wind, and of water to drive progress in the new millennium. Hydrogen holds a great promise for becoming a fuel of the future to power our cars and trucks and even household devices with fuel cells. If we know that such technologies will be the way of the future, it is just smart policy to do all we can to stimulate the transition to go as efficiently and expeditiously as possible. We must also ensure that once a transition occurs that it is American companies that are on the cutting edge of technology, leading and enjoying a good proportion of the market share.

Mr. Chairman, I believe that this amendment matches two very unique agencies, of which we have oversight, the Department of Energy and NASA, to utilize their best talents to put us in the 21st century and the centuries to come. I would ask my colleagues to consider this legislation, and I offer a statement into the record that I would like to find, Mr. Chairman, if I could, that speaks to collaboration between agencies. And I thank you for giving it to me. Six federal agencies help to open the gate to enhance manufacturing and R&D. And I would ask that this article be put into the record.

Chairman BOEHLERT. Without objection, so ordered.

Ms. JACKSON LEE. And I would ask my colleagues to support this amendment.

[The prepared statement of Ms. Jackson Lee follows:]

PREPARED STATEMENT OF REPRESENTATIVE SHEILA JACKSON LEE

Thank you Mr. Chairman.

I would first like to commend you for your work and bipartisan spirit in this Congress and the last Congress in shaping the Research and Development portions of this Energy Bill. The underlying bill and your en bloc amendment today, will ensure

that the Energy needs of America continue to be met in a changing world. You and Ranking Member Hall deserve much credit for that, and I am pleased to have been a part of the process.

I am particularly pleased to see that three amendments that I offered in the last Congress have been incorporated into the underlying bill. Ensuring that our nation's Historically Black Colleges and Universities receive their fair share of research funding, will allow us to harvest their great expertise and skills. It will also ensure that the next generation of leaders in the critical field of energy production and utilization will reflect the diversity of our great nation. Second, my provision for the secondary use of batteries will also help keep our environment clean and improve the efficiency of energy use in the future.

Third, I am gratified to see that language offered by my colleague from Houston Nick Lampson and me has been preserved, requiring the Secretary of the Interior to report to the Congress as to the oil and natural gas reserves in waters off the coast of Louisiana and Texas. No matter how we decide to manage our resources in the future, it is important that we take stock and are informed about our options.

Mr. Chairman, I thank you for working in an open-minded bipartisan way and supporting those amendments. Similarly, I hope that you give your support to my amendment today, which I believe could serve as a catalyst to address two issues that have dominated much of our discussion over the past months: 1) the need to pursue alternative energy sources, and 2) the need to stimulate our nation's industrial sector to lead in that pursuit.

I come from Houston, Texas, what has been called the energy capital of the world, and I appreciate that oil and fossil fuels deserve much credit for driving our economy and prosperity over the past centuries. I know that coal, oil, and natural gas will continue to play a large role over the next century at meeting our energy needs. However, we all know that fossil fuels are not the wave of the new millennium. Our children, especially in the inner cities like in my District of Houston, have an epidemic of asthma from breathing smog and polluted air. We are overly dependent on foreign sources of oil, bought from people that we would prefer not be reliant on. No matter how safe we try to be, shipping and pumping oil will occasionally lead to spills and leaks that have tremendous detrimental effects on the environment.

But there is great hope on the horizon. New technologies are emerging rapidly to harvest the power of the sun, the wind, and of water to drive progress in the new millennium. Hydrogen holds great promise for becoming a fuel of the future to power our cars and trucks and even household devices with fuel cells. If we know that such technologies will be the way of the future—it is just smart policy to do all we can to stimulate the transition to go as efficiently and expeditiously as possible. We must also ensure that once the transition occurs, that it is American companies that are on the cutting edge of technology—leading and enjoying a good proportion of market share.

Unfortunately, that is not what has been happening so far. The Japanese have been a step ahead of the U.S. on producing hybrid and hydrogen fuel cell cars. Solar power is coming along fairly well, but cost-effective engineering is still progressing too slowly. The Dutch have become the world leaders in wind power generation. I am proud to note that Shell Oil in my District has recognized that the times are changing, and has formed Shell Hydrogen to start taking the lead in hydrogen fuel technology—but more must be done.

The Federal Government role should be to make investments to stimulate these industries and to leverage investments out of the private sector to encourage them to take the lead on energy issues. NASA is one agency that has already been successful at this, but I feel they can do even more. For example, NASA has been using hydrogen fuels in rockets for decades. They may have expertise and data from past or future work that could be of value to industry. NASA also has great experience in research and development of solar cells.

Another example is that a windmill is basically an airplane built backward. It has a propeller and a turbine. Many of the materials and the aerodynamics are the same. There is no reason that the U.S. the leader in aviation technology should be lagging behind in wind power generation, especially when our civil aviation industry is struggling with few new orders, and a decreased market share. I would love to see Boeing put their engineers to work designing and building the next generation of wind turbines. NASA's aeronautics division may provide them with some guidance and stimulation.

My amendment will require the Department of Energy to enter into discussions with the NASA Administrator, which will enable DOE to tap into the vast expertise in energy gained from past and future research—in order to find technologies that could bolster the existing commercial applications programs at the DOE.

I would like ask unanimous consent to enter into the record a news release from NIST dated March 5, 2003, titled, "Six Federal Agencies to Help Open the 'GATE' to Enhanced Manufacturing R&D." It describes that six agencies, including NIST, DOE, NASA, and the Office of Energy Efficiency and Renewable Energy, have launched an effort to improve the exchange of information about their technical programs and to collaborate, in order to "enhance payoffs from federal investments." I applaud that effort.

Unfortunately, they have limited their initial priority areas of focus to intelligence in manufacturing and nanotechnology.

Energy security is absolutely vital to our nation's long-term survival, and the well-being of our environment. My amendment will build on the existing agreement between the six agencies, by broadening their focus to include DOE/NASA interactions meant to stimulate progress in development of alternative and renewable energy sources.

It will have minimal cost, but could yield great benefits. Mr. Chairman, I hope that you will support this smart-policy piece of legislation.

I would also like to add my support to the excellent amendments being offered today by my Democratic colleagues. Our energy needs are complex. We need to be approaching energy policy from multiple directions, with diverse input, in a bipartisan fashion, in order to develop creative strategies for fueling the economy of the future in the sensitive global environment. This committee has done a good job of doing that in the past, and I hope we will continue to do so today. Thank you.



## Six Federal Agencies to Help Open the 'GATE' to Enhanced Manufacturing R&D

FOR IMMEDIATE RELEASE:  
March 5, 2003

CONTACT: Laura Ost  
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NIST 2003-03

Six federal agencies involved in manufacturing research and development (R&D) have launched a major effort to improve the exchange of information about their technical programs, and collaborate where appropriate, to enhance the payoffs from federal investments in this area.

The Government Agencies Technology Exchange in Manufacturing (GATE-M) will comprehensively address manufacturing R&D across the federal government. Agencies involved include the departments of Commerce (represented by the National Institute of Standards and Technology, or NIST), Defense, and Energy (represented by two separate entities: the National Nuclear Security Administration and the Office of Energy Efficiency and Renewable Energy), as well as the National Aeronautics and Space Administration (NASA) and the National Science Foundation (NSF).

GATE-M agencies, U.S. manufacturers and the economy could benefit from the agencies' expanded efforts to (1) exchange and leverage information about their technical programs; (2) facilitate collaboration when it makes sense to leverage resources to address particular issues; and (3) advance issues on an interagency, national level.

Two topics have been identified as initial priority areas in which all six GATE-M agencies have activities under way or could benefit from new activity. These areas are:

- **Intelligence in manufacturing**, a cross-cutting technology area that could transform how manufacturing is carried out in the future. Industry is only beginning to use capabilities made possible by intelligent, open-architecture controls, and activities in this area could have a major impact on supply chain cost, quality and reliability. In addition, agencies with product-oriented missions might be able to apply technology developed at other agencies to specific manufacturing problems.
- **Nano- and micro-scale systems and technologies**, an emerging area of science and technology that promises to have a significant and broad impact on U.S. manufacturing as well as the nation's economy. This area presents many manufacturing and systems issues related to electrical and mechanical applications, assembly, and measuring techniques and tools. GATE-M activities in this area will be coordinated with the work of the National Nanotechnology Initiative.

To foster information exchange, GATE-M participants plan to conduct

detailed interagency reviews of programs in the specific areas. They also may jointly sponsor workshops, promote and sponsor the development of "roadmaps" in specific technical areas, and conduct multi-agency brainstorming sessions. It is GATE-M's intent to involve the nation's manufacturing community of industry, government, academia and manufacturing associations in an integrated effort. Other technical areas of interest to the GATE-M agencies include environmentally focused technologies and processes; homeland and national security; manufacturing education; manufacturing process development-metals and composites; manufacturing quality and reliability (measurement and testing); and supply chain/systems integration and interoperability.

With respect to promotion, GATE-M plans to issue joint white papers or position papers that represent interagency positions. Other possible strategies include the issuance of joint "challenges" to the research community to tackle and solve difficult technical obstacles, the development of joint Small Business Innovative Research (SBIR) topics and awards, and joint support of studies by authoritative third parties to address technical issues.

For more information, contact David Stieren, NIST Manufacturing Engineering Laboratory, (301) 975-3197, [david.stieren@nist.gov](mailto:david.stieren@nist.gov). A copy of the GATE-M report is available online at [www.mel.nist.gov/pdfs/ir6950.pdf](http://www.mel.nist.gov/pdfs/ir6950.pdf).

Chairman BOEHLERT. Thank you very much, Ms. Jackson Lee. The Chair feels the amendment adds to the quality and comprehensive nature of the bill and is prepared to accept it. Is there anyone who seeks recognition? If not, the vote is on the amendment. All in favor, say aye. All opposed, nay. The ayes have it. The amendment is passed. Next up, Mr. Rohrabacher.

Mr. ROHRABACHER. Thank you very much, Mr. Chairman. I apologize for being running in and out during this markup. There is another markup in my other major committee going on at precisely the same time. And we have all had that experience.

Chairman BOEHLERT. There is a major committee other than the Science Committee?

Mr. ROHRABACHER. These are my two main committees, for sure. And I—this legislation—

Chairman BOEHLERT. Let us just designate the amendment. The Clerk will read.

Mr. ROHRABACHER. Okay.

The CLERK. Amendment to H.R. 238 offered by Mr. Rohrabacher.

[The amendment appears on pages 237–244.]

Chairman BOEHLERT. Thank you very much. Mr. Rohrabacher is recognized for five short minutes.

Mr. ROHRABACHER. Thank you very much. This amendment is actually motivated by some of the testimony that we have heard here as of late about the lack of participation by American born students in our graduate programs of science and engineering and mathematics. And we learned during our hearings from various dif-

ferent institutions that only—that 54 percent of all Ph.D.s that were being given in engineering and sciences are going—54 percent of them are going to people who are not American citizens and are not residents of our country. So this amendment is designed to try to take a step in the right direction in dealing with that problem by—and it could be duplicated. This will be for the Department of Energy, but it could be duplicated for NASA, EPA, NOAA, the Patent Office or any number of things. We might make it a much larger bill or we might just do this one at a time.

But this amendment would provide scholarships for American young people who want to have—want to go to do graduate work, Masters and Ph.D. work at our universities and colleges. It provides for all of their expenses and what—and for pay back, they will have to work for the Department of Energy, in this particular case, for two years for every year of educational subsidy that is provided them. And I think that the need speaks for itself. We need to make sure our young people who now don't go on to get their Ph.D.s and Masters degrees in the sciences because they have been offered good jobs, and it is an incredible penalty for them to go on with their education, compared to foreign students who, if they immediately take a job, they actually are making less money than if they are subsidized in their education by their governments. So this, I think, would be a tremendous help, especially to young people of middle class and people who are in economic need, to get involved in the sciences. And I would hope that this would have support on both sides of the aisle.

Chairman BOEHLERT. The gentleman is to be commended for the leadership he is evidencing in this very important subject, and it shows the value of the hearings we have—

Mr. ROHRABACHER. Right.

Chairman BOEHLERT.—in preparation. As you know, Mr. Rohrabacher, this is something that Mr. Hall and I feel very strongly about, and we are working on it in a number of other areas. This is our opportunity today. I commend you for seizing it. Is there anyone else that feels compelled to speak on the subject? If not, the vote is on the amendment. All in favor, say aye. No. The ayes appear to have it, and the amendment is passed.

Next we will go to the en bloc amendment. I ask that the amendment offered by Mr. Hall and myself be considered en bloc. The Clerk will report.

The CLERK. En bloc amendments to H.R. 238 offered by Mr. Boehlert and Mr. Hall.

[The amendment appears on pages 270–324.]

Chairman BOEHLERT. The Chair recognizes myself for such time as I may consume. I won't take much time in describing the amendment simply because we are all well versed as we are in the rest of the program for today. And I would point out that we have a national security briefing at 4:00, and it is the Chair's intention, without trying to rush things, to complete by 4:00, so we can all take advantage of that national security briefing. So I will be brief.

I described the primary provisions in my opening statement. I am sure there are many Members who contributed provisions who want to be recognized to describe their portions of the bill. But once

again, we are operating under some time constraint, so I hope that you would all be considerate of each other's time in our desire to go to that very important national security briefing. So just let me say that this en bloc amendment updates the bill, adds several useful new programs to the DOE portfolio, and I urge its adoption. Mr. Hall.

Mr. HALL. Mr. Chairman, you have stated it very well, and I think that this is also in recognition of the great work of our staffs and that they have worked together on this longer hours, really, than we have put on it, much longer. And I think we have arrived at a good bill, and of course, I urge its adoption.

Chairman BOEHLERT. Thank you so much for, again, noting the outstanding work of both the minority and the majority staff. These are dedicated professionals who work very long and very hard to make possible a markup like today's markup. It doesn't happen just like that, it happens because there are hours and hours and weeks and weeks of hard work put into this. And so all of us should commend our professional staff for the very professional job it does. And thank you all from the part—my part, Mr. Hall's part. Let us give them a hand. The Chair recognizes Mr. Wu.

Mr. WU. Thank you, Mr. Chairman. I ask unanimous consent that my amendment concerning electrical grids and setting standards for research be included in the en bloc amendment. And I thank you for working with me and thank staff for working with each other.

Chairman BOEHLERT. Without objection, because this has been worked out on a bipartisan basis, so ordered.

[The amendment appears on pages 325–326.]

Chairman BOEHLERT. Anyone else seek—Mrs. Biggert.

Mrs. BIGGERT. Thank you, Mr. Chairman. I would just ask that my written statement be entered into the record.

Chairman BOEHLERT. Without objection, so ordered.

[The prepared statement of Mrs. Biggert follows:]

#### PREPARED STATEMENT OF REPRESENTATIVE JUDY BIGGERT

Thank you, Mr. Chairman. I know I have only been Chairman of the Energy Subcommittee for a very short time, but it has been a real honor and pleasure to work with you and your excellent staff to help shape a very important portion of much needed comprehensive energy legislation.

America now has the motivation—perhaps like no other time since the oil crisis of the '70's—to find newer and better ways to meet our energy needs. Our dependence on foreign oil sources is up to 55 to 60 percent. Renewed violence in the Middle East, the war against terrorism, and now the war with Iraq will continue to cause more volatility in energy markets and energy prices than any of us will find acceptable. Consider that the United States is home to only two percent of the world's supply of oil, and has been It doesn't take a chemical engineer or a foreign policy expert to understand what that equals—continued dependence on increasingly uncertain sources.

What I liked most about the National Energy Policy proposed by President Bush two years ago next month is that it emphasizes the use of advanced technology to expand and diversify our energy supply while reducing our energy demand. But advanced technologies don't grow on trees, they grow out of basic scientific research like that supported by the Department of Energy at our universities and national laboratories.

That's why we are here today. To make sure the Department of Energy has the resources it needs for America to remain a leader in science and technology.

I particularly want to thank the Chairman for working with me to increase funding for the DOE Office of Science, the Nation's primary supporter of research in the physical sciences.

In a report released at the end of August last year, the President's Council of Advisors on Science and Technology, or P-CAST, recommended that R&D for the physical sciences and engineering should be brought to parity with the life sciences over the next five budget cycles. As the P-CAST report points out, "It is widely understood and acknowledged that the interdependencies of the various disciplines require that all advance together."

By incorporating provisions from my bill, H.R. 34, the Energy and Science Research Investment Act, the manager's amendment effectively provides a 60 percent increase for the DOE Office of Science over four years.

This increase is needed and warranted. While federally supported medical research like that conducted by NIH has doubled, funding for research in the physical sciences has remained stagnant. In each of the last three fiscal years, the Office of Science has been flat funded. In constant dollars, the budget for the Office of Science is still only at its 1990 level. The additional funding this bill provides will enable the Office of Science to support core programs while investing in important new user facilities and new initiatives, like nanotechnology and Genomes to Life.

I also want to thank the Chairman for including in the manager's amendment provisions from a bill I introduced in the 107th Congress to strengthen nuclear research and nuclear science and engineering programs at America's universities and colleges.

Fewer Americans are entering this field and even fewer institutions are left with the capability to train them. In fact, the supply of four-year trained nuclear scientists has hit a 35-year low and there are only 28 universities that operate research reactors—less than half the number there were in 1980.

These statistics tell but the beginning of the story, however. Current projections are that 25 to 30 percent of the nuclear industry's workforce and 76 percent of the nuclear workforce at our national laboratories are eligible to retire in the next five years.

Nuclear science and engineering in the United States is a 50-year success story that has been written by some of the brightest minds the world has ever known. America has truly been blessed as the world leader in this area, and provisions in the manager's amendment will ensure we maintain our leadership.

All in all, this is an excellent bill made better by the manager's en bloc amendment. I urge my friends on the committee to support both.

I yield back the balance of my time.

Chairman BOEHLERT. Ms. Eddie Bernice Johnson.

Ms. JOHNSON. Thank you, Mr. Chairman. And I would like to commend you and the staff on the hydrogen provisions in this bill in conjunction with the President's Hydrogen Initiative. These sections prescribe aggressive steps toward the development of a clean and efficient hydrogen economy, especially in regards to the transportation sector. However, I would like to emphasize the infrastructure and stationary applications of hydrogen production and that these applications can not be overlooked, as they are essential to the widespread adoption of hydrogen technologies. And so I would like to offer the amendment, which you have already accepted, I think, en bloc.

Chairman BOEHLERT. Oh, to be added to the en bloc amendments?

Ms. JOHNSON. Yes.

Chairman BOEHLERT. Without objection, so ordered.

[The prepared statement of Ms. Johnson follows:]

PREPARED STATEMENT OF REPRESENTATIVE EDDIE BERNICE JOHNSON

Thank you Mr. Chairman.

I would like to commend you on the hydrogen provisions in this bill. In conjunction with the President's Hydrogen Initiative, these sections prescribe aggressive steps towards the development of a clean and efficient hydrogen economy, especially in regards to the transportation sector.

However, I would like to emphasize the *infrastructure* and *stationary* applications of hydrogen production.

These applications cannot be overlooked as they are essential to the widespread adoption of hydrogen technologies.

Therefore I would like to offer this amendment to the Boehlert/Hall En Bloc Amendment.

It simply adds another goal highlighting a hydrogen fuels infrastructure for stationary as well as mobile hydrogen fuel cells, and ensures that future hydrogen fuels will be a safer, cleaner, more efficient and better performing improvement over our current fuels.

[The amendment appears on page 327.]

Chairman BOEHLERT. Thank you very much.

Ms. JOHNSON. Thank you.

Chairman BOEHLERT. Anyone else? Dr. Burgess.

Mr. BURGESS. Thank you, Mr. Chairman. I would also request unanimous consent that my written comments be entered in the record. I—

Chairman BOEHLERT. Without objection.

[The prepared statement of Mr. Burgess follows:]

PREPARED STATEMENT OF REPRESENTATIVE MICHAEL C. BURGESS

Mr. Chairman, I rise this afternoon in support of the Boehlert-Hall En Bloc amendment to H.R. 238, The Energy Research, Development, Demonstration, and Commercial Application Act of 2003.

America needs a comprehensive energy bill so that we can ensure achievement of our goal of national energy independence.

President Bush, during his State-of-the-Union Address, proposed a bold FreedomCAR and Hydrogen Fuel Initiative and estimated that the first car driven by a child born today could be powered by hydrogen technology. The goal of this new FreedomCAR program is to make hydrogen fuel cell technology a viable, affordable and convenient technology that we can use to power our automobiles. There are many benefits, including a cleaner environment, the possibility that research can spur further technological innovation, and especially greater energy independence.

The Boehlert-Hall amendment would authorize President Bush's FreedomCAR program and Hydrogen Initiative, authorize the President's funding request of \$1.7 billion over five years, and create a research, development, demonstration, and commercial application program for hydrogen-powered stationary fuel cells and fuel cell vehicles and the refueling infrastructure to support them.

But as we consider comprehensive energy policy, we must also take seriously our responsibility to ensure that taxpayer dollars are spent wisely. The En Bloc amendment achieves this by further specifying how federal research dollars should be spent, and by requiring the Department of Energy to submit a detailed plan to Congress describing the program's research agenda, the technical milestones used to evaluate the performance of the program, and the role that national laboratories, universities, and other stakeholders will play.

In addition, the En Bloc amendment will support nanotechnology research and development, which is important to the University of North Texas in my district, by modifying H.R. 238 to authorize the Department of Energy's portion of the program. This will ensure continued U.S. leadership in nanotechnology across scientific and engineering disciplines.

Again, thank you, Mr. Chairman, for allowing me the opportunity to express my thoughts about the research and development title of the Energy Bill.

Mr. BURGESS.—would also just add that the nanotechnology research and development is so vitally important to the University of North Texas in my District, and I commend the Chairman and the Ranking Member for their leadership in support of this program. We must ensure the continued United States leadership in nanotechnology across the scientific and engineering disciplines.

Chairman BOEHLERT. Thank you very much. And we couldn't agree more with that observation, Doctor, and I thank you for making it. Ms. Woolsey.

Ms. WOOLSEY. Mr. Chairman, I, too, would like to enter my long words in the record, but what they say is thank you very much for including in your bill Section 202, which establishes a DOE program to help bring renewable energy technologies to public buildings. Thank you very much.

Chairman BOEHLERT. Thank you very much. Without objection, so ordered.

[The prepared statement of Ms. Woolsey follows:]

PREPARED STATEMENT OF REPRESENTATIVE LYNN WOOLSEY

Mr. Chairman, today represents another opportunity for this committee to address the future energy needs of our country, and determine the direction DOE's R&D and commercial applications programs should take. No doubt, those around this dias have varying visions of what they want our energy future to look like—that's why I commend the Chairman's success in bringing a bipartisan bill forward today for consideration.

The base bill, H.R. 238, contains numerous provisions that we worked on last Congress during Committee consideration and conference negotiations of an energy bill when I was the Ranking Member of the Energy Subcommittee. As a Californian, and a Member from one of the most environmentally conscious districts in the country, my time in Congress has focused on an energy future that relies increasingly on energy sources that are renewable and minimize impacts on our environment. That's why I'm pleased that H.R. 238 embraces our previous negotiations on R&D goals and authorization funding levels for renewable energy and energy efficiency measures as well as the establishment of a Next Generation Lighting Initiative and a National Building Performance Initiative. These all remain important elements in our efforts for a secure energy future. We must wean ourselves from dirty fossil fuel energy sources, which means we must make *new* investments in renewable energy and energy efficient technologies and help bring these technologies to the marketplace.

That's why this Congress I again introduced the "Renewable Energy & Energy Efficiency Act," H.R. 1343. A cornerstone of this bill is its aggressive goals and funding levels for renewable energy and energy efficient technologies. H.R. 1343 also has several commercial application provisions, and, I'm pleased that this en bloc amendment incorporates one based on my bill's Section 202 to establish a DOE program to help bring renewable energy technologies to public buildings.

Mr. Chairman, Section 202 of my bill is based on the work of the City of Sebastopol in my district. In conjunction with staff and students at Sonoma State University, the City has developed a plan to deploy solar technology in Sebastopol's residential, commercial, and municipal buildings. This plan represents a real commitment by Sebastopol to make a significant transition to using renewable energy, and I'm proud that the Federal Government—through my provision in the en bloc—can now partner with local municipalities like Sebastopol to secure their energy future.

Thank you also, Mr. Chairman, for including in the en bloc a clarification to Section 106, the National Building Performance Initiative, to assure that "whole building practices" are part of the Initiative. Last Congress I proposed this Initiative to ensure that federal agency coordination among its building technology-related programs remained forward thinking. "Whole building practices" will let us draw on our improved understanding of how decisions made in the design stage and how buildings are operated—including use of daylighting, solar and renewable technologies, and state-of-the-art ventilation systems—can positively affect the performance of the building and people working and studying there. These and other best building practices are key to making sure that buildings are energy-efficient over the next several decades.

Mr. Chairman, I must also state for the record that I have an overarching concern about the level of funding in today's bill for nuclear R&D. I'm concerned about this committee making a priority an industry that many believe we should move away from. While the industry claims that nuclear power is safe, the fact remains that people are skeptical—it's a dangerous, expensive energy source and has not delivered on decades-old promises of energy security and independence. The time has

come to move away from nuclear power for many reasons: the danger of radioactive contamination; the unsolved problem of nuclear waste; the threat of an accident; the threat of air and water pollution; resource depletion; and nuclear proliferation.

Mr. Chairman, despite my disagreement on this bill's funding levels for nuclear energy, overall I commend you for working with our Democratic Members on the Committee to find common ground on the breadth and depth of our interests. That's why I'll support this en bloc amendment and favorably reporting H.R. 238 out of Committee. I urge my colleagues to do so as well.

Thank you.

Chairman BOEHLERT. Dr. Ehlers.

Mr. EHLERS. Thank you, Mr. Chairman. I am sorry I didn't speak up quickly enough, but I wanted to have a quick conversation with Ms. Johnson on her amendment. As I read this, and I just want to make certain I am reading this properly, and I want the record to show that. The way it is worded, I believe it indicates that part C, the improved overall efficiency in zero or near-zero emissions when compared to fuels used in 2003, would also include the overall efficiency and zero or near-zero emissions that are involved of the production of the hydrogen, not just the use of the hydrogen in the fuel cells, but also the process that would produce the hydrogen. And was—I just wanted to—and I will yield time to Ms. Johnson. Was that the intent to include the production process in that as well as the use within the fuel cells?

Ms. JOHNSON. Yes, Mr. Ehlers. That is the intent.

Mr. EHLERS. All right. It is not crystal clear, and I think it is going to be a very important point. And I would like to request of Ms. Johnson that perhaps we could make—offer an additional amendment to be taken up at the time it goes to the Floor, just to very clearly make that statement.

Ms. JOHNSON. Mr. Chairman.

Chairman BOEHLERT. That is fine. I think this gentleman agrees, and we will make sure that that is clear in the report language. Thank you for that observation, Dr. Ehlers.

Ms. JOHNSON. Thank you.

Mr. EHLERS. I yield back, and I thank you.

Chairman BOEHLERT. Is there anyone else who seeks recognition?

Mr. SMITH OF MICHIGAN. I think you said earlier—I want my statement, but I think you said earlier, all statements are—would be in the record, is that correct?

Chairman BOEHLERT. That is right, because we can't wait to read the eloquent prose that people like you, from Michigan. Thank you so much. Mr. Bell.

Mr. BELL. Thank you, Mr. Chairman. I don't want to make you read my eloquent prose. If I could just share it with you here. I wanted to thank you for adopting my language into the en bloc amendment and ensuring that the potential of nanotechnology to produce or facilitate the production of clean, inexpensive energy is realized by supporting nanotechnology energy applications research and development.

Nanotechnology holds the promise to radically increase the strength and reduce the weight of many commercial projects—products. These new super strong, lightweight products will be built with minimal waste byproduct production and will reduce energy consumption. Nanotechnology can make energy production cheap

and relatively pollution free by, for example, reducing the cost of solar and fuel cell technology 10 to 100 fold. Nanotech light technology will replace incandescent and fluorescent lights with enormous energy cost savings across every sector of the economy. So you can see how important it is. I thank you for adopting the language. Thank you, Mr. Chairman.

Chairman BOEHLERT. Thank you very much. We are going to deal with nano—the Nanotechnology Initiative right after the Easter recess. I would hope everybody could bear with us just a couple of more minutes, because we will be able to complete the bill, and then we can go on to our other important business. The question is on the amendment. All in favor, say aye. Opposed, no. The ayes have it. The amendment is passed. What is next? Mr. Bell. Mr. Sherman and Mr. Bell. Who wants to address the—

Mr. BELL. Thank you, Mr. Chairman. I have an amendment at the desk.

Chairman BOEHLERT. The Clerk will read.

The CLERK. Amendment offered by Mr. Sherman and Mr. Bell to the amendments offered by Mr. Boehlert.

[The amendment appears on page 328.]

Chairman BOEHLERT. The gentleman is recognized for five minutes.

Mr. BELL. Thank you, Mr. Chairman. I am offering this amendment on behalf of myself and my colleague, Mr. Sherman. This amendment establishes a program to examine societal and ethical issues that may be associated with new developments in nanotechnology. I expect developments in nanotechnology to improve our lives, but as with all technologies, there may be some instances where we create new challenges even as we solve existing problems.

I believe a program of this nature will help us to maximize the benefits of nanotechnology while avoiding any potential problems. This language is very similar to the language in H.R. 766, the nanotechnology bill introduced by Chairman Boehlert and Representative Honda. It adds a reporting requirement to enable us to track the projects that are funded in this area. Too little of our federal dollars are spent to ensure that society reaps only positive benefits from nanotechnology.

History has many examples of promising technologies whose hidden costs were only determined after widespread adoption. These include nuclear power, which continues to generate an enormous amount of toxic waste, DDT, which wiped out malaria mosquitoes in the U.S. but was harmful to animal life, semi-conductor manufacturing, which ushered in the computer revolution but resulted in environmental contamination, and the list goes on. We should ensure that the environmental and toxicological impacts of nanotechnological applications are studied during the development process so that problems can be spotted early and fixed before damage is done. Prevention is better and cheaper than clean up. I would ask for your support for the amendment.

Chairman BOEHLERT. Thank you very much. We have had some discussions on this, and I would ask unanimous consent that the gentleman be allowed to amend his original amendment to reflect

the outcome of those discussions on a bipartisan basis. Without objection, so ordered. And will you offer that specific language?

Mr. BELL. Yes, Mr. Chairman.

Chairman BOEHLERT. All right. And then having the understanding that this has been accepted on a bipartisan basis after some very thorough discussion on a subject matter we are all interested in, nanotechnology, I would further ask unanimous consent that this amended amendment be included in the en bloc amendment just previously approved. Is there any objection?

Ms. LOFGREN. Reserving the right to object.

Chairman BOEHLERT. Who do I hear from?

Ms. LOFGREN. You are hearing from—

Chairman BOEHLERT. Yes, Ms. Lofgren.

Ms. LOFGREN.—me, and I am reserving the right to object. I will not object. I missed the chance to thank you during the en bloc amendment, because I was down in judiciary, and I do thank you for your inclusion of the fusion bill, and I withdraw my reservation.

Chairman BOEHLERT. Thank you so much. I appreciate that.

Mr. COSTELLO. Mr. Chairman.

Chairman BOEHLERT. Who seeks recognition? Mr. Costello.

Mr. COSTELLO. Mr. Chairman, I, too, would like to thank you. I was in the side ante room when we did the en bloc amendment, and I just wanted to thank you for working with us, you and Mr. Hall in particular, for working with us on the Clean Coal Technology. We appreciate it very much and look forward to going to conference on this bill.

Chairman BOEHLERT. Thank you very much. Let me just—the Chair would like to make an observation. This is my 21st year, only my 3rd year in the Chair, but we spend a lot of time at these hearings thanking each other for doing things the right way. We are civil. We are bipartisan. We consider each other's point of view. We don't always agree with it. And I take great pride in the manner in which this committee operates on both sides of the aisle and great pride in the professionalism evident by the staff in all instances. So while I welcome the praise, let me tell you, it is due to all of us for the way we operate this committee. Now the only thing standing in the way of completing our business is my distinguished colleague from Colorado, Mr. Udall. And at this juncture, the Chair will recognize him.

Mr. UDALL. Thank you, Mr. Chairman. I do have—and I will get it right this time. I have an amendment at the desk.

Chairman BOEHLERT. The Clerk will report. Don't go too far, because we have got a quorum we want to keep.

The CLERK. Amendment to H.R. 238 offered by Mr. Udall.

[The amendment appears on pages 246–269.]

Mr. UDALL. Mr. Chairman, I ask unanimous consent that the amendment be considered as read.

Chairman BOEHLERT. Without objection, so ordered. The gentleman is recognized for five minutes.

Mr. UDALL. Thank you, Mr. Chairman. I would like to offer at this time the amendment that we discussed. It is based on a bill that I introduced in the last Congress and that I reintroduced today, the Global Change Research and Data Management Act.

The bill would update and reorient the current U.S. Global Change Research Program, which was established by law in 1990. Over the past decade, the research program has significantly advanced our scientific knowledge of Earth's atmosphere and climate, and it has provided us with a wealth of new data and information about the functioning of our planet.

However, the program has not produced sufficient information about terms of content and format to be the basis for sound decisions. In its recent review of the Administration's draft strategic plan for the research program, the National Academy of Sciences acknowledged the need for research to evaluate strategies to mitigate and adapt to the impacts of global change. And the Academy recommended that the plan be revised to enhance efforts to support decision making.

My bill would reorient the program to accomplish these goals. It would require the Administration to identify and consult with members of the user community in developing the research program research plan. The bill would also mandate the involvement of the National Governor's Association in evaluating the program from the perspective of the user community. These steps would help to ensure that the information needs of the policy community will be met as generously as the funding needs of the academic community. And I think that is an important emphasis.

My bill would also establish a new interagency working group to coordinate federal policies on data management and archiving. Advances in computer monitoring and satellite technologies have vastly expanded our ability to collect and analyze data. We must do a much better job of managing and archiving these important data resources to support the work of current, and I think even more importantly, future scientists and policy makers.

As was clear from the impasse on climate provisions of the energy bill in the 107th Congress, we have yet to agree on how much more information, if any, is needed before we take actions to slow the effects of human activities on global change. These are tough policy questions that we will continue to wrestle with. This bill does not offer any specific policy direction, but it does affirm the need for continued strong federal support for global change research, and it does map out a new emphasis on production of information needed to inform these important policy debates.

As you know, Mr. Chairman, the House passed the energy bill in the 107th. Congress included no climate provisions. This effectively left the House without a negotiating position, which made the conference difficult. I am offering this amendment today both because I believe it is worthy of the Committee's consideration and also because I would like to see this committee take action in an area of its jurisdiction. I would urge support for my amendment, and I thank you, Mr. Chairman, for the time at this late hour.

Chairman BOEHLERT. Thank you very much. The Chair will reluctantly oppose this amendment, and let me say in addition to that that the Chair's heart is in the same place as the gentleman from Colorado in dealing with the very important subject of climate change. And the Chair will be willing to work with the gentleman from Colorado as we prepare for the Floor and might yet agree on an amendment that we would co-author for the Floor. But we have

not had the opportunity to really give the thought that this amendment requires to it prior to today's markup. So I would give you two options: one if you withdraw it and we will work together and maybe develop something that we can co-author for the Floor as a stand alone amendment, or two go forward and we have the role call vote and go from there. And I will reluctantly vote no. The choice is yours. Stand corrected. Stand corrected. Chief of Staff reminds me that rather than a Floor amendment, we might have a separate stand-alone bill out of this committee. So that will put the Committee on record dealing with the subject in a way that I think you and I would both wish to do to advance work in this important area of climate change. Whether or not we will get to the Floor with the bill is another question, but we will be clearly on record as we go to Floor debate on the overall energy policy.

Mr. UDALL. Will the gentleman yield?

Chairman BOEHLERT. I would be glad to yield.

Mr. UDALL. Thank you, Mr. Chairman. If we could move this bill that I brought forward, I think the Chairman's offer is one that makes good sense. I would like to see it come out of the Committee and have a chance to at least be considered—

Chairman BOEHLERT. That would be the Chair's intent. Raise my right hand. I do solemnly swear.

Mr. UDALL. Would the Chair yield?

Chairman BOEHLERT. I would be glad to yield.

Mr. UDALL. Mr. Chairman, you have always operated and kept your word, and in that spirit, I would withdraw the amendment and look forward to working with you to move my bill in the near future.

Chairman BOEHLERT. Thank you so much. Without objection, so ordered. Are there any other amendments? Hearing none, the question is on the bill, H.R. 238, *Energy Research Development, Demonstration, and Commercial Application Act of 2003* as amended. All in favor say aye. Opposed, no. In the opinion of the Chair, the ayes have it. I now recognize Mr. Hall for a motion.

Mr. HALL. Mr. Chairman, I move that the Committee favorably report H.R. 238 as amended to the House with the recommendation that the bill, as amended, do pass. Furthermore, I move that staff be instructed to prepare the legislative report, make necessary technical and conforming changes, and that the Chairman take all necessary steps to bring the bill before the House for consideration.

Chairman BOEHLERT. The Chair notes the presence of a reported quorum. 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 appear to have it, and the bill is favorably reported. Without objection, the order—the motion to reconsider is laid upon the table. I move that Members have two subsequent calendar days in which to submit supplemental minority or additional views on the measure. I move pursuant to clause 1 of rule 22 of the House—rules of the House of Representatives that the Committee authorize the Chairman to offer such motions as may be necessary in the House to go to conference with the Senate on the bill H.R. 238 or a similar Senate bill. This concludes our committee markup. I thank my colleagues for their indulgence. The meeting is adjourned.

[Whereupon, 4:03 p.m., the Committee was adjourned.]



Amendments to H.R. 238

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**AMENDMENT TO H.R. 238**  
**OFFERED BY MR. MILLER OF NORTH CAROLINA**

Page 32, after line 20, insert the following new part:

1       **PART 6—ADVANCED ENERGY TECHNOLOGY**  
2                               **TRANSFER CENTERS**  
3       **SEC. 110A. ADVANCED ENERGY TECHNOLOGY TRANSFER**  
4                               **CENTERS.**

5           (a) **GRANTS.**—Not later than 18 months after the  
6 date of the enactment of this Act, the Secretary shall  
7 make grants to nonprofit institutions, State and local gov-  
8 ernments, or universities (or consortia thereof), to estab-  
9 lish a nationwide network of at least 10 Advanced Energy  
10 Technology Transfer Centers, to be located in areas the  
11 Secretary determines have the greatest need of the serv-  
12 ices of such Centers.

13           (b) **ACTIVITIES.**—(1) Each Center shall operate a  
14 program to encourage demonstration and commercial ap-  
15 plication of advanced energy methods and technologies  
16 through education and outreach to building and industrial  
17 professionals, and to other individuals and organizations  
18 with an interest in efficient energy use.

19           (2) Each Center shall establish an advisory panel to  
20 advise the Center on how best to accomplish the activities  
21 under paragraph (1).

1 (c) APPLICATION.—A person seeking a grant under  
2 this section shall submit to the Secretary an application  
3 in such form and containing such information as the Sec-  
4 retary may require. The Secretary may award a grant  
5 under this section to an entity already in existence if the  
6 entity is otherwise eligible under this section.

7 (d) SELECTION CRITERIA.—The Secretary shall  
8 award grants under this section on the basis of the fol-  
9 lowing criteria, at a minimum:

10 (1) The ability of the applicant to carry out the  
11 activities in subsection (b).

12 (2) The extent to which the applicant will co-  
13 ordinate the activities of the Center with other enti-  
14 ties, such as State and local governments, utilities,  
15 and educational and research institutions.

16 (e) MATCHING FUNDS.—The Secretary shall require  
17 a non-Federal matching requirement of at least 50 percent  
18 of the costs of establishing and operating each Center.

19 (f) ADVISORY COMMITTEE.—The Secretary shall es-  
20 tablish an advisory committee to advise the Secretary on  
21 the establishment of Centers under this section. The advi-  
22 sory committee shall be composed of individuals with ex-  
23 pertise in the area of advanced energy methods and tech-  
24 nologies, including at least 1 representative from—

25 (1) State or local energy offices;

- 1 (2) energy professionals;
- 2 (3) trade or professional associations;
- 3 (4) architects, engineers, or construction profes-
- 4 sionals;
- 5 (5) manufacturers;
- 6 (6) the research community; and
- 7 (7) nonprofit energy or environmental organiza-
- 8 tions.

9 (g) DEFINITIONS.—For purposes of this section—

10 (1) the term “advanced energy methods and  
 11 technologies” means all methods and technologies  
 12 that promote energy efficiency and conservation, in-  
 13 cluding distributed generation technologies, and life-  
 14 cycle analysis of energy use;

15 (2) the term “Center” means an Advanced En-  
 16 ergy Technology Transfer Center established pursu-  
 17 ant to this section; and

18 (3) the term “distributed generation” means an  
 19 electric power generation facility that is designed to  
 20 serve retail electric consumers at or near the facility  
 21 site.

**AMENDMENT TO H.R. 238**  
**OFFERED BY MR. MATHESON**

Page 33, after line 20, insert the following new section:

1 **SEC. 111A. DEMONSTRATION AND FIELD TEST.**

2       The Secretary shall conduct a demonstration and  
3 field test of distributed generation systems. Such test shall  
4 be conducted in both geographically concentrated and dis-  
5 persed regions and shall define the full range of commu-  
6 nications and control system needs in distributed genera-  
7 tion systems. This test should be used to identify future  
8 research priorities and the scale-up challenges necessary  
9 to meet the Department's goals for distributed energy over  
10 the next 10 years

**AMENDMENT TO H.R. 238**  
**OFFERED BY MR. UDALL OF COLORADO**

Page 126, after line 2, insert the following new section:

1 SEC. 194. FEDERAL LABORATORY EDUCATIONAL PART-  
2 NERS.

3 (a) DISTRIBUTION OF ROYALTIES RECEIVED BY  
4 FEDERAL AGENCIES.—Section 14(a)(1)(B)(v) of the Ste-  
5 venson-Wylder Technology Innovation Act of 1980 (15  
6 U.S.C. 3710c(a)(1)(B)(v)), is amended to read as follows:

7 “(v) for scientific research and develop-  
8 ment and for educational assistance and other  
9 purposes consistent with the missions and ob-  
10 jectives of the Department of Energy and the  
11 laboratory.”.

12 (b) COOPERATIVE RESEARCH AND DEVELOPMENT  
13 AGREEMENTS.—Section 12(b)(5)(C) of the Stevenson-  
14 Wylder Technology Innovation Act of 1980 (15 U.S.C.  
15 3710a(b)(5)(C)) is amended to read as follows:

16 “(C) for scientific research and development  
17 and for educational assistance consistent with the  
18 missions and objectives of the Department of Energy  
19 and the laboratory.”.

**AMENDMENT TO H.R. 238**  
**OFFERED BY MR. COSTELLO AND MR. CALVERT**

Page 128, after line 13, insert the following new section:

1 **SEC. 202. EXTERNAL REGULATION OF DEPARTMENT OF EN-**  
2 **ERGY.**

3 (a) **ELIMINATION OF DEPARTMENT OF ENERGY AU-**  
4 **THORITY.**—Effective 2 years after the date of enactment  
5 of this Act, the Department shall have no regulatory or  
6 enforcement authority with respect to nuclear safety and  
7 occupational safety and health responsibilities assumed by  
8 the Nuclear Regulatory Commission under subsection (b)  
9 or by the Occupational Safety and Health Administration  
10 under subsection (c) at any nonmilitary energy laboratory  
11 owned or operated by the Department.

12 (b) **NUCLEAR REGULATORY COMMISSION AUTHOR-**  
13 **ITY.**—

14 (1) **NUCLEAR SAFETY REGULATORY AND EN-**  
15 **FORCEMENT RESPONSIBILITIES.**—Effective 2 years  
16 after the date of enactment of this Act, the Nuclear  
17 Regulatory Commission shall assume the nuclear  
18 safety regulatory and enforcement responsibilities of  
19 the Department under the Atomic Energy Act of

1 1954 with regard to nonmilitary energy laboratories  
2 owned or operated by the Department.

3 (2) LICENSED ENTITIES.—For the purposes of  
4 carrying out at nonmilitary energy laboratories  
5 owned or operated by the Department regulatory  
6 and enforcement responsibilities described in para-  
7 graph (1), the Nuclear Regulatory Commission may  
8 regulate; through licensing, certification, or other  
9 appropriate means, the Department's contractors.

10 (3) DECOMMISSIONING.—A contractor oper-  
11 ating a nonmilitary energy laboratory owned by the  
12 Department shall not be responsible for the costs of  
13 decommissioning that facility. No enforcement action  
14 may be taken against such contractor for any viola-  
15 tion of Nuclear Regulatory Commission decommis-  
16 sioning requirements, if such violation is the result  
17 of a failure of the Department to authorize or fund  
18 decommissioning activities. The Nuclear Regulatory  
19 Commission and the Department shall, not later  
20 than 1 year after the date of enactment of this Act,  
21 enter into a memorandum of understanding estab-  
22 lishing decommissioning procedures and require-  
23 ments for nonmilitary energy laboratories owned or  
24 operated by the Department.

1           (4) ACCELERATORS.—Notwithstanding the pro-  
2           visions of the Atomic Energy Act of 1954 (42  
3           U.S.C. 2011 et. seq.), effective 2 years after the  
4           date of enactment of this Act, the Nuclear Regu-  
5           latory Commission shall have exclusive regulatory  
6           authority over accelerators, other electronic sources  
7           of radiation not assigned to the Commission as of  
8           the date of enactment of this Act, accelerator-pro-  
9           duced radioisotopes, and naturally occurring radio-  
10          active materials at nonmilitary energy laboratories,  
11          consistent with the authorities granted the Nuclear  
12          Regulatory Commission in the Atomic Energy Act of  
13          1954. Until such time as the Commission has com-  
14          pleted a rulemaking for the foregoing equipment and  
15          radioisotopes, nonmilitary energy laboratories shall  
16          be required to meet the requirements stipulated in a  
17          license for the facility.

18          (5) ADMINISTRATION.—The responsibilities as-  
19          sumed by the Nuclear Regulatory Commission under  
20          this subsection shall be administered by the Nuclear  
21          Regulatory Commission, not by States.

22          (6) JUDICIAL REVIEW.—Section 189 b. of the  
23          Atomic Energy Act of 1954 (42 U.S.C. 2239(b)) is  
24          amended by adding the following paragraph after  
25          paragraph (4):

1           “(5) Any final order or regulation of the Com-  
2 mission establishing standards to govern nonmilitary  
3 energy laboratories owned or operated by the De-  
4 partment of Energy that is issued to implement the  
5 Commission’s responsibilities under section 202 of  
6 the Energy Research, Development, Demonstration,  
7 and Commercial Application Act of 2003, and any  
8 final determination of the Commission relating to  
9 whether a nonmilitary energy laboratory owned or  
10 operated by the Department is in compliance with  
11 such standards and all applicable Commission regu-  
12 lations or orders.”.

13           (7) EMPLOYEE PROTECTION.—Any Department  
14 contractor operating a nonmilitary energy laboratory  
15 that is regulated by the Nuclear Regulatory Com-  
16 mission under this section shall be subject to section  
17 211 of the Energy Reorganization Act of 1974 (42  
18 U.S.C. 5851) to the same extent as any other em-  
19 ployer subject to such section 211.

20           (8) CONFLICT OF INTEREST.—Section 170A of  
21 the Atomic Energy Act of 1954 (42 U.S.C. 2210a)  
22 applies to contracts, agreements, or other arrange-  
23 ments of the Nuclear Regulatory Commission pro-  
24 posed or entered into pursuant to its responsibilities  
25 assumed under this subsection.

1 (c) OCCUPATIONAL SAFETY AND HEALTH.—

2 (1) OSHA JURISDICTION.—Notwithstanding  
3 section 4(b)(1) of the Occupational Safety and  
4 Health Act of 1970 (29 U.S.C. 653(b)(1)), effective  
5 2 years after the date of enactment of this Act, the  
6 Occupational Safety and Health Administration shall  
7 assume the exclusive regulatory and enforcement re-  
8 sponsibilities of the Department relating to matters  
9 covered by the Occupational Safety and Health Act  
10 of 1970 with regard to all nonmilitary energy lab-  
11 oratories owned or operated by the Department, ex-  
12 cept as provided in paragraph (2). The responsibil-  
13 ities assumed by the Occupational Safety and Health  
14 Administration under this subsection shall be admin-  
15 istered by the Occupational Safety and Health Ad-  
16 ministration, not by States. Any Department con-  
17 tractor operating such a laboratory shall, with re-  
18 spect to matters relating to occupational safety and  
19 health, be considered to be an employer for purposes  
20 of the Occupational Safety and Health Act of 1970.

21 (2) REGULATION OF HAZARDS CONTAINING RA-  
22 DIOLOGICAL AND NON-RADIOLOGICAL COMPO-  
23 NENT.—If a hazard at a nonmilitary energy labora-  
24 tory owned or operated by the Department presents  
25 a risk of occupational exposure and contains both a

1 radiological and non-radiological component, the Oc-  
2 cupational Safety and Health Administration and  
3 the Nuclear Regulatory Commission shall, effective 2  
4 years after the date of enactment of this Act, share  
5 regulatory and enforcement responsibilities with re-  
6 spect to the hazard in accordance with the memo-  
7 randum of understanding entered into pursuant to  
8 subsection (d).

9 (d) MEMORANDUM OF UNDERSTANDING.—The Nu-  
10 clear Regulatory Commission and the Occupational Safety  
11 and Health Administration shall, not later than 1 year  
12 after the date of enactment of this Act, enter into and  
13 transmit to the Congress a memorandum of under-  
14 standing to govern the exercise of their respective authori-  
15 ties over nuclear safety and occupational safety and health  
16 at nonmilitary energy laboratories owned or operated by  
17 the Department.

18 (e) CIVIL PENALTIES.—The Department's contractor  
19 operating a nonmilitary energy laboratory owned or oper-  
20 ated by the Department shall not be liable for civil pen-  
21 alties under the Atomic Energy Act of 1954 or the Occu-  
22 pational Safety and Health Act of 1970 for any actions  
23 taken before the date of transfer of regulatory authority  
24 under this section, pursuant to the instructions of a Fed-

1 eral agency in preparation for the transfer of regulatory  
2 and enforcement responsibilities required by this section.

3 (f) INDEMNIFICATION.—The Secretary shall continue  
4 to indemnify nonmilitary energy laboratories owned or op-  
5 erated by the Department in accordance with the provi-  
6 sions of section 170 d. of the Atomic Energy Act of 1954.

7 (g) DEPARTMENT OF ENERGY REPORTING REQUIRE-  
8 MENT.—Not later than 18 months after the date of enact-  
9 ment of this Act, the Secretary shall transmit to the Con-  
10 gress a plan for the termination of the Department's regu-  
11 latory and enforcement responsibilities for nonmilitary en-  
12 ergy laboratories owned or operated by the Department  
13 required by this section. The report shall include—

14 (1) a detailed transition plan, drafted in coordi-  
15 nation with the Nuclear Regulatory Commission and  
16 the Occupational Safety and Health Administration,  
17 giving the schedule for termination of self-regulation  
18 authority as outlined in subsection (a), including the  
19 activities to be coordinated with the Nuclear Regu-  
20 latory Commission and the Occupational Safety and  
21 Health Administration;

22 (2) a description of any issues remaining to be  
23 resolved with the Nuclear Regulatory Commission,  
24 the Occupational Safety and Health Administration,  
25 or other external regulators, and a timetable for re-

8

1 solving such issues by the authority transfer date es-  
2 tablished under this section; and

3 (3) an estimate of—

4 (A) the annual cost of administering and  
5 implementing self-regulation of the nuclear  
6 safety and occupational safety and health re-  
7 sponsibilities described in subsections (b) and  
8 (e) at nonmilitary energy laboratories owned or  
9 operated by the Department;

10 (B) the number of Federal and contractor  
11 employees administering and implementing such  
12 self-regulation; and

13 (C) the extent and schedule by which the  
14 Department and the staffs at its nonmilitary  
15 energy laboratories will be reduced as a result  
16 of implementation of this section.

17 (h) GENERAL ACCOUNTING OFFICE REPORTING RE-  
18 QUIREMENT.—The Comptroller General of the United  
19 States shall periodically report to the Congress on the  
20 progress made in implementing this section. The Comp-  
21 troller General shall provide a report not later than 20  
22 months after the date of enactment of this Act on the De-  
23 partment's transition plan, and not later than 26 months  
24 after the date of enactment of this Act on the implementa-  
25 tion of Nuclear Regulatory Commission and Occupational

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- 1 Safety and Health Administration regulations in the non-
- 2 military energy laboratories.

**AMENDMENTS TO H.R. 238**  
**OFFERED BY MRS. BIGGERT AND MR. DAVIS OF**  
**TENNESSEE**

Page 93, line 22, redesignate subsection (c) as subsection (d).

Page 93, after line 21, insert the following:

- 1           (4) GENOMES TO LIFE.—
- 2                 (A) TOTAL AUTHORIZATION.—For activi-
- 3                 ties under section 170A—
- 4                     (i) \$100,000,000 for fiscal year 2004;
- 5                     and
- 6                     (ii) such sums as may be necessary
- 7                     for fiscal years 2005 through 2007.
- 8                 (B) USER FACILITIES AND ANCILLARY
- 9                 EQUIPMENT.—From the amounts authorized
- 10                 under subparagraph (A), the following sums are
- 11                 authorized to be appropriated to carry out sec-
- 12                 tion 170A(e)—
- 13                     (i) \$16,000,000 for fiscal year 2004;
- 14                     and
- 15                     (ii) such sums as may be necessary
- 16                     for fiscal years 2005 through 2007.

Page 104, after line 24, add the following new part:

1                   **PART 5—GENOMES TO LIFE**2   **SEC. 170A. GENOMES TO LIFE.**

3       (a) FINDINGS.—The Congress finds the following:

4           (1) The Department's Genomes to Life initia-  
5       tive involves the emerging fields of systems biology  
6       and proteomics, which address the ability to under-  
7       stand the composition and function of the bio-  
8       chemical networks and pathways that carry out the  
9       essential processes of living organisms.10          (2) The Genomes to Life initiative builds on the  
11       Department's integral role in the Human Genome  
12       Project, which has led to the mapping, sequencing,  
13       and identification of genetic material. Genomes to  
14       Life will go beyond mapping to develop an under-  
15       standing of how genetic components interact to per-  
16       form cellular activities vital to life.17          (3) The ability of the United States to respond  
18       to the national security, energy, and environmental  
19       challenges of the 21st century will be driven by  
20       science and technology. An integrated and predictive  
21       understanding of biological systems will enable the  
22       United States to develop new technologies related to  
23       the detection of biological and chemical agents, en-  
24       ergy production, carbon sequestration, bioremedi-  
25       ation, and other Department statutory missions.  
26       These advances will also enhance the strength of

1 United States science, technology, and medicine gen-  
2 erally.

3 (4) The fundamental intellectual challenges in-  
4 herent in the Genomes to Life initiative are consid-  
5 erable, and require public support for basic and ap-  
6 plied research and development. Significant advances  
7 in areas such as the characterization of multiprotein  
8 complexes and gene regulatory networks will be re-  
9 quired before biologically-based solutions and tech-  
10 nologies will be useful in national security applica-  
11 tions, as well as to the energy, medical, and agricul-  
12 tural industries.

13 (5) The development of new scientific instru-  
14 ments will also be required to advance Genomes to  
15 Life research. Such instruments are likely to be  
16 large and costly. Specialized facilities are also likely  
17 to be required in order to advance the field and to  
18 realize its promise. Such facilities will be sufficiently  
19 expensive that they will have to be located and con-  
20 structed on a centralized basis, similar to a number  
21 of unique facilities already managed by the Depart-  
22 ment.

23 (6) Contributions from individual researchers as  
24 well as multidisciplinary research teams will be re-  
25 quired to advance systems biology and proteomics.

1           (7) The Department's Office of Science is well  
2           suited to manage systems biology and proteomics re-  
3           search for the Department. Through its support of  
4           research and development pursuant to the Depart-  
5           ment's statutory authorities, the Office of Science is  
6           the principal Federal supporter of research and de-  
7           velopment in the physical and computational  
8           sciences. The Office is also a significant source of  
9           Federal support for research in genomics and the  
10          life sciences. The Office supports research and devel-  
11          opment by individual investigators and multidisci-  
12          plinary teams, and manages special user facilities  
13          that serve investigators in both university and indus-  
14          try.

15          (b) ESTABLISHMENT OF PROGRAM.—The Secretary  
16          shall carry out a program of research, development, dem-  
17          onstration, and commercial application, to be known as  
18          the Genomes to Life Program, in systems biology and  
19          proteomics.

20          (c) PLANNING.—

21               (1) IN GENERAL.—Within one year after the  
22               date of enactment of this Act, the Secretary shall  
23               prepare and transmit to Congress a Program plan  
24               describing how knowledge and capabilities would be  
25               developed by the Program and applied to Depart-

1       ment missions relating to energy, environmental  
2       cleanup, and stabilization of atmospheric levels of  
3       carbon dioxide.

4           (2) CONSULTATION.—The Program plan will be  
5       developed in consultation with other relevant De-  
6       partment technology programs and other relevant  
7       Federal agencies.

8           (3) LONG-TERM GOALS.—The Program plan  
9       shall focus science and technology on long-term  
10      goals including—

11           (A) contributing to United States inde-  
12      pendence from foreign energy sources;

13           (B) stabilizing atmospheric levels of carbon  
14      dioxide;

15           (C) advancing environmental cleanup; and

16           (D) providing the science and technology  
17      basis for new industries in biotechnology.

18           (4) SPECIFIC GOALS.—The Program plan shall  
19      identify appropriate research, development, dem-  
20      onstration, and commercial application activities to  
21      address the following issues within the next decade:

22           (A) Identifying new biological sources of  
23      fuels and electricity, with particular emphasis  
24      on creating biological technologies for the pro-  
25      duction and utilization of hydrogen.

1 (B) Understanding the Earth's natural  
2 carbon cycle and creating strategies to stabilize  
3 atmospheric carbon dioxide.

4 (C) Developing a knowledge and capability  
5 base for exploring more cost-effective cleanup  
6 strategies for Department sites.

7 (D) Capturing key biological processes in  
8 engineered systems not requiring living cells.

9 (5) REVIEW.—The Secretary shall enter into an  
10 arrangement with the National Academy of Sciences  
11 to review the plan developed under this subsection.  
12 The Secretary shall transmit the review to the Con-  
13 gress not later than 6 months after the transmittal  
14 of the Program plan under paragraph (1), along  
15 with an explanation of any differences between the  
16 plan and the recommendations of the Academy.

17 (d) PROGRAM EXECUTION.—In carrying out the Pro-  
18 gram under this section, the Secretary shall—

19 (1) support individual investigators and multi-  
20 disciplinary teams of investigators;

21 (2) subject to subsection (e), develop, plan, con-  
22 struct, acquire, or operate special equipment or fa-  
23 cilities for the use of investigators conducting re-  
24 search, development, demonstration, or commercial  
25 application in systems biology and proteomics;

1 (3) support technology transfer activities to  
2 benefit industry and other users of systems biology  
3 and proteomics; and

4 (4) coordinate activities by the Department  
5 with academia, industry, and other Federal agencies.

6 (e) USER FACILITIES AND ANCILLARY EQUIP-  
7 MENT.—

8 (1) FACILITIES.—As part of the Genomes to  
9 Life Program, the Secretary is authorized to de-  
10 velop, plan, construct, acquire, or operate special  
11 equipment, instrumentation, or facilities for inves-  
12 tigators conducting research, development, dem-  
13 onstration, and commercial application projects in  
14 systems biology and proteomics and associated bio-  
15 logical disciplines.

16 (2) PROJECTS.—Projects referred to in para-  
17 graph (1) may include—

18 (A) the identification and characterization  
19 of multiprotein complexes;

20 (B) characterization of gene regulatory  
21 networks;

22 (C) characterization of the functional rep-  
23 ertoire of complex microbial communities in  
24 their natural environments at the molecular  
25 level; and

1 (D) development of computational methods  
2 and capabilities to advance understanding of  
3 complex biological systems and predict their be-  
4 havior.

5 (3) FACILITIES.—Facilities supported under  
6 paragraph (1) may include facilities for—

7 (A) the production and characterization of  
8 proteins;

9 (B) whole proteome analysis;

10 (C) characterization and imaging of molec-  
11 ular machines; and

12 (D) analysis and modeling of cellular sys-  
13 tems.

14 (4) COLLABORATION.—The Secretary shall en-  
15 courage collaborations among universities, labora-  
16 tories, and industry at facilities supported under this  
17 subsection. All facilities supported under this sub-  
18 section shall have a specific mission of technology  
19 transfer to other institutions.

20 (f) DEFINITIONS.—For purposes of this section:

21 (1) PROGRAM.—The term “Program” means  
22 the Genomes to Life Program carried out under this  
23 section.

24 (2) PROTEOMICS.—The term “proteomics”  
25 means the determination of the structure, function,

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1 and expression of the proteins encoded in any ge-  
2 nome, including new protein sequences encoded in a  
3 genome for which the structural or functional cor-  
4 relates are not currently known.

**AMENDMENT TO H.R. 238**  
**OFFERED BY MR. ROHRABACHER**

Page 93, after line 21, insert the following new paragraph:

- 1           (4) SCIENCE AND TECHNOLOGY SCHOLARSHIP  
2           PROGRAM.—For activities under section 170A—  
3           (A) for fiscal year 2004, \$800,000;  
4           (B) for fiscal year 2005, \$1,600,000;  
5           (C) for fiscal year 2006, \$2,000,000; and  
6           (D) for fiscal year 2007, \$2,000,000.

Page 104, after line 24, insert the following new section:

- 7   **SEC. 170A. DEPARTMENT OF ENERGY SCIENCE AND TECH-**  
8           **NOLOGY SCHOLARSHIP PROGRAM.**  
9           (a) ESTABLISHMENT OF PROGRAM.—  
10           (1) IN GENERAL.—The Secretary shall establish  
11           a Department of Energy Science and Technology  
12           Scholarship Program to award scholarships to indi-  
13           viduals that is designed to recruit and prepare stu-  
14           dents for careers in the Department.  
15           (2) COMPETITIVE PROCESS.—Individuals shall  
16           be selected to receive scholarships under this section  
17           through a competitive process primarily on the basis  
18           of academic merit, with consideration given to finan-

1       cial need and the goal of promoting the participation  
2       of individuals identified in section 33 or 34 of the  
3       Science and Engineering Equal Opportunities Act  
4       (42 U.S.C. 1885a or 1885b).

5       (3) SERVICE AGREEMENTS.—To carry out the  
6       Program the Secretary shall enter into contractual  
7       agreements with individuals selected under para-  
8       graph (2) under which the individuals agree to serve  
9       as full-time employees of the Department, for the  
10      period described in subsection (f)(1), in positions  
11      needed by the Department and for which the individ-  
12      uals are qualified, in exchange for receiving a schol-  
13      arship.

14      (b) SCHOLARSHIP ELIGIBILITY.—In order to be eligi-  
15      ble to participate in the Program, an individual must—

16      (1) be enrolled or accepted for enrollment as a  
17      full-time student at an institution of higher edu-  
18      cation in an academic program or field of study de-  
19      scribed in the list made available under subsection  
20      (d);

21      (2) be a United States citizen; and

22      (3) at the time of the initial scholarship award,  
23      not be a Federal employee as defined in section  
24      2105 of title 5 of the United States Code.

1 (c) APPLICATION REQUIRED.—An individual seeking  
2 a scholarship under this section shall submit an applica-  
3 tion to the Secretary at such time, in such manner, and  
4 containing such information, agreements, or assurances as  
5 the Secretary may require.

6 (d) ELIGIBLE ACADEMIC PROGRAMS.—The Secretary  
7 shall make publicly available a list of academic programs  
8 and fields of study for which scholarships under the Pro-  
9 gram may be utilized, and shall update the list as nec-  
10 essary.

11 (e) SCHOLARSHIP REQUIREMENT.—

12 (1) IN GENERAL.—The Secretary may provide a  
13 scholarship under the Program for an academic year  
14 if the individual applying for the scholarship has  
15 submitted to the Secretary, as part of the applica-  
16 tion required under subsection (c), a proposed aca-  
17 demic program leading to a degree in a program or  
18 field of study on the list made available under sub-  
19 section (d).

20 (2) DURATION OF ELIGIBILITY.—An individual  
21 may not receive a scholarship under this section for  
22 more than 4 academic years, unless the Secretary  
23 grants a waiver.

24 (3) SCHOLARSHIP AMOUNT.—The dollar  
25 amount of a scholarship under this section for an

1 academic year shall be determined under regulations  
2 issued by the Secretary, but shall in no case exceed  
3 the cost of attendance.

4 (4) AUTHORIZED USES.—A scholarship pro-  
5 vided under this section may be expended for tuition,  
6 fees, and other authorized expenses as established by  
7 the Secretary by regulation.

8 (5) CONTRACTS REGARDING DIRECT PAYMENTS  
9 TO INSTITUTIONS.—The Secretary may enter into a  
10 contractual agreement with an institution of higher  
11 education under which the amounts provided for a  
12 scholarship under this section for tuition, fees, and  
13 other authorized expenses are paid directly to the in-  
14 stitution with respect to which the scholarship is  
15 provided.

16 (f) PERIOD OF OBLIGATED SERVICE.—

17 (1) DURATION OF SERVICE.—The period of  
18 service for which an individual shall be obligated to  
19 serve as an employee of the Department is, except  
20 as provided in subsection (h)(2), 24 months for each  
21 academic year for which a scholarship under this  
22 section is provided.

23 (2) SCHEDULE FOR SERVICE.—(A) Except as  
24 provided in subparagraph (B), obligated service  
25 under paragraph (1) shall begin not later than 60

1 days after the individual obtains the educational de-  
2 gree for which the scholarship was provided.

3 (B) The Secretary may defer the obligation of  
4 an individual to provide a period of service under  
5 paragraph (1) if the Secretary determines that such  
6 a deferral is appropriate. The Secretary shall pre-  
7 scribe the terms and conditions under which a serv-  
8 ice obligation may be deferred through regulation.

9 (g) PENALTIES FOR BREACH OF SCHOLARSHIP  
10 AGREEMENT.—

11 (1) FAILURE TO COMPLETE ACADEMIC TRAIN-  
12 ING.—Scholarship recipients who fail to maintain a  
13 high level of academic standing, as defined by the  
14 Secretary by regulation, who are dismissed from  
15 their educational institutions for disciplinary rea-  
16 sons, or who voluntarily terminate academic training  
17 before graduation from the educational program for  
18 which the scholarship was awarded, shall be in  
19 breach of their contractual agreement and, in lieu of  
20 any service obligation arising under such agreement,  
21 shall be liable to the United States for repayment  
22 within 1 year after the date of default of all scholar-  
23 ship funds paid to them and to the institution of  
24 higher education on their behalf under the agree-  
25 ment, except as provided in subsection (h)(2). The

1        repayment period may be extended by the Secretary  
2        when determined to be necessary, as established by  
3        regulation.

4            (2) FAILURE TO BEGIN OR COMPLETE THE  
5        SERVICE OBLIGATION OR MEET THE TERMS AND  
6        CONDITIONS OF DEFERMENT.—Scholarship recipi-  
7        ents who, for any reason, fail to begin or complete  
8        their service obligation after completion of academic  
9        training, or fail to comply with the terms and condi-  
10       tions of deferment established by the Secretary pur-  
11       suant to subsection (f)(2)(B), shall be in breach of  
12       their contractual agreement. When recipients breach  
13       their agreements for the reasons stated in the pre-  
14       ceding sentence, the recipient shall be liable to the  
15       United States for an amount equal to—

16            (A) the total amount of scholarships re-  
17        ceived by such individual under this section;  
18        plus

19            (B) the interest on the amounts of such  
20        awards which would be payable if at the time  
21        the awards were received they were loans bear-  
22        ing interest at the maximum legal prevailing  
23        rate, as determined by the Treasurer of the  
24        United States,

25        multiplied by 3.

1 (h) WAIVER OR SUSPENSION OF OBLIGATION.—

2 (1) DEATH OF INDIVIDUAL.—Any obligation of  
3 an individual incurred under the Program (or a con-  
4 tractual agreement thereunder) for service or pay-  
5 ment shall be canceled upon the death of the indi-  
6 vidual.

7 (2) IMPOSSIBILITY OR EXTREME HARDSHIP.—

8 The Secretary shall by regulation provide for the  
9 partial or total waiver or suspension of any obliga-  
10 tion of service or payment incurred by an individual  
11 under the Program (or a contractual agreement  
12 thereunder) whenever compliance by the individual is  
13 impossible or would involve extreme hardship to the  
14 individual, or if enforcement of such obligation with  
15 respect to the individual would be contrary to the  
16 best interests of the Government.

17 (i) DEFINITIONS.—In this section the following defi-  
18 nitions apply:

19 (1) COST OF ATTENDANCE.—The term “cost of  
20 attendance” has the meaning given that term in sec-  
21 tion 472 of the Higher Education Act of 1965 (20  
22 U.S.C. 1087U).

23 (2) INSTITUTION OF HIGHER EDUCATION.—The  
24 term “institution of higher education” has the

1 meaning given that term in section 101(a) of the  
2 Higher Education Act of 1965 (20 U.S.C. 1001(a)).

3 (3) PROGRAM.—The term “Program” means  
4 the Department of Energy Science and Technology  
5 Scholarship Program established under this section.

**AMENDMENT TO H.R. 238**  
**OFFERED BY MS. JACKSON-LEE OF TEXAS**

Page 126, after line 2, insert the following new section:

1 **SEC. 193. INTERAGENCY COOPERATION.**

2     The Secretary shall enter into discussions with the  
3 Administrator of the National Aeronautics and Space Ad-  
4 ministration with the goal of reaching an interagency  
5 working agreement between the 2 agencies that would  
6 make the National Aeronautics and Space Administra-  
7 tion's expertise in energy, gained from its existing and  
8 planned programs, more readily available to the relevant  
9 research, development, demonstration, and commercial ap-  
10 plications programs of the Department. Technologies to  
11 be discussed should include the National Aeronautics and  
12 Space Administration's modeling, research, development,  
13 testing, and evaluation of new energy technologies, includ-  
14 ing solar, wind, fuel cells, and hydrogen storage and dis-  
15 tribution.

AMENDMENT TO H.R. 238  
OFFERED BY MR. UDALL (CO)

At the end of the bill insert the following:

Title VI -- GLOBAL CHANGE RESEARCH AND DATA  
MANAGEMENT

1 **SUBTITLE I—GLOBAL CHANGE**  
2 **RESEARCH**

3 **SEC. 101. FINDINGS AND PURPOSE.**

4 (a) **FINDINGS.**—The Congress makes the following  
5 findings:

6 (1) Industrial, agricultural, and other human  
7 activities, coupled with an expanding world popu-  
8 lation, are contributing to processes of global change  
9 that are significantly altering the Earth habitat.

10 (2) Such human-induced changes, in conjunc-  
11 tion with natural fluctuations, may lead to signifi-  
12 cant alterations of world climate patterns. Over the  
13 next century, these changes could adversely effect  
14 world agricultural and marine production, coastal  
15 habitability, biological diversity, human health, glob-  
16 al social and political stability, and global economic  
17 activity.

18 (3) Developments in interdisciplinary Earth  
19 sciences, global observing systems, and satellite and  
20 computing technologies make possible significant sci-  
21 entific understanding of global changes and their ef-  
22 fects, and have resulted in the significant expansion  
23 of environmental data and information.

24 (4) Development of effective policies to prevent,  
25 mitigate, and adapt to global change will rely on im-



1       provement in scientific understanding of global envi-  
2       ronmental processes and on development of informa-  
3       tion that is of use to decisionmakers at the local, re-  
4       gional, and national levels.

5           (5) Although the United States Global Change  
6       Research Program has made significant contribu-  
7       tions to understanding Earth's climate and the an-  
8       thropogenic influences on Earth's climate and its  
9       ecosystems, that Program has not produced suffi-  
10      cient information to meet the expressed needs of de-  
11      cisionmakers.

12          (6) Predictions of future climate conditions for  
13      specific regions have considerable uncertainty and  
14      are unlikely to be confirmed in a time period nec-  
15      essary to inform decisions on land, water, and re-  
16      source management. However, improved under-  
17      standing of global change should be used to assist  
18      decisionmakers in the development of policies to en-  
19      sure that ecological, social, and economic systems  
20      are resilient under a variety of plausible climate fu-  
21      tures.

22          (7) In order to most effectively meet the needs  
23      of decisionmakers, both the research agenda of the  
24      United States Global Change Research Program and  
25      its implementation must be informed by continuous



1 feedback from documented users of information gen-  
2 erated by the Program.

3 (b) PURPOSE.—The purpose of this title is to provide  
4 for the continuation and coordination of a comprehensive  
5 and integrated United States observation and research  
6 program which will assist the Nation and the world to un-  
7 derstand, assess, predict, and respond to the effects of  
8 human-induced and natural processes of global change.

9 SEC. 102. DEFINITIONS.

10 For purposes of this title—

11 (1) the term “global change” means human-in-  
12 duced or natural changes in the global environment  
13 (including alterations in climate, land productivity,  
14 oceans or other water resources, atmospheric chem-  
15 istry, biodiversity, and ecological systems) that may  
16 alter the capacity of the Earth to sustain life;

17 (2) the term “global change research” means  
18 study, monitoring, assessment, prediction, and infor-  
19 mation management activities to describe and  
20 understand—

21 (A) the interactive physical, chemical, and  
22 biological processes that regulate the total  
23 Earth system;

24 (B) the unique environment that the Earth  
25 provides for life;



1 (C) changes that are occurring in the  
2 Earth system; and

3 (D) the manner in which such system, en-  
4 vironment, and changes are influenced by  
5 human actions;

6 (3) the term "interagency committee" means  
7 the interagency committee established under section  
8 103;

9 (4) the term "Plan" means the National Global  
10 Change Research Plan developed under section 105;  
11 and

12 (5) the term "Program" means the United  
13 States Global Change Research Program established  
14 under section 104.

15 **SEC. 103. INTERAGENCY COOPERATION AND COORDINA-**  
16 **TION.**

17 (a) **ESTABLISHMENT.**—The President shall establish  
18 an interagency committee to ensure cooperation and co-  
19 ordination of all Federal research activities pertaining to  
20 processes of global change for the purpose of increasing  
21 the overall effectiveness and productivity of Federal global  
22 change research efforts. The interagency committee shall  
23 include representatives of both agencies conducting global  
24 change research and agencies with authority over re-  
25 sources likely to be affected by global change.



1 (b) FUNCTIONS OF THE INTERAGENCY COM-  
2 MITTEE.—The interagency committee shall—

3 (1) serve as the forum for developing the Plan  
4 and for overseeing its implementation;

5 (2) serve as the forum for developing the vul-  
6 nerability assessment under section 107;

7 (3) ensure cooperation among Federal agencies  
8 with respect to global change research activities;

9 (4) work with academic, State, industry, and  
10 other groups conducting global change research, to  
11 provide for periodic public and peer review of the  
12 Program;

13 (5) cooperate with the Secretary of State in—

14 (A) providing representation at inter-  
15 national meetings and conferences on global  
16 change research in which the United States  
17 participates; and

18 (B) coordinating the Federal activities of  
19 the United States with programs of other na-  
20 tions and with international global change re-  
21 search activities;

22 (6) work with appropriate Federal, State, re-  
23 gional, and local authorities to ensure that the Pro-  
24 gram is designed to produce information needed to  
25 develop policies to reduce the vulnerability of the

1 United States and other regions to global change;  
2 and

3 (7) identify additional decisionmaking groups  
4 that may use information generated through the  
5 Program.

6 **SEC. 104. UNITED STATES GLOBAL CHANGE RESEARCH**  
7 **PROGRAM.**

8 The President shall establish an interagency United  
9 States Global Change Research Program to improve un-  
10 derstanding of global change, to respond to the informa-  
11 tion needs of communities and decisionmakers, and to pro-  
12 vide periodic assessments of the vulnerability of the United  
13 States and other regions to global change. The Program  
14 shall be implemented in accordance with the Plan.

15 **SEC. 105. NATIONAL GLOBAL CHANGE RESEARCH PLAN.**

16 (a) **IN GENERAL.**—The President shall develop a Na-  
17 tional Global Change Research Plan for implementation  
18 of the Program. The Plan shall contain recommendations  
19 for global change research. The President shall submit the  
20 Plan to the Congress within 1 year after the date of enact-  
21 ment of this Act, and shall submit a revised Plan at least  
22 once every 4 years thereafter. In the development of each  
23 Plan, the President shall conduct a formal assessment  
24 process to determine the needs of appropriate Federal,  
25 State, regional, and local authorities and other interested



1 parties regarding the types of information needed by them  
2 in developing policies to reduce society's vulnerability to  
3 global change and shall utilize these assessments in devel-  
4 oping the Plan.

5 (b) CONTENTS OF THE PLAN.—The Plan shall—

6 (1) establish, for the 10-year period beginning  
7 in the year the Plan is submitted, the goals and pri-  
8 orities for Federal global change research which  
9 most effectively advance scientific understanding of  
10 global change and provide information of use to  
11 Federal, State, regional, and local authorities in the  
12 development of policies relating to global change;

13 (2) describe specific activities, including efforts  
14 to determine user information needs, research activi-  
15 ties, data collection and data analysis requirements,  
16 assessment of model predictability, participation in  
17 international research efforts, and information man-  
18 agement, required to achieve such goals and prior-  
19 ities;

20 (3) identify relevant programs and activities of  
21 the Federal agencies that contribute to the Program  
22 directly and indirectly;

23 (4) set forth the role of each Federal agency in  
24 implementing the Plan;



1 (5) consider and utilize, as appropriate, reports  
2 and studies conducted by Federal agencies, the Na-  
3 tional Research Council, or other entities;

4 (6) make recommendations for the coordination  
5 of the global change research activities of the United  
6 States with such activities of other nations and  
7 international organizations, including—

8 (A) a description of the extent and nature  
9 of international cooperative activities;

10 (B) bilateral and multilateral efforts to  
11 provide worldwide access to scientific data and  
12 information; and

13 (C) improving participation by developing  
14 nations in international global change research  
15 and environmental data collection;

16 (7) detail budget requirements for Federal glob-  
17 al change research activities to be conducted under  
18 the Plan;

19 (8) catalog the type of information identified by  
20 appropriate Federal, State, regional, and local deci-  
21 sionmakers needed to develop policies to reduce soci-  
22 ety's vulnerability to global change and indicate how  
23 the planned research will meet these decisionmakers'  
24 information needs; and



10

1 (9) identify the observing systems currently em-  
2 ployed in collecting data relevant to global change  
3 research and prioritize additional observation sys-  
4 tems that may be needed to ensure adequate data  
5 collection and monitoring of global change.

6 (c) RESEARCH ELEMENTS.—The Plan shall include  
7 at a minimum the following research elements:

8 (1) Global measurements, establishing world-  
9 wide to regional scale observations prioritized to un-  
10 derstand global change and to meet the information  
11 needs of decisionmakers on all relevant spatial and  
12 time scales.

13 (2) Information on economic and demographic  
14 trends that contribute to changes in the Earth sys-  
15 tem and that influence society's vulnerability to  
16 global change.

17 (3) Development of indicators and baseline  
18 databases to document global change, including  
19 changes in species distribution and behavior, extent  
20 of glaciations, and changes in sea level.

21 (4) Studies of historical changes in the Earth  
22 system, using evidence from the geological and fossil  
23 record.



1           (5) Assessments of predictability using quan-  
2 titative models of the Earth system to simulate glob-  
3 al and regional environmental processes and trends.

4           (6) Focused research initiatives to understand  
5 the nature of and interaction among physical, chem-  
6 ical, biological, and social processes related to global  
7 change.

8           (7) Focused research initiatives to determine  
9 and then meet the information needs of appropriate  
10 Federal, State, and regional decisionmakers.

11       (d) INFORMATION MANAGEMENT.—The Plan shall  
12 incorporate, to the extent practicable, the recommenda-  
13 tions relating to data acquisition, management, and  
14 archiving made by the interagency climate and other glob-  
15 al change data management working group established  
16 under section 203.

17       (e) NATIONAL ACADEMY OF SCIENCES EVALUA-  
18 TION.—The President shall enter into an agreement with  
19 the National Academy of Sciences under which the Acad-  
20 emy shall—

21           (1) evaluate the scientific content of the Plan;  
22           and  
23           (2) recommend priorities for future global  
24           change research.



1 (f) NATIONAL GOVERNORS ASSOCIATION EVALUA-  
2 TION.—The President shall seek to enter into an agree-  
3 ment with the National Governors Association Center for  
4 Best Practices under which that Center shall—

5 (1) evaluate the utility to State, local, and re-  
6 gional decisionmakers of each Plan and of the antici-  
7 pated and actual information outputs of the Pro-  
8 gram for development of policies to reduce vulner-  
9 ability to global change; and

10 (2) recommend priorities for future global  
11 change research.

12 (g) PUBLIC PARTICIPATION.—In developing the  
13 Plan, the President shall consult with academic, State, in-  
14 dustry, and environmental groups and representatives.  
15 Not later than 90 days before the President submits the  
16 Plan, or any revision thereof, to the Congress, a summary  
17 of the proposed Plan shall be published in the Federal  
18 Register for a public comment period of not less than 60  
19 days.

20 **SEC. 106. BUDGET COORDINATION.**

21 (a) IN GENERAL.—The President shall provide gen-  
22 eral guidance to each Federal agency participating in the  
23 Program with respect to the preparation of requests for  
24 appropriations for activities related to the Program.



1 (b) CONSIDERATION IN PRESIDENT'S BUDGET.—The  
2 President shall identify in each annual budget request sub-  
3 mitted to the Congress under section 1105 of title 31,  
4 United States Code, those items in each agency's annual  
5 budget which are elements of the Program.

6 SEC. 107. VULNERABILITY ASSESSMENT.

7 Within 1 year after the date of enactment of this Act,  
8 and at least once every 4 years thereafter, the President  
9 shall submit to the Congress an assessment which—

10 (1) integrates, evaluates, and interprets the  
11 findings of the Program and discusses the scientific  
12 uncertainties associated with such findings;

13 (2) based on indicators and baselines developed  
14 under section 105(c)(3), as well as other measure-  
15 ments, analyzes changes to the natural environment,  
16 land and water resources, and biological diversity  
17 in—

18 (A) major geographic regions of the United  
19 States; and

20 (B) other continents;

21 (3) analyzes the effects of global change, includ-  
22 ing the changes described in paragraph (2), on agri-  
23 culture, energy production and use, transportation,  
24 human health and welfare, and human social and  
25 economic systems, including providing information



14

1 about the differential impacts on specific geographic  
2 regions within the United States, on people of dif-  
3 ferent income levels within those regions, and for  
4 rural and urban areas within those regions;

5 (4) analyzes the vulnerability of different geo-  
6 graphic regions of the world to global change, in-  
7 cluding analyses of the implications of global change  
8 for international assistance, population displacement,  
9 and national security; and

10 (5) analyzes the adoption rates of policies and  
11 technologies available to reduce the vulnerability of  
12 society to global change with an evaluation of the  
13 market and policy barriers suppressing their adop-  
14 tion in the United States.

15 **SEC. 108. POLICY ASSESSMENT.**

16 Not later than 1 year after the date of enactment  
17 of this Act, and at least once every 3 years thereafter,  
18 the President shall submit to the Congress a policy assess-  
19 ment which—

20 (1) documents current policy options being uti-  
21 lized by Federal, State, and local governments to  
22 mitigate or adapt to the effects of global change;

23 (2) evaluates the realized and anticipated effec-  
24 tiveness of those current policy options in addressing  
25 global change; and



1 (3) identifies and evaluates additional policy op-  
2 tions for mitigating or adapting to the effects of  
3 global change.

4 **SEC. 109. ANNUAL REPORT.**

5 Each year at the time of submission to the Congress  
6 of the President's budget request, the President shall sub-  
7 mit to the Congress a report on the activities conducted  
8 pursuant to this title, including—

9 (1) a summary of the achievements of the Pro-  
10 gram during the period covered by the report;

11 (2) an analysis of the progress made toward  
12 achieving the goals of the Plan; and

13 (3) a list of the State, local, and regional deci-  
14 sionmakers identified as potential users of the infor-  
15 mation generated through the Program and a de-  
16 scription of the consultations with this community  
17 coordinated through the work of the interagency  
18 committee.

19 **SEC. 110. RELATION TO OTHER AUTHORITIES.**

20 The President shall ensure that relevant research ac-  
21 tivities of the National Climate Program, established by  
22 the National Climate Program Act (15 U.S.C. 2901 et  
23 seq.), are considered in developing national global change  
24 research efforts.



1 SEC. 111. REPEAL.

2 The Global Change Research Act of 1990 (15 U.S.C.  
3 2921 et seq.) is repealed.

4 **SUBTITLE II—CLIMATE AND OTHER**  
5 **GLOBAL CHANGE DATA MAN-**  
6 **AGEMENT**

7 SEC. 201. FINDINGS AND PURPOSES.

8 (a) FINDINGS.—The Congress makes the following  
9 findings:

10 (1) Federal agencies have a primary mission to  
11 manage and archive climate and other global change  
12 data obtained through their research, development,  
13 or operational activities.

14 (2) Maintenance of climate and global change  
15 data records is essential to present and future stud-  
16 ies of the Earth's atmosphere, biogeochemical cycles,  
17 and climate.

18 (3) Federal capabilities for the management  
19 and archiving of these data have not kept pace with  
20 advances in satellite and other observational tech-  
21 nologies that have vastly expanded the type and  
22 amount of information that can be collected.

23 (4) Proposals and plans for expansion of global  
24 observing networks should include plans for the  
25 management of data to be collected and budgets re-



1 reflecting the cost of support for management and  
2 archiving of data.

3 (b) PURPOSES.—The purposes of this title are to es-  
4 tablish climate and other global change data management  
5 and archiving as Federal agency missions, and to establish  
6 Federal policies for managing and archiving climate and  
7 other global change data.

8 SEC. 202. DEFINITIONS.

9 For purposes of this title—

10 (1) the term “metadata” means information de-  
11 scribing the content, quality, condition, and other  
12 characteristics of climate and other global change  
13 data, compiled, to the maximum extent possible, con-  
14 sistent with the requirements of the “Content Stand-  
15 ard for Digital Geospatial Metadata” (FGDC-STD-  
16 001-1998) issued by the Federal Geographic Data  
17 Committee, or any successor standard approved by  
18 the working group; and

19 (2) the term “working group” means the inter-  
20 agency climate and other global change data man-  
21 agement working group established under section  
22 203.



1 SEC. 203. INTERAGENCY CLIMATE AND OTHER GLOBAL  
2 CHANGE DATA MANAGEMENT WORKING  
3 GROUP.

4 (a) ESTABLISHMENT.—The President shall establish  
5 an interagency climate and other global change data man-  
6 agement working group to make recommendations for co-  
7 ordinating Federal climate and other global change data  
8 management and archiving activities.

9 (b) MEMBERSHIP.—The working group shall include  
10 the Administrator of the National Aeronautics and Space  
11 Administration, the Administrator of the National Oceanic  
12 and Atmospheric Administration, the Secretary of Energy,  
13 the Secretary of Defense, the Director of the National  
14 Science Foundation, the Director of the United States Ge-  
15 ological Survey, the Archivist of the United States, the  
16 Administrator of the Environmental Protection Agency,  
17 the Secretary of the Smithsonian Institution, or their des-  
18 ignees, and representatives of any other Federal agencies  
19 the President considers appropriate.

20 (c) REPORTS.—Not later than 1 year after the date  
21 of enactment of this Act, the working group shall transmit  
22 a report to the Congress containing the elements described  
23 in subsection (d). Not later than 3 years after the initial  
24 report under this subsection, and not later than once every  
25 4 years subsequent to that, the working group shall trans-  
26 mit reports updating the previous report. In preparing re-



1 ports under this subsection, the working group shall con-  
2 sult with expected users of the data collected and archived  
3 by the Program.

4 (d) CONTENTS.—The reports and updates required  
5 under subsection (c) shall—

6 (1) include recommendations for the establish-  
7 ment, maintenance, and accessibility of a catalog  
8 identifying all available climate and other global  
9 change data sets;

10 (2) identify climate and other global change  
11 data collections in danger of being lost and rec-  
12 ommend actions to prevent such loss;

13 (3) identify gaps in climate and other global  
14 change data and recommend actions to fill those  
15 gaps;

16 (4) identify effective and compatible procedures  
17 for climate and other global change data collection,  
18 management, and retention and make recommenda-  
19 tions for ensuring their use by Federal agencies and  
20 other appropriate entities;

21 (5) develop and propose a coordinated strategy  
22 for funding and allocating responsibilities among  
23 Federal agencies for climate and other global change  
24 data collection, management, and retention;



1 (6) make recommendations for ensuring that  
2 particular attention is paid to the collection, man-  
3 agement, and archiving of metadata;

4 (7) make recommendations for ensuring a uni-  
5 fied and coordinated Federal capital investment  
6 strategy with respect to climate and other global  
7 change data collection, management, and archiving;

8 (8) evaluate the data record from each observ-  
9 ing system and make recommendations to ensure  
10 that delivered data are free from time-dependent bi-  
11 ases and random errors before they are transferred  
12 to long-term archives; and

13 (9) evaluate optimal design of observation sys-  
14 tem components to ensure a cost-effective, adequate  
15 set of observations detecting and tracking global  
16 change.

**SUB TITLE III—INTERNATIONAL CO-  
18 OPERATION IN GLOBAL  
19 CHANGE RESEARCH**

20 **SEC. 301. FINDINGS AND PURPOSES.**

21 (a) FINDINGS.—The Congress makes the following  
22 findings:

23 (1) Pooling of international resources and sci-  
24 entific capabilities will be essential to a successful  
25 international global change program.



1           (2) While international scientific planning is al-  
2 ready underway, there is currently no comprehensive  
3 intergovernmental mechanism for planning, coordi-  
4 nating, or implementing research to understand  
5 global change and to mitigate possible adverse ef-  
6 fects.

7           (3) An international global change research  
8 program will be important in building future con-  
9 sensus on methods for reducing global environmental  
10 degradation.

11           (4) The United States, as a world leader in en-  
12 vironmental and Earth sciences, should help provide  
13 leadership in developing and implementing an inter-  
14 national global change research program.

15 (b) PURPOSES.—The purposes of this title are to—

16           (1) promote international, intergovernmental  
17 cooperation on global change research;

18           (2) involve scientists and policymakers from de-  
19 veloping nations in such cooperative global change  
20 research programs; and

21           (3) promote international efforts to provide  
22 technical and other assistance to developing nations  
23 which will facilitate improvements in their domestic  
24 standard of living while minimizing damage to the  
25 global or regional environment.



## 1 SEC. 302. INTERNATIONAL DISCUSSIONS.

2 (a) GLOBAL CHANGE RESEARCH.—The President  
3 shall direct the Secretary of State to initiate discussions  
4 with other nations leading toward international protocols  
5 and other agreements to coordinate global change research  
6 activities. Such discussions should include the following  
7 issues:

8 (1) Allocation of costs in global change research  
9 programs, especially with respect to major capital  
10 projects.

11 (2) Coordination of global change research  
12 plans with those developed by international organiza-  
13 tions such as the International Council on Scientific  
14 Unions, the World Meteorological Organization, and  
15 the United Nations Environment Program.

16 (3) Establishment of global change research  
17 centers and training programs for scientists, espe-  
18 cially those from developing nations.

19 (4) Development of innovative methods for  
20 management of international global change research,  
21 including the use of new or existing intergovern-  
22 mental organizations for the coordination or funding  
23 of global change research.

24 (5) Establishment of international offices to  
25 disseminate information useful in identifying, pre-



1 venting, mitigating, or adapting to the possible ef-  
2 fects of global change.

3 (b) ENERGY RESEARCH.—The President shall direct  
4 the Secretary of State (in cooperation with the Secretary  
5 of Energy, the Secretary of Commerce, the United States  
6 Trade Representative, and other appropriate Federal  
7 agents) to initiate discussions with other nations leading  
8 toward an international research protocol for cooperation  
9 on the development of energy technologies which have  
10 minimally adverse effects on the environment. Such dis-  
11 cussions should include the following issues:

12 (1) Creation of an international cooperative  
13 program to fund research related to energy effi-  
14 ciency and conservation, solar and other renewable  
15 energy sources, and passively safe and diversion-re-  
16 sistant nuclear reactors.

17 (2) Creation of an international cooperative  
18 program to develop low-cost energy technologies  
19 which are appropriate to the environmental, eco-  
20 nomic, and social needs of developing nations.

21 (3) Exchange of information concerning envi-  
22 ronmentally safe energy technologies and practices,  
23 including those described in paragraphs (1) and (2).



1 SEC. 303. GLOBAL CHANGE RESEARCH INFORMATION OF-  
2 FICE.

3 The President shall establish an Office of Global  
4 Change Research Information to disseminate to foreign  
5 governments, businesses, and institutions, as well as the  
6 citizens of foreign countries, scientific research and other  
7 information available in the United States which would be  
8 useful in preventing, mitigating, or adapting to the effects  
9 of global change.



**EN BLOC AMENDMENTS TO H.R. 238**  
**OFFERED BY MR. BOEHLERT AND MR. HALL**

Page 2, line 3, through page 17, line 17, redesignate sections 101 through 103 as sections 2 through 4, respectively, and move them to after section 1.

Page 2, line 4, strike "title" and insert "Act".

Page 3, line 6, strike "title" and insert "Act".

Page 4, lines 17 through 20, amend clause (v) to read as follows:

1                   (v) by 2020, meeting the goal de-  
 2                   scribed in section 103(a)(2) of the Spark  
 3                   M. Matsunaga Hydrogen Research, Devel-  
 4                   opment, and Demonstration Act of 1990.

Page 6, line 11, strike "2007" and insert "2012".

Page 6, line 17, strike "\$4,000" and insert "\$5,000".

Page 6, line 20, strike "ELECTRIC".

Page 7, line 12, strike "2006" and insert "2010".

Page 7, line 14, strike "\$150" and insert "\$225".

Page 7, line 15, strike "and".

Page 7, line 20, strike the period and insert “; and”.

Page 7, before line 21, insert the following:

- 1 (iv) reducing the cost of installing the
- 2 ground loop of ground-source heat pumps
- 3 by 30 percent by 2007 compared to the
- 4 cost in 2000.

Page 7, lines 21 through 25, strike subparagraph (E) and redesignate the subsequent subparagraphs accordingly.

Page 8, line 8, strike “subparagraph (G)” and insert “subparagraph (F)”.

Page 12, after line 2, insert the following new paragraph:

- 5 (6) HYDROGEN.—Carry out the Spark M. Mat-
- 6 sunaga Hydrogen Research, Development, and Dem-
- 7 onstration Act of 1990.

Page 13, line 4, strike “(5)” and insert “(6)”.

Page 13, line 20, strike “title” and insert “Act”.

Page 17, strike lines 1 and 2, and redesignate the subsequent subparagraphs accordingly.

Page 18, strike line 1, and redesignate the subsequent paragraphs accordingly.

Page 18, line 9, strike “\$10,000,000 for fiscal year 2003 and”.

Page 18, after line 11, insert the following new paragraph, and redesignate the subsequent paragraphs accordingly:

1           (2) ELECTRIC MOTOR CONTROL TECH-  
2           NOLOGY.—For activities under section 106A,  
3           \$2,000,000 for each of fiscal years 2004 through  
4           2007.

Page 18, strike line 14, and redesignate the subsequent subparagraphs accordingly.

Page 18, strike line 21, and redesignate the subsequent subparagraphs accordingly.

Page 25, line 4, insert “, working with the National Institute of Building Sciences,” after “Initiative”.

Page 25, line 12, insert “be based on whole building principles and shall” after “plan shall”.

Page 26, after line 20, insert the following new section:

5 **SEC. 106A. ELECTRIC MOTOR CONTROL TECHNOLOGY.**

6           The Secretary shall conduct a research, development,  
7           demonstration, and commercial application program on

1 advanced control devices to improve the energy efficiency  
2 of electric motors used in heating, ventilation, air condi-  
3 tioning, and comparable systems.

Page 31, line 12, through page 32, line 1, strike section 109.

Page 33, strike line 10, and redesignate the subsequent paragraphs accordingly.

Page 33, strike lines 17 through 19 and insert: “(a), the following sums shall be available for activities under section 114:

- 4 (1) For fiscal year 2004, \$5,000,000.
- 5 (2) For fiscal year 2005, \$5,500,000.
- 6 (3) For fiscal year 2006, \$6,000,000.
- 7 (4) For fiscal year 2007, \$6,500,000.

Page 34, line 21, strike “and”.

Page 34, line 22, redesignate paragraph (4) as paragraph (5).

Page 34, after line 21, insert the following new paragraph:

- 8 (4) include research, development, demonstra-
- 9 tion, and commercial application of interconnection
- 10 technologies for communications and controls of dis-
- 11 tributed generation architectures, particularly tech-

1 nologies promoting real-time response to power mar-  
2 ket information and physical conditions on the elec-  
3 trical grid; and

Page 38, lines 2 and 3, strike “, including the amounts authorized under the amendments made by sections 124 and 125”.

Page 38, strike line 4, and redesignate the subsequent paragraphs accordingly.

Page 38, line 5, strike “\$460,000,000” and insert “\$380,000,000”.

Page 38, line 6, strike “\$510,000,000” and insert “\$420,000,000”.

Page 38, line 7, strike “\$560,000,000” and insert “\$460,000,000”.

Page 38, line 8, strike “\$609,000,000” and insert “\$499,000,000”.

Page 38, strike line 13, and redesignate the subsequent paragraphs accordingly.

Page 38, line 18, redesignate subsection (c) as subsection (d).

Page 38, after line 17, insert the following new subsection:

1 (c) PUBLIC BUILDINGS.—From the amounts author-  
 2 ized under subsection (a), \$30,000,000 for each of the fis-  
 3 cal years 2004 through 2007 are authorized to be appro-  
 4 priated to carry out section 127.

Page 39, after line 9, insert the following new para-  
 graph:

5 (4) REGIONAL FIELD VERIFICATION.—Of the  
 6 funds authorized under subsection (a), not less than  
 7 \$4,000,000 for each fiscal year shall be made avail-  
 8 able for the Regional Field Verification Program of  
 9 the Department.

Page 39, line 22, through page 56, line 22, strike  
 part 3 and redesignate the subsequent part accordingly.

Page 57, line 3, before “The Secretary” insert “(a)  
 PROGRAMS.—”.

Page 57, after line 11, insert the following:

10 (b) STUDY.—(1) The Secretary shall enter into an  
 11 arrangement with the National Academy of Sciences to  
 12 conduct a study on—

13 (A) the feasibility of various methods of renew-  
 14 able generation of energy from the ocean, including  
 15 energy from waves, tides, currents, and thermal gra-  
 16 dients; and

1 (B) the research, development, demonstration,  
2 and commercial application activities required to  
3 make marine renewable energy generation competi-  
4 tive with other forms of electricity generation.

5 (2) Not later than 1 year after the date of the enact-  
6 ment of this Act, the Secretary shall transmit the study  
7 to the Congress along with the Secretary's recommenda-  
8 tions for implementing the results of the study.

9 **SEC. 127. RENEWABLE ENERGY IN PUBLIC BUILDINGS.**

10 (a) **DEMONSTRATION AND TECHNOLOGY TRANSFER**  
11 **PROGRAM.**—The Secretary shall establish a program for  
12 the demonstration of innovative technologies for solar and  
13 other renewable energy sources in buildings owned or op-  
14 erated by a State or local government, and for the dissemi-  
15 nation of information resulting from such demonstration  
16 to interested parties.

17 (b) **LIMIT ON FEDERAL FUNDING.**—The Secretary  
18 shall provide under this section no more than 40 percent  
19 of the incremental costs of the solar or other renewable  
20 energy source project funded.

21 (c) **REQUIREMENT.**—As part of the application for  
22 awards under this section, the Secretary shall require all  
23 applicants—

- 1 (1) to demonstrate a continuing commitment to  
2 the use of solar and other renewable energy sources  
3 in buildings they own or operate; and  
4 (2) to state how they expect any award to fur-  
5 ther their transition to the significant use of renew-  
6 able energy.

Page 57, lines 15 through 25, strike subsection (a)  
and insert the following:

7 (a) IN GENERAL.—The following sums are author-  
8 ized to be appropriated to the Secretary for nuclear energy  
9 research, development, demonstration, and commercial ap-  
10 plication activities, including activities authorized under  
11 this subtitle:

- 12 (1) For fiscal year 2004, \$388,000,000.  
13 (2) For fiscal year 2005, \$416,000,000.  
14 (3) For fiscal year 2006, \$445,000,000.  
15 (4) For fiscal year 2007, \$474,000,000.

Page 58, strike lines 1 through 8.

Page 58, line 9, redesignate subsection (c) as sub-  
section (b).

Page 58, strike lines 11 through 25, and insert the  
following:

1 (1) NUCLEAR INFRASTRUCTURE SUPPORT.—

2 For activities under section 132(f)—

3 (A) for fiscal year 2004, \$125,000,000;

4 (B) for fiscal year 2005, \$130,000,000;

5 (C) for fiscal year 2006, \$135,000,000;

6 and

7 (D) for fiscal year 2007, \$140,000,000.

8 (2) ADVANCED FUEL RECYCLING PROGRAM.—

9 For activities under section 133—

10 (A) for fiscal year 2004, \$80,000,000;

11 (B) for fiscal year 2005, \$93,000,000;

12 (C) for fiscal year 2006, \$106,000,000;

13 and

14 (D) for fiscal year 2007, \$120,000,000.

15 (3) UNIVERSITY PROGRAMS.—For activities

16 under section 134—

17 (A) for fiscal year 2004, \$35,200,000, of

18 which—

19 (i) \$3,000,000 shall be for activities  
20 under subsection (b)(1) of that section;

21 (ii) \$4,275,000 shall be for activities  
22 under subsection (b)(2) of that section;

23 (iii) \$8,000,000 shall be for activities  
24 under subsection (b)(3) of that section;

10

- 1 (iv) \$500,000 shall be for activities  
2 under subsection (b)(5) of that section;
- 3 (v) \$7,000,000 shall be for activities  
4 under subsection (c)(1) of that section;
- 5 (vi) \$700,000 shall be for activities  
6 under subsection (c)(2) of that section;
- 7 (vii) \$10,000,000 shall be for activi-  
8 ties under subsection (c)(3) of that section;
- 9 (viii) \$1,000,000 shall be for activities  
10 under subsection (d)(1) of that section;  
11 and
- 12 (ix) \$725,000 shall be for activities  
13 under subsection (d)(2) of that section;
- 14 (B) for fiscal year 2005, \$44,350,000, of  
15 which—
- 16 (i) \$3,100,000 shall be for activities  
17 under subsection (b)(1) of that section;
- 18 (ii) \$6,275,000 shall be for activities  
19 under subsection (b)(2) of that section;
- 20 (iii) \$12,000,000 shall be for activities  
21 under subsection (b)(3) of that section;
- 22 (iv) \$550,000 shall be for activities  
23 under subsection (b)(5) of that section;
- 24 (v) \$7,500,000 shall be for activities  
25 under subsection (c)(1) of that section;

11

1 (vi) \$1,100,000 shall be for activities  
2 under subsection (c)(2) of that section;

3 (vii) \$12,000,000 shall be for activi-  
4 ties under subsection (c)(3) of that section;

5 (viii) \$1,100,000 shall be for activities  
6 under subsection (d)(1) of that section;

7 and

8 (ix) \$725,000 shall be for activities  
9 under subsection (d)(2) of that section;

10 (C) for fiscal year 2006, \$49,200,000, of  
11 which—

12 (i) \$3,200,000 shall be for activities  
13 under subsection (b)(1) of that section;

14 (ii) \$7,150,000 shall be for activities  
15 under subsection (b)(2) of that section;

16 (iii) \$13,000,000 shall be for activities  
17 under subsection (b)(3) of that section;

18 (iv) \$600,000 shall be for activities  
19 under subsection (b)(5) of that section;

20 (v) \$8,000,000 shall be for activities  
21 under subsection (c)(1) of that section;

22 (vi) \$1,200,000 shall be for activities  
23 under subsection (c)(2) of that section;

24 (vii) \$14,000,000 shall be for activi-  
25 ties under subsection (c)(3) of that section;

12

1 (viii) \$1,200,000 shall be for activities  
2 under subsection (d)(1) of that section;  
3 and  
4 (ix) \$850,000 shall be for activities  
5 under subsection (d)(2) of that section;  
6 and  
7 (D) for fiscal year 2007, \$54,950,000, of  
8 which—  
9 (i) \$3,200,000 shall be for activities  
10 under subsection (b)(1) of that section;  
11 (ii) \$8,150,000 shall be for activities  
12 under subsection (b)(2) of that section;  
13 (iii) \$15,000,000 shall be for activities  
14 under subsection (b)(3) of that section;  
15 (iv) \$650,000 shall be for activities  
16 under subsection (b)(5) of that section;  
17 (v) \$8,500,000 shall be for activities  
18 under subsection (c)(1); of that section;  
19 (vi) \$1,300,000 shall be for activities  
20 under subsection (c)(2) of that section;  
21 (vii) \$16,000,000 shall be for activi-  
22 ties under subsection (c)(3) of that section;  
23 (viii) \$1,300,000 shall be for activities  
24 under subsection (d)(1) of that section;  
25 and

1 (ix) \$850,000 shall be for activities  
 2 under subsection (d)(2) of that section.

Page 58, after line 25, insert the following new paragraph:

3 (4) GEOLOGICAL ISOLATION OF SPENT FUEL.—  
 4 For activities under section 135—  
 5 (A) for fiscal year 2004, \$7,000,000;  
 6 (B) for fiscal year 2005, \$8,000,000;  
 7 (C) for fiscal year 2006, \$9,000,000; and  
 8 (D) for fiscal year 2007, \$10,000,000.

Page 59, line 1, redesignate subsection (d) as subsection (e).

Page 61, strike lines 5 through 8, and insert the following:

9 (e) NUCLEAR PRODUCTION OF HYDROGEN.—Pursu-  
 10 ant to the Spark M. Matsunaga Hydrogen Research, De-  
 11 velopment, and Demonstration Act of 1990, as amended  
 12 by subtitle H of this Act, the Secretary shall carry out  
 13 a program of research, development, demonstration, and  
 14 commercial application on various approaches to nuclear  
 15 production of hydrogen.

Page 63, line 21, strike “MAINTAINING” and insert “STRENGTHENING”.

Page 64, line 7, insert “, through the Innovations in Nuclear Infrastructure and Education Program,” after “providing funding”.

Page 65, after line 2, insert the following:

1 **PART 5—GEOLOGICAL ISOLATION OF SPENT**

2 **FUEL**

3 **SEC. 135. GEOLOGICAL ISOLATION OF SPENT FUEL.**

4 (a) **IN GENERAL.**—The Secretary shall establish a  
5 program to determine the feasibility of deep borehole dis-  
6 posal of spent nuclear fuel and high-level radioactive  
7 waste. The program shall emphasize geological, chemical,  
8 and hydrological characterization of, and design of engi-  
9 neered structures for, deep borehole environments.

10 (b) **PLAN.**—Not later than 6 months after the date  
11 of enactment of this Act, the Secretary shall transmit to  
12 the Congress a plan for the program under this section,  
13 including milestones for achieving the purpose of the pro-  
14 gram.

15 (c) **FINAL REPORT.**—Not later than 5 years after the  
16 date of enactment of this Act, the Secretary shall transmit  
17 to the Congress a final report on the findings of the pro-  
18 gram under this section.

Page 65, lines 9 and 10, strike “including activities authorized under this subtitle, other than those described

in subsection (b)” and insert “other than those described in subsection (b), including activities authorized under this subtitle but not including activities authorized under title V”.

Page 65, strike line 11, and redesignate the subsequent paragraphs accordingly.

Page 65, line 12, strike “\$523,000,000” and insert “\$530,000,000”.

Page 65, line 13, strike “\$542,000,000” and insert “\$556,000,000”.

Page 65, line 14, strike “\$558,000,000” and insert “\$583,000,000”.

Page 65, line 15, strike “\$585,000,000” and insert “\$611,000,000”.

Page 65, after line 15, insert the following:

- 1 No less than 60 percent of the amount appropriated for
- 2 each fiscal year under this subsection shall be available
- 3 for activities related to the coal research program under
- 4 section 142(a).

Page 65, line 19, strike “2003” and insert “2004”.

Page 68, line 4, strike “2003” and insert “2004”.

Page 68, line 13, strike “2003” and insert “2004”.

Page 69, lines 20 through 23, strike “No funds” and all that follows through “has transmitted” and insert “Not later than 6 months after the date of enactment of this Act, the Secretary shall transmit”.

Page 70, line 18, strike “The Secretary” and insert “In coordination with the programs described in the Spark M. Matsunaga Hydrogen Research, Development, and Demonstration Act of 1990, as amended by subtitle H of this Act, the Secretary”.

Page 71, after line 11, insert the following new subsection:

1       (e) TECHNOLOGY TRANSFER.—To the maximum ex-  
2 tent practicable, existing technology transfer mechanisms  
3 shall be used to implement oil and gas exploration and  
4 production technology transfer programs.

Page 73, lines 22 and 23, strike “section 144(b)(1) through (3)” and insert “subsection (b)”.

Page 89, after line 8, add the following new section:

5 **SEC. 150A. TRANSFER OF ADVANCED OIL AND GAS EXPLO-**  
6 **RATION AND PRODUCTION TECHNOLOGIES.**

7       (a) ASSESSMENT.—The Secretary shall review tech-  
8 nology programs throughout the Federal Government to  
9 assess the suitability of technologies developed thereunder

1 for use in ultradeep drilling research, development, dem-  
2 onstration, and commercial application.

3 (b) TECHNOLOGY TRANSFER.—Not later than 1 year  
4 after the date of enactment of this Act, the Secretary shall  
5 issue a solicitation seeking organizations knowledgeable of  
6 the technology needs of the ultradeep drilling industry.  
7 The Secretary shall select the most qualified applicant to  
8 manage a program to transfer technologies the Secretary  
9 determines suitable under subsection (a) to appropriate  
10 entities. The organization selected under section 145(d)  
11 shall not be eligible for selection under this subsection.

12 (c) FUNDING.—From the funds available under sec-  
13 tion 141(b)(3)(C), \$1,000,000 shall be available to carry  
14 out this section in each of the fiscal years 2004 through  
15 2007.

Page 89, line 13, strike “section” and insert “part”.

Page 91, line 4, strike “170(e)(2)(C)(ii)” and insert  
“170(e)(2)(C)”.

Page 91, strike line 10, and redesignate the subse-  
quent paragraphs accordingly.

Page 91, line 13, strike “\$4,586,000,000” and in-  
sert “\$4,618,000,000”.

Page 91, line 14, strike “\$5,000,000,000” and in-  
sert “\$5,310,000,000”.

Page 91, lines 17 through 25, amend paragraph (1)  
to read as follows:

- 1           (1) FUSION ENERGY SCIENCES.—(A) For the  
2           Fusion Energy Sciences Program, excluding activi-  
3           ties under sections 161A and 162—  
4                 (i) for fiscal year 2004, \$276,000,000;  
5                 (ii) for fiscal year 2005, \$300,000,000;  
6                 (iii) for fiscal year 2006, \$340,000,000;  
7           and  
8                 (iv) for fiscal year 2007, \$350,000,000.  
9           (B) For activities under section 161A and for  
10           the project described in section 162—  
11                 (i) for fiscal year 2004, \$12,000,000;  
12                 (ii) for fiscal year 2005, \$20,000,000;  
13                 (iii) for fiscal year 2006, \$50,000,000; and  
14                 (iv) for fiscal year 2007, \$75,000,000.

Page 92, strike line 4, and redesignate the subse-  
quent clauses accordingly.

Page 92, line 20, through page 93, line 21, amend  
paragraph (3) to read as follows:

- 15           (3) NANOTECHNOLOGY RESEARCH AND DEVEL-  
16           OPMENT.—For activities under section 169—  
17                 (A) for fiscal year 2004, \$265,000,000;  
18                 (B) for fiscal year 2005, \$292,000,000;

19

1 (C) for fiscal year 2006, \$322,000,000;  
 2 and  
 3 (D) for fiscal year 2007, \$355,000,000.

Page 93, lines 24 and 25, strike “plans described in sections 162 and 163” and insert “plan described in section 162”.

Page 94, before line 2, insert the following new section:

4 **SEC. 161A. ITER.**

5 (a) IN GENERAL.—The United States is authorized  
 6 to participate in ITER in accordance with the provisions  
 7 of this section.

8 (b) AGREEMENT.—(1) The Secretary is authorized to  
 9 negotiate an agreement for United States participation in  
 10 ITER.

11 (2) Any agreement for United States participation in  
 12 ITER shall, at a minimum—

13 (A) clearly define the United States financial  
 14 contribution to construction and operating costs;

15 (B) ensure that the share of ITER’s high-tech-  
 16 nology components manufactured in the United  
 17 States is at least proportionate to the United States  
 18 financial contribution to ITER;

1 (C) ensure that the United States will not be fi-  
2 nancially responsible for cost overruns in compo-  
3 nents manufactured in other ITER participating  
4 countries;

5 (D) guarantee the United States full access to  
6 all data generated by ITER;

7 (E) enable United States researchers to propose  
8 and carry out an equitable share of the experiments  
9 at ITER;

10 (F) provide the United States with a role in all  
11 collective decisionmaking related to ITER; and

12 (G) describe the process for discontinuing or  
13 decommissioning ITER and any United States role  
14 in those processes.

15 (c) PLAN.—The Secretary, in consultation with the  
16 Fusion Energy Sciences Advisory Committee, shall de-  
17 velop a plan for the participation of United States sci-  
18 entists in ITER that shall include the United States re-  
19 search agenda for ITER, methods to evaluate whether  
20 ITER is promoting progress toward making fusion a reli-  
21 able and affordable source of power, and a description of  
22 how work at ITER will relate to other elements of the  
23 United States fusion program. The Secretary shall request  
24 a review of the plan by the National Academy of Sciences.

1 (d) LIMITATION.—No funds shall be expended for the  
2 construction of ITER until the Secretary has transmitted  
3 to the Congress—

4 (1) the agreement negotiated pursuant to sub-  
5 section (b) and 120 days have elapsed since that  
6 transmission;

7 (2) a report describing the management struc-  
8 ture of ITER and providing a fixed dollar estimate  
9 of the cost of United States participation in the con-  
10 struction of ITER, and 120 days have elapsed since  
11 that transmission;

12 (3) a report describing how United States par-  
13 ticipation in ITER will be funded without reducing  
14 funding for other programs in the Office of Science,  
15 including other fusion programs, and 60 days have  
16 elapsed since that transmission; and

17 (4) the plan required by subsection (c) (but not  
18 the National Academy of Sciences review of that  
19 plan), and 60 days have elapsed since that trans-  
20 mission.

21 (e) DEFINITIONS.—In this section—

22 (1) the term “construction” means the physical  
23 construction of the ITER facility, and the physical  
24 construction, purchase, or manufacture of equipment  
25 or components that are specifically designed for the

1 ITER facility, but does not mean the design of the  
2 facility, equipment, or components; and

3 (2) the term "ITER" means the international  
4 burning plasma fusion research project in which the  
5 President announced United States participation on  
6 January 30, 2003.

Page 94, line 2, through page 96, line 20, amend  
sections 162 and 163 to read as follows:

7 **SEC. 162. PLAN FOR FUSION EXPERIMENT.**

8 (a) IN GENERAL.—If at any time during the negotia-  
9 tions on ITER, the Secretary determines that construction  
10 and operation of ITER is unlikely or infeasible, the Sec-  
11 retary shall send to Congress, as part of the budget re-  
12 quest for the following year, a plan for implementing the  
13 domestic burning plasma experiment known as FIRE, in-  
14 cluding costs and schedules for such a plan. The Secretary  
15 shall refine such plan in full consultation with the Fusion  
16 Energy Sciences Advisory Committee and shall also trans-  
17 mit such plan to the National Academy of Sciences for  
18 review.

19 (b) DEFINITIONS.—As used in this section—

20 (1) the term "ITER" has the meaning given  
21 that term in section 161A; and

22 (2) the term "FIRE" means the Fusion Igni-  
23 tion Research Experiment, the fusion research ex-

1 periment for which design work has been supported  
2 by the Department as a possible alternative burning  
3 plasma experiment in the event that ITER fails to  
4 move forward.

5 **SEC. 163. PLAN FOR FUSION ENERGY SCIENCES PROGRAM.**

6 (a) DECLARATION OF POLICY.—It shall be the policy  
7 of the United States to conduct research, development,  
8 demonstration, and commercial application to provide for  
9 the scientific, engineering, and commercial infrastructure  
10 necessary to ensure that the United States is competitive  
11 with other nations in providing fusion energy for its own  
12 needs and the needs of other nations, including by dem-  
13 onstrating electric power or hydrogen production for the  
14 United States energy grid utilizing fusion energy at the  
15 earliest date possible.

16 (b) FUSION ENERGY PLAN.—

17 (1) IN GENERAL.—Within 6 months after the  
18 date of enactment of this Act, the Secretary shall  
19 transmit to Congress a plan for carrying out the pol-  
20 icy set forth in subsection (a), including cost esti-  
21 mates, proposed budgets, potential international  
22 partners, and specific programs for implementing  
23 such policy.

24 (2) REQUIREMENTS OF PLAN.—Such plan shall  
25 also ensure that—

1 (A) existing fusion research facilities are  
2 more fully utilized;

3 (B) fusion science, technology, theory, ad-  
4 vanced computation, modeling, and simulation  
5 are strengthened;

6 (C) new magnetic and inertial fusion re-  
7 search facilities are selected based on scientific  
8 innovation, cost effectiveness, and their poten-  
9 tial to advance the goal of practical fusion en-  
10 ergy at the earliest date possible;

11 (D) such facilities that are selected are  
12 funded at a cost-effective rate;

13 (E) communication of scientific results and  
14 methods between the fusion energy science com-  
15 munity and the broader scientific and tech-  
16 nology communities is improved;

17 (F) inertial confinement fusion facilities  
18 are utilized to the extent practicable for the  
19 purpose of inertial fusion energy research and  
20 development; and

21 (G) attractive alternative inertial and mag-  
22 netic fusion energy approaches are more fully  
23 explored.

24 (3) REPORT ON FUSION MATERIALS AND TECH-  
25 NOLOGY PROJECT.—In addition, the plan required

1 by this subsection shall also address the status of,  
 2 and to the degree possible, the costs and schedules  
 3 for—

4 (A) the design and implementation of  
 5 international or national facilities for the test-  
 6 ing of fusion materials; and

7 (B) the design and implementation of  
 8 international or national facilities for the test-  
 9 ing and development of key fusion technologies.

Page 98, line 25, through page 99, line 1, strike  
 “2003, 2004, and 2005” and insert “2004, 2005, and  
 2006”.

Page 99, line 4, through page 100, line 22, amend  
 section 169 to read as follows:

10 **SEC. 169. NANOTECHNOLOGY RESEARCH AND DEVELOP-**  
 11 **MENT.**

12 (a) **IN GENERAL.**—The Secretary, acting through the  
 13 Office of Science, shall implement a Nanotechnology Re-  
 14 search and Development Program to promote  
 15 nanotechnology research, development, demonstration,  
 16 education, technology transfer, and commercial applica-  
 17 tion activities as necessary to ensure continued United  
 18 States leadership in nanotechnology across scientific and  
 19 engineering disciplines.

1 (b) PROGRAM ACTIVITIES.—The activities of the  
2 Nanotechnology Research and Development Program shall  
3 be designed to—

4 (1) provide sustained support for  
5 nanotechnology research and development through—

6 (A) grants to individual investigators and  
7 interdisciplinary teams of investigators; and

8 (B) establishment of interdisciplinary re-  
9 search centers and advanced technology user fa-  
10 cilities;

11 (2) ensure that solicitation and evaluation of  
12 proposals under the Program encourage interdiscipli-  
13 nary research;

14 (3) expand education and training of under-  
15 graduate and graduate students in interdisciplinary  
16 nanotechnology science and engineering;

17 (4) accelerate the commercial application of  
18 nanotechnology innovations in the private sector;

19 (5) ensure that societal and ethical concerns  
20 will be addressed as the technology is developed by  
21 integrating, insofar as possible, research on such  
22 concerns with nanotechnology research and develop-  
23 ment; and

24 (6) ensure that the potential of nanotechnology  
25 to produce or facilitate the production of clean, inex-

1 pensive energy is realized by supporting  
2 nanotechnology energy applications research and de-  
3 velopment.

4 (c) DEFINITIONS.—For the purposes of this  
5 section—

6 (1) the term “nanotechnology” means science  
7 and engineering aimed at creating materials, devices,  
8 and systems at the atomic and molecular level; and

9 (2) the term “advanced technology user facil-  
10 ity” means a nanotechnology research and develop-  
11 ment facility supported, in whole or in part, by Fed-  
12 eral funds that is open to all United States research-  
13 ers on a competitive, merit-reviewed basis.

Page 102, line 1, strike “maintain” and insert “de-  
velop and maintain”.

Page 103, lines 16 through 25, amend subparagraph  
(C) to read as follows:

14 (C) by amending subsection (e) to read as  
15 follows:

16 “(e) AUTHORIZATION OF APPROPRIATIONS.—There  
17 are authorized to be appropriated to the Secretary of En-  
18 ergy to carry out the Networking and Information Tech-  
19 nology Research and Development Program such sums as  
20 may be necessary for fiscal years 2004 through 2007.”.

Page 104, after line 24, insert the following new section:

1 **SEC. 170A. NITROGEN FIXATION.**

2       The Secretary, acting through the Office of Science,  
3 shall support a program of research, development, dem-  
4 onstration, and commercial application on biological nitro-  
5 gen fixation, including plant genomics research relevant  
6 to the development of commercial crop varieties with en-  
7 hanced nitrogen fixation efficiency and ability.

Page 105, strike line 8, and redesignate the subsequent paragraphs accordingly.

Page 105, line 16, strike “2003” and insert “2004”.

Page 108, lines 1 through 7, strike section 177 and redesignate the subsequent section accordingly.

Page 108, after line 15, add the following new section and the following new subtitle, and redesignate the subsequent subtitle accordingly:

8 **SEC. 178. FUEL CELL TEST CENTER.**

9       (a) **STUDY.**—Not later than 1 year after the date of  
10 enactment of this Act, the Secretary shall transmit to the  
11 Congress a report on the results of a study of the estab-  
12 lishment of a test center for next-generation fuel cells at  
13 an institution of higher education that has available a con-

1 tinuous source of hydrogen and access to the electric  
 2 transmission grid. Such report shall include a conceptual  
 3 design for such test center and a projection of the costs  
 4 of establishing the test center.

5 (b) AUTHORIZATION OF APPROPRIATIONS.—There  
 6 are authorized to be appropriated to the Secretary for car-  
 7 rying out this section \$500,000.

## 8 **Subtitle H—Hydrogen**

### 9 **SEC. 181. SHORT TITLE.**

10 This subtitle may be cited as the “George E. Brown,  
 11 Jr. and Robert S. Walker Hydrogen Future Act of 2003”.

### 12 **SEC. 182. MATSUNAGA ACT AMENDMENT.**

13 The Spark M. Matsunaga Hydrogen Research, Devel-  
 14 opment, and Demonstration Act of 1990 (42 U.S.C.  
 15 12401 et seq.) is amended by striking sections 102  
 16 through 109 and inserting the following:

### 17 **“SEC. 102. FINDINGS AND DEFINITIONS.**

18 “(a) FINDINGS.—Congress finds that—

19 “(1) the United States is currently dependent  
 20 on foreign sources for a majority of its petroleum  
 21 supply;

22 “(2) the Nation’s dependence on foreign petro-  
 23 leum is expected to increase in the decades ahead;

24 “(3) it is in the national interest to reduce de-  
 25 pendence on imported petroleum by accelerating

1 Federal efforts to partner with the private sector in  
2 developing hydrogen and fuel cell technologies;

3 “(4) it is in the national interest to support in-  
4 dustry’s efforts to develop a light duty vehicle fleet  
5 that is free or near free of pollutant emissions and  
6 greenhouse gas emissions, and that helps to reduce  
7 the Nation’s dependence on petroleum in a manner  
8 that maintains the freedom of consumers to pur-  
9 chase the kinds of vehicles they wish to drive and  
10 the freedom to refuel those vehicles safely and  
11 affordably;

12 “(5) the development of hydrogen fuel cell vehi-  
13 cles and supporting infrastructure will benefit from  
14 and accelerate the parallel advancement of fuel cells  
15 for stationary power that will enhance the resiliency,  
16 reliability, and environmental performance of the  
17 Nation’s electricity infrastructure;

18 “(6) fuel cell technology for consumer elec-  
19 tronics and portable power will benefit from, and ad-  
20 vance the development of, hydrogen fuel cell vehicles  
21 and supporting infrastructure;

22 “(7) there is a need for deployment of bridging  
23 technologies that can contribute to reducing petro-  
24 leum demand and decreasing air emissions,  
25 including—

1           “(A) gasoline-electric and diesel-electric hy-  
2           brid drive systems;

3           “(B) advanced combustion engines (includ-  
4           ing clean diesel), electric battery, and power  
5           electronics; and

6           “(C) alternative fuels and other tech-  
7           nologies;

8           “(8) low-cost hydrogen production, storage, and  
9           delivery facilities are essential to the success of the  
10          FreedomCAR program; and

11          “(9) vehicle technology development work  
12          should be performed in a manner that is cognizant  
13          of consumer acceptance and marketplace success.

14          “(b) DEFINITIONS.—In this Act:

15               “(1) The term ‘Advisory Committee’ means the  
16               Hydrogen Technical and Fuel Cell Advisory Com-  
17               mittee established under section 108 of this Act.

18               “(2) The term ‘Department’ means the Depart-  
19               ment of Energy.

20               “(3) The term ‘fuel cell’ means a device that di-  
21               rectly converts the chemical energy of a fuel and an  
22               oxidant into electricity by an electrochemical process  
23               taking place at separate electrodes in the device.

24               “(4) The term ‘FreedomCAR’ is the acronym  
25               for a Department initiative in automotive research

1 and development entitled 'Freedom Cooperative  
2 Automotive Research'.

3 "(5) The term 'infrastructure' means the equip-  
4 ment, systems, or facilities used to produce, dis-  
5 tribute, deliver, or store hydrogen and other ad-  
6 vanced clean fuels.

7 "(6) The term 'light duty vehicle' means a car  
8 or truck classified by the Department of Transpor-  
9 tation as a Class I or IIA vehicle.

10 "(7) The term 'Secretary' means the Secretary  
11 of Energy.

12 **"SEC. 103. PROGRAM.**

13 "(a) IN GENERAL.—The Secretary shall conduct a  
14 research, development, demonstration, and commercial ap-  
15 plication program designed to accelerate the use of hydro-  
16 gen and related technologies in stationary and transpor-  
17 tation applications. The goals of the program shall  
18 include—

19 "(1) to enable a decision by automakers not  
20 later than 2015 to offer affordable and technically  
21 viable hydrogen fuel cell vehicles in the mass con-  
22 sumer market; and

23 "(2) to enable production and delivery to con-  
24 sumers of model year 2020 hydrogen fuel cell vehi-  
25 cles that will have—

1           “(A) a range of at least three hundred  
2 miles;

3           “(B) safety and performance comparable  
4 to vehicle technologies in the market; and

5           “(C) when compared to light duty vehicles  
6 in model year 2003—

7           “(i) a fuel economy that is two and  
8 one half times the equivalent fuel economy  
9 of comparable light duty vehicles in model  
10 year 2003; and

11           “(ii) zero or near zero emissions of  
12 pollutants; and

13           “(D) vehicle fuel system crash integrity  
14 and occupant protection.

15           “(b) ACTIVITIES.—The program authorized under  
16 this section shall address—

17           “(1) production of hydrogen from diverse en-  
18 ergy sources, including—

19           “(A) fossil fuels, in conjunction with car-  
20 bon capture and sequestration;

21           “(B) hydrogen-carrier fuels (including eth-  
22 anol and methanol);

23           “(C) renewable energy resources; and

24           “(D) nuclear energy;

1           “(2) delivery of hydrogen or hydrogen-carrier  
2 fuels, including—

3                   “(A) transmission by pipeline and other  
4 distribution methods; and

5                   “(B) safe, convenient, and economic refuel-  
6 ing of vehicles either at central refueling sta-  
7 tions or through distributed on-site generation;

8           “(3) storage of hydrogen or hydrogen-carrier  
9 fuels, including development of materials for safe  
10 and economic storage in gaseous, liquid, or solid  
11 form at refueling facilities and onboard vehicles;

12                   “(4) development of safe, durable, affordable,  
13 and efficient fuel cells, including research and devel-  
14 opment on fuel-flexible fuel cell power systems, im-  
15 proved manufacturing processes, high-temperature  
16 membranes, cost-effective fuel processing for natural  
17 gas, fuel cell stack and system reliability, low tem-  
18 perature operation, and cold start capability; and

19                   “(5) development, in conjunction with the Na-  
20 tional Institute of Standards and Technology, of  
21 necessary codes and standards (including inter-  
22 national codes and standards) and safety practices  
23 for the production, distribution, storage, and use of  
24 hydrogen, hydrogen-carrier fuels and related prod-  
25 ucts.

1       “(e) DEMONSTRATION.—In carrying out the dem-  
2 onstration program under this section, the Secretary shall  
3 fund a limited number of projects and shall, to the extent  
4 practicable—

5           “(1) select only projects that—

6               “(A) involve using hydrogen and related  
7 products at facilities or installations that would  
8 exist without the demonstration program, such  
9 as existing office buildings, military bases, vehi-  
10 cle fleet centers, transit bus authorities, or  
11 parks; and

12               “(B) depend on reliable power from hydro-  
13 gen to carry out essential activities; and

14           “(2) favor projects that—

15               “(A) lead to the replication of hydrogen  
16 technologies and draw such technologies into  
17 the marketplace;

18               “(B) integrate in a single project both mo-  
19 bile and stationary applications of hydrogen fuel  
20 cells;

21               “(C) address the interdependency of de-  
22 mand for hydrogen fuel cell applications and  
23 hydrogen fuel infrastructure; or

24               “(D) raise awareness of hydrogen tech-  
25 nology among the public.

1       “(d) MERIT REVIEW.—The Secretary shall carry out  
2 the program under this section using a competitive, merit-  
3 review process and consistent with the generally applicable  
4 Federal laws and regulations governing awards of finan-  
5 cial assistance, contracts, or other agreements.

6       “(e) COST SHARING.—(1) For projects carried out  
7 through grants, cooperative agreements, or contracts  
8 under this section, the Secretary shall require a commit-  
9 ment from non-Federal sources of at least—

10           “(A) 20 percent of the cost of a research and  
11 development project; and

12           “(B) 50 percent of the cost of a demonstration  
13 project.

14       “(2) The Secretary may reduce the cost-sharing re-  
15 quirement under paragraph (1)—

16           “(A) if the Secretary determines that the  
17 project involves research of a basic or fundamental  
18 nature;

19           “(B) if the Secretary determines that a dem-  
20 onstration or commercial application project involves  
21 unusual technological risks; or

22           “(C) for technical analyses or other activities  
23 that the Secretary does not expect to result in a  
24 marketable product.

1       “(3) The Secretary may consider the size of the non-  
2 Federal share in selecting projects.

3 **“SEC. 104. FREEDOM CAR**

4       “(a) IN GENERAL.—In coordination with the pro-  
5 gram under section 103, the Secretary shall carry out a  
6 research, development, demonstration, and commercial ap-  
7 plication program on advanced vehicle technologies, to be  
8 known as the FreedomCAR program.

9       “(b) ACTIVITIES.—The FreedomCAR program shall  
10 address—

11           “(1) engine and emission control systems;

12           “(2) energy storage, electric propulsion, and hy-  
13 brid systems;

14           “(3) automotive materials;

15           “(4) clean fuels in addition to hydrogen; and

16           “(5) other advanced vehicle technologies.

17       “(c) DEMONSTRATION.—Demonstrations involving  
18 hydrogen shall be conducted as part of the program under  
19 section 103.

20       “(d) MERIT REVIEW AND COST SHARING.—The Sec-  
21 retary shall carry out the FreedomCAR program in com-  
22 pliance with sections 103(d) and (e).

23 **“SEC. 105. PLAN.**

24       “Not later than six months after the date of enact-  
25 ment of the George E. Brown, Jr. and Robert S. Walker

1 Hydrogen Future Act of 2003, the Secretary shall trans-  
2 mit to the Congress a coordinated plan for the programs  
3 described in sections 103 and 104 and any other programs  
4 of the Department that are directly related to fuel cells  
5 or hydrogen. The plan shall be consistent with the Na-  
6 tional Hydrogen Energy Roadmap published by the De-  
7 partment in October of 2002 and shall describe, at a  
8 minimum—

9 “(1) the agenda for the programs for the next  
10 five years, including what research, development,  
11 demonstration, and commercial application will be  
12 conducted to carry out each activity enumerated in  
13 sections 103(b) and 104(b);

14 “(2) the role national laboratories, institutions  
15 of higher education, small businesses, and other pri-  
16 vate sector firms are expected to play in the pro-  
17 grams;

18 “(3) the technical milestones that will be used  
19 to evaluate the programs for the next five years;

20 “(4) the most significant technical hurdles that  
21 stand in the way of achieving the goals described in  
22 section 103(a), and how the programs will address  
23 those hurdles; and

24 “(5) the policy assumptions that are driving the  
25 research agenda, including any assumptions that

1 would affect the sources of hydrogen or the market-  
2 ability of hydrogen-related products.

3 **“SEC. 106. EDUCATION, OUTREACH, AND TECHNOLOGY**  
4 **TRANSFER.**

5 “(a) IN GENERAL.—The Secretary may carry out  
6 programs and activities for interagency, intergovern-  
7 mental, and international education, information ex-  
8 change, and cooperation related to hydrogen and hydro-  
9 gen-related products.

10 “(b) TECHNOLOGY TRANSFER.—(1) The Secretary  
11 may conduct a program to transfer technology to the pri-  
12 vate sector under this Act. The purpose of the technology  
13 transfer program is to foster the exchange of generic, non-  
14 proprietary information and technology, developed under  
15 this Act, among industry, academia, and the Federal Gov-  
16 ernment, to help the United States economy attain the  
17 economic benefits of this information and technology,  
18 among other purposes.

19 “(2) The Secretary shall direct the program author-  
20 ized by this subsection with the advice and assistance of  
21 the Advisory Committee.

22 **“SEC. 107. INTERAGENCY TASK FORCE.**

23 “(a) ESTABLISHMENT.—Not later than 120 days  
24 after the date of enactment of the George E. Brown, Jr.  
25 and Robert S. Walker Hydrogen Future Act of 2003, the

1 President shall establish an interagency task force, chaired  
2 by the Director of the Office of Science and Technology  
3 Policy or his designee, with representatives from each of  
4 the following:

5           “(1) The Department of Energy.

6           “(2) The Department of Transportation.

7           “(3) The Department of State.

8           “(4) The Department of Defense.

9           “(5) The Department of Commerce (including  
10 the National Institute of Standards and Tech-  
11 nology).

12           “(6) The Environmental Protection Agency.

13           “(7) The National Aeronautics and Space Ad-  
14 ministration.

15           “(8) Other Federal agencies as the Director de-  
16 termines appropriate.

17           “(b) DUTIES.—

18           “(1) IMPLEMENTATION.—The interagency task  
19 force shall work toward development of—

20           “(A) a safe, economical, and environ-  
21 mentally sound hydrogen infrastructure;

22           “(B) uniform hydrogen codes, standards,  
23 and safety protocols;

1           “(C) fuel cells in government applications,  
2           including portable, stationary, and transpor-  
3           tation applications; and

4           “(D) vehicle hydrogen fuel system integrity  
5           safety performance.

6           “(2) ACTIVITIES.—The interagency task force  
7           may organize workshops and conferences, may issue  
8           publications, and may create databases to carry out  
9           its duties. The interagency task force shall—

10           “(A) foster the exchange of generic, non-  
11           proprietary information and technology among  
12           industry, academia, and government;

13           “(B) develop and maintain an inventory  
14           and assessment of hydrogen, fuel cells, and  
15           other advanced technologies, including the com-  
16           mercial capability of each technology for the  
17           economic and environmentally safe production,  
18           distribution, delivery, storage, and use of hydro-  
19           gen;

20           “(C) integrate technical and other informa-  
21           tion made available as a result of the programs  
22           and activities under this Act;

23           “(D) promote the marketplace introduction  
24           of infrastructure for hydrogen-powered fuel cell  
25           vehicles; and

1           “(E) conduct an education program to pro-  
2           vide hydrogen and fuel cell information to po-  
3           tential end-users in coordination with the pro-  
4           gram under section 106.

5           “(e) AGENCY COOPERATION.—The heads of all agen-  
6           cies, including those whose agencies are not represented  
7           on the interagency task force, shall cooperate with and  
8           furnish information to the interagency task force and the  
9           Department.

10       **“SEC. 108. ADVISORY COMMITTEE.**

11           “(a) ESTABLISHMENT.—The Hydrogen Technical  
12           and Fuel Cell Advisory Committee shall be established to  
13           advise the Secretary on the programs and activities under  
14           this Act.

15           “(b) MEMBERSHIP.—

16           “(1) MEMBERS.—The Secretary shall appoint  
17           not fewer than 12 nor more than 25 members. The  
18           Secretary shall appoint members to represent domes-  
19           tic industry, academia, professional societies, govern-  
20           ment agencies, and financial, environmental, and  
21           other appropriate organizations based on the Sec-  
22           retary’s assessment of the technical and other quali-  
23           fications of committee members and the needs of the  
24           Advisory Committee.

1           “(2) TERMS.—The term of a member of the  
2     Advisory Committee shall be not more than three  
3     years. The Secretary may appoint members of the  
4     Advisory Committee in a manner that allows the  
5     terms of the members serving at any time to expire  
6     at spaced intervals so as to ensure continuity in the  
7     functioning of the Advisory Committee. A member of  
8     the Advisory Committee whose term is expiring may  
9     be reappointed.

10          “(3) CHAIRPERSON.—The Chair of the Advi-  
11     sory Committee shall be a member of the Advisory  
12     Committee, elected by the members from among  
13     their number.

14          “(c) REVIEW.—(1) The Advisory Committee shall re-  
15     view and make recommendations to the Secretary in a bi-  
16     ennial report on—

17           “(A) the implementation of programs and ac-  
18     tivities under this Act; and

19           “(B) the safety, economical, environmental, and  
20     other consequences of technologies for the produc-  
21     tion, distribution, delivery, storage, or use of hydro-  
22     gen and fuel cells.

23          “(2) The Secretary shall transmit the report under  
24     this subsection to the Congress along with a description  
25     of how the Secretary has implemented or plans to imple-

1 ment the recommendations, or an explanation of the rea-  
2 sons that a recommendation will not be implemented. The  
3 report shall be transmitted along with the President's  
4 budget proposal.

5 “(d) **ADVISORY COMMITTEE SUPPORT.**—The Sec-  
6 retary shall provide resources necessary in the judgment  
7 of the Secretary for the Advisory Committee to carry out  
8 its responsibilities under this Act.

9 **“SEC. 109. EXTERNAL REVIEW.**

10 “(a) **PLAN.**—The Secretary shall enter into an ar-  
11 rangement with a competitively selected nongovernmental  
12 entity, such as the National Academy of Sciences, to re-  
13 view the plan prepared under section 105. The Secretary  
14 shall transmit the review to the Congress along with a plan  
15 to implement the review's recommendations or an expla-  
16 nation of the reasons that a recommendation will not be  
17 implemented.

18 “(b) **BIENNIAL REVIEW.**—The Secretary shall enter  
19 into an arrangement with a competitively selected non-  
20 governmental entity, such as the National Academy of  
21 Sciences, under which the entity will review the program  
22 under sections 103 and 104 every other year, beginning  
23 two years after the date of enactment of the George E.  
24 Brown, Jr. and Robert S. Walker Hydrogen Future Act  
25 of 2003. The entity shall review the research priorities,

1 technical milestones, and plans for technology transfer and  
2 evaluate the progress toward achieving them. The Sec-  
3 retary shall transmit each review to the Congress along  
4 with a plan to implement the review's recommendations  
5 or an explanation for the reasons that a recommendation  
6 will not be implemented.

7 **"SEC. 110. MISCELLANEOUS PROVISIONS.**

8       “(a) **DUPLICATION.**—The Secretary shall carry out  
9 the activities of this Act in a manner that avoids unneces-  
10 sary duplication or displacement of, or competition with  
11 private sector activities.

12       “(b) **OTHER GOVERNMENTS.**—In carrying out this  
13 Act, the Secretary may enter into cost-sharing agreements  
14 with Federal, State, or local governments to demonstrate  
15 applications using hydrogen and fuel cells.

16       “(c) **REPRESENTATION.**—The Department may rep-  
17 resent the United States interests with respect to activities  
18 and programs under this Act, in coordination with the De-  
19 partment of Transportation, the National Institute of  
20 Standards and Technology, and other relevant Federal  
21 agencies, before governments and nongovernmental orga-  
22 nizations including—

23               “(1) other Federal, State, regional, and local  
24 governments and their representatives;

1           “(2) industry and its representatives, including  
2           members of the energy and transportation indus-  
3           tries; and

4           “(3) in consultation with the Department of  
5           State, foreign governments and their representatives  
6           including international organizations.

7           “(d) REGULATORY AUTHORITY.—Nothing in this Act  
8           shall be construed to alter the regulatory authority of the  
9           Department.

10   **“SEC. 111. AUTHORIZATION OF APPROPRIATIONS.**

11           “There are authorized to be appropriated to carry out  
12           this Act, in addition to any amounts made available for  
13           these purposes under other Acts—

14           “(1) \$273,500,000 for fiscal year 2004;

15           “(2) \$325,000,000 for fiscal year 2005;

16           “(3) \$375,000,000 for fiscal year 2006;

17           “(4) \$400,000,000 for fiscal year 2007; and

18           “(5) \$425,000,000 for fiscal year 2008.”.

19   **SEC. 183. REPEAL OF HYDROGEN FUTURE ACT OF 1996.**

20           The Hydrogen Future Act of 1996 is repealed.

Page 110, strike lines 17 through 21, and insert the  
following:

21           (b) OFFICE OF SCIENCE ADVISORY COMMITTEES.—

22           (1) UTILIZATION OF EXISTING COMMITTEES.—

23           The Secretary shall continue to use the scientific

1 program advisory committees chartered under the  
2 Federal Advisory Committee Act by the Office of  
3 Science to oversee research and development pro-  
4 grams under that Office.

5 (2) SCIENCE ADVISORY COMMITTEE.—

6 (A) ESTABLISHMENT.—There shall be in  
7 the Office of Science a Science Advisory Com-  
8 mittee that includes the chairs of each of the  
9 advisory committees described in paragraph (1).

10 (B) RESPONSIBILITIES.—The Science Ad-  
11 visory Committee shall—

12 (i) serve as the science advisor to the  
13 Assistant Secretary for Science created  
14 under section 209 of the Department of  
15 Energy Organization Act, as added by sec-  
16 tion 201 of this Act;

17 (ii) advise the Assistant Secretary  
18 with respect to the well-being and manage-  
19 ment of the National Laboratories and sin-  
20 gle-purpose research facilities;

21 (iii) advise the Assistant Secretary  
22 with respect to education and workforce  
23 training activities required for effective  
24 short-term and long-term basic and applied

1 research activities of the Office of Science;  
2 and  
3 (iv) advise the Assistant Secretary  
4 with respect to the well being of the uni-  
5 versity research programs supported by the  
6 Office of Science.

Page 111, lines 5 and 6, strike "section 102" and insert "section 3".

Page 111, line 12, strike "section 102" and insert "section 3".

Page 113, line 5, through page 120, line 4, strike section 186.

Page 123, line 5, strike "a study" and insert "studies".

Page 123, lines 6 through 8, amend subparagraph (A) to read as follows:

7 (A) the obstacles to accelerating the com-  
8 mercial application of energy technology; and

Page 123, line 15, strike "study" and insert "studies".

Page 126, after line 2, insert the following new section:

1 **SEC. 194. UNIVERSITY COLLABORATION.**

2 Not later than 2 years after the date of enactment  
 3 of this Act, the Secretary shall transmit to the Congress  
 4 a report that examines the feasibility of promoting collabo-  
 5 rations between large institutions of higher education and  
 6 small institutions of higher education through grants, con-  
 7 tracts, and cooperative agreements made by the Secretary  
 8 for energy projects. The Secretary shall also consider pro-  
 9 viding incentives for the inclusion of small institutions of  
 10 higher education, including minority-serving institutions,  
 11 in energy research grants, contracts, and cooperative  
 12 agreements.

Page 128, after line 13, insert the following new sec-  
 tion:

13 **SEC. 202. REPORT ON EQUAL EMPLOYMENT OPPORTUNITY**  
 14 **PRACTICES.**

15 The Secretary shall transmit to the Congress a bien-  
 16 nial report on the equal employment opportunity practices  
 17 at the nonmilitary energy laboratories. Such report shall  
 18 include—

- 19 (1) a thorough review of each nonmilitary en-  
 20 ergy laboratory contractor's equal employment op-  
 21 portunity policies;
- 22 (2) a statistical report on complaints and their  
 23 disposition in the laboratories;

1 (3) the role equal employment opportunity prac-  
2 tices play in selecting the contractor for each labora-  
3 tory, and in establishing the fee that is paid to the  
4 contractor for each laboratory;

5 (4) a summary of disciplinary actions by either  
6 the Department or the relevant contractors for each  
7 laboratory; and

8 (5) a summary of efforts by the Department  
9 and the relevant contractors for each laboratory to  
10 attract women and minorities to the laboratories.

Page 135, line 10, strike "303" and insert "304".

Page 135, after line 21, insert the following new sec-  
tion and redesignate the subsequent section accordingly:

11 **SEC. 303. DIESEL RETROFIT PROGRAM.**

12 (a) **ESTABLISHMENT.**—The Administrator of the En-  
13 vironmental Protection Agency and the Secretary shall es-  
14 tablish a pilot program for awarding grants on a competi-  
15 tive basis to eligible recipients for the demonstration and  
16 commercial application of retrofit technologies for diesel  
17 school buses.

18 (b) **ELIGIBLE RECIPIENTS.**—A grant shall be award-  
19 ed under this section only—

1 (1) to a local or State governmental entity re-  
 2 sponsible for providing school bus service to one or  
 3 more public school systems; or

4 (2) to a contracting entity that provides school  
 5 bus service to one or more public school systems, if  
 6 the grant application is submitted jointly with the  
 7 school system or systems which the buses will serve.

8 (c) CONDITIONS OF GRANT.—A grant provided under  
 9 this section may be used only to demonstrate the use of  
 10 retrofit emissions-control technology on diesel buses  
 11 that—

12 (1) operate on ultra-low sulfur diesel fuel; and

13 (2) were manufactured in model year 1991 or  
 14 later.

15 (d) VERIFICATION.—Not later than 3 months after  
 16 the date of enactment of this Act, the Administrator shall  
 17 publish in the Federal Register procedures to verify—

18 (1) the retrofit emissions-control technology to  
 19 be demonstrated; and

20 (2) that buses on which retrofit emissions-con-  
 21 trol technology are to be demonstrated will operate  
 22 on diesel fuel containing not more than 15 parts per  
 23 million of sulfur.

Page 135, line 23, insert “(a) SCHOOL BUS  
 GRANTS.—” before “There are”.

Page 136, strike line 1, and redesignate the subsequent paragraphs accordingly.

Page 136, line 2, strike "\$70,000,000" and insert "\$90,000,000".

Page 136, line 3, strike "\$80,000,000" and insert "\$100,000,000".

Page 136, line 4, strike "\$90,000,000" and insert "\$110,000,000".

Page 136, after line 4, insert the following new subsection:

1       (b) RETROFIT GRANTS.—There are authorized to be  
2 appropriated to the Administrator of the Environmental  
3 Protection Agency and the Secretary such sums as may  
4 be necessary for carrying out section 303.

Page 136, lines 20 through 25, amend paragraph (2) to read as follows:

5       (2) FUEL CELL VEHICLE.—The term "fuel cell  
6 vehicle" means a vehicle propelled by an electric  
7 motor powered by a fuel cell system that converts  
8 chemical energy into electricity by combining oxygen  
9 (from air) with hydrogen fuel that is stored on the  
10 vehicle or is produced onboard by reformation of a  
11 hydrocarbon fuel. Such fuel cell system may or may

1 not include the use of auxiliary energy storage sys-  
2 tems to enhance vehicle performance.

Page 137, lines 1 through 5, amend paragraph (3)  
to read as follows:

3 (3) HYBRID VEHICLE.—The term “hybrid vehi-  
4 cle” means a medium or heavy duty vehicle that is  
5 more efficient than its non-hybrid counterpart and  
6 that draws propulsion energy from both an internal  
7 combustion engine using any combustible fuel and  
8 an onboard energy storage device.

Page 137, line 8, strike “that qualifies as both” and  
insert “capable of traveling at speeds of 25 miles per  
hour that is”.

Page 137, line 11, strike “and”.

Page 137, line 14, strike the period and insert ”;  
and”.

Page 137, after line 14, insert the following new  
subparagraph:

9 (C) otherwise lawful to use on local streets.

Page 137, line 20, strike “2004” and insert “2003”.

Page 140, lines 2 and 3, strike “alternative fueled vehicle, fuel cell vehicle, or hybrid vehicle” and insert “alternative fueled vehicle or fuel cell vehicle”.

Page 144, line 14, strike “this title” and insert “the pilot program”.

Page 145, line 11, redesignate section 404 as section 405.

Page 145, after line 10, insert the following new section:

1 **SEC. 404. FUEL CELL TRANSIT BUS DEMONSTRATION.**

2 The Secretary shall establish a transit bus dem-  
3 onstration program to make competitive, merit-based  
4 awards for five-year projects to demonstrate not more  
5 than 12 fuel cell transit buses (and necessary infrastruc-  
6 ture) in three geographically dispersed localities. In select-  
7 ing projects under this section, the Secretary shall give  
8 preference to projects that are most likely to mitigate con-  
9 gestion and improve air quality.

Page 145, line 25, strike “2003” and insert “2005”.

Page 146, line 23, strike “2003” and insert “2005”.

Page 147, line 6, strike “operation or have been demonstrated” and insert “commercial service or have been demonstrated on a scale that the Secretary deter-

mines is sufficient to demonstrate that commercial service is viable”.

Page 148, line 8, strike “57” and insert “50”.

Page 148, after line 9, insert the following new subparagraph:

1           (C) Beginning in fiscal year 2009, the Secretary  
2           may use funds under this paragraph for a  
3           project that does not meet the criteria described in  
4           subparagraph (A), but only if—

5                 (i) the Secretary finds that the project is  
6                 likely to result in greater emissions reductions  
7                 than would a project funded pursuant to sub-  
8                 paragraph (A);

9                 (ii) the Secretary finds that the project  
10                would permit (but not necessarily include) the  
11                activities described in paragraph (5); and

12               (iii) the Secretary notifies the Congress of  
13                the project at the time when it is approved.

Page 149, line 3, strike “42” and insert “40”.

Amendment to H.R. 238  
Offered by Mr. Wu

Page 37, after line 19, insert the following :

**Part 4 ---GENERAL PROVISIONS**

**Sec. 116. DEFINITIONS.**

For purposes of this subtitle---

- (1) the term “hybrid distributed power system” means a system using 2 or more distributed power sources, operated together with associated supporting equipment, including storage equipment, and software necessary to provide electric power onsite and to an electric distribution system; and
- (2) the term “distributed power source” means an independent electric energy source of usually 10 megawatts or less located close to a residential, commercial, or industrial load center, including---
  - (A) reciprocating engines;
  - (B) turbines;
  - (C) microturbines;
  - (D) fuel cells;
  - (E) solar electric systems;

- (F) wind energy systems;
- (G) biopower systems;
- (H) geothermal power systems; or
- (I) combined heat and power systems.

**Sec. 117. VOLUNTARY CONSENSUS STANDARDS.**

In a manner consistent with the National Technology Transfer Advancement Act, the Secretary, in consultation with the National Institute of Standards and Technology, shall work with the Institute of Electrical and Electronic Engineers and other standards development organizations to take all appropriate steps towards the development, promulgation, and implementation of voluntary consensus standards for distributed energy systems for use in manufacturing and using equipment and systems for connection with electric distribution systems, for obtaining electricity from, or providing electricity to, such systems.

Amendment Offered by Ms. Johnson to the Boehlert/Hall

En Bloc Amendment

On Page 33, after line 14, add the following new paragraph:

"(3) To enable by 2020 the safe and convenient commercial production and delivery of hydrogen that will have—

(A) The capacity to meet the demand for stationary and mobile hydrogen fuel cells;

(B) safety and performance characteristics comparable to other fuels; and

(C) improved overall efficiency and zero or near-zero emissions when compared to fuels used in 2003."

AMENDMENT OFFERED BY MR. SHERMAN AND MR. BELL  
TO THE AMENDMENTS OFFERED BY MR. BOEHLERT

In the proposed section 169(b), strike (5) and insert the following:

(5) ensure that societal and ethical concerns will be addressed as the technology is developed by –

(A) establishing a research program to identify societal and ethical concerns related to nanotechnology, and ensuring that the results of such research are widely disseminated; ~~Research conducted under this program shall include such topics as: environmental impact studies; toxicology studies; potential implications of human performance enhancement; and potential implications of self-aware, non-human intelligence; and~~

(B) integrating, insofar as possible, research on societal and ethical concerns with nanotechnology research and development.

In the proposed section 169, add at the end the following new subsection:

(d) REPORT.-Within 2 years after the date of enactment of this Act, the Secretary shall transmit to the Congress a report describing the projects to identify societal and ethical concerns related to nanotechnology and the funding provided to support these projects.