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111TH CONGRESS, 1st Session } HOUSE OF REPRESENTATIVES { REPORT 111–302

SOLAR TECHNOLOGY ROADMAP ACT

OCTOBER 15, 2009.—Committed to the Committee of the Whole House on the State of the Union and ordered to be printed

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

R E P O R T

together with

ADDITIONAL VIEWS

[To accompany H.R. 3585]

[Including cost estimate of the Congressional Budget Office]

The Committee on Science and Technology, to whom was referred the bill (H.R. 3585) to guide and provide for United States research, development, and demonstration of solar energy technologies, and for other purposes, having considered the same, report favorably thereon with an amendment and recommend that the bill as amended do pass.

CONTENTS

		Page
I.	Bill	2
II.	Purpose of the Bill	7
III.	Background and Need for the Legislation	7
IV.	Hearing Summary	9
V.	Committee Actions	10
VI.	Summary of Major Provisions of the Bill	11
VII.	Section-by-Section Analysis	12
VIII.	Committee Views	14
IX.	Cost Estimate	15
X.	Congressional Budget Office Cost Estimate	16
XI.	Compliance with Public Law 104–4	17
XII.	Committee Oversight Findings and Recommendations	17
XIII.	Statement on General Performance Goals and Objectives	17
XIV.	Constitutional Authority Statement	18
XV.	Federal Advisory Committee Statement	18
XVI.	Congressional Accountability Act	18
XVII.	Earmark Identification	18
XVIII.	Statement on Preemption of State, Local, or Tribal Law	18
XIX.	Changes in Existing Law Made by the Bill, as Reported	18
XX.	Committee Recommendations	36

89–006

XXI. Proceedings of the Subcommittee Markup 37
XXII. Proceedings of the Full Committee Markup 77
XXIII. Additional Views 160

I. BILL

The amendment is as follows:

Strike all after the enacting clause and insert the following:

SECTION 1. SHORT TITLE.

This Act may be cited as the "Solar Technology Roadmap Act".

SEC. 2. DEFINITIONS.

In this Act:

(1) SECRETARY.—The term "Secretary" means the Secretary of Energy.

(2) SOLAR TECHNOLOGY.—The term "solar technology" means—

(A) photovoltaic technologies, including technologies utilizing—

(i) crystalline silicon;

(ii) cadmium telluride;

(iii) semiconductor materials containing copper, indium, and selenium;

(iv) thin film silicon;

(v) gallium arsenide alloy and multijunctions;

(vi) dye-sensitized and organic solar cell technologies;

(vii) concentrating photovoltaics; and

(viii) other photovoltaic methods identified by the Secretary;

(B) solar thermal electric technology, including linear concentrator systems, dish/engine systems, and power tower systems;

(C) solar thermal water heating technology;

(D) solar heating and air conditioning technologies;

(E) passive solar design in architecture, including both heating and lighting applications; and

(F) related or enabling technologies, including thin films, semiconducting materials, transparent conductors, optics, and technologies that increase durability or decrease cost or weight.

TITLE I—SOLAR TECHNOLOGY RESEARCH, DEVELOPMENT, AND DEMONSTRATION

SEC. 101. PROGRAM.

(a) IN GENERAL.—The Secretary shall conduct a program of research, development, and demonstration for solar technology, including—

(1) photovoltaics;

(2) solar hot water and solar space heating and cooling;

(3) concentrating solar power;

(4) lighting systems that integrate sunlight and electrical lighting in complement to each other in common lighting fixtures for the purpose of improving energy efficiency;

(5) manufacturability of low cost, high-quality solar energy systems;

(6) development of solar technology products that can be easily integrated into new and existing buildings; and

(7) other areas as the Secretary considers appropriate.

(b) AWARDS.—The Secretary shall provide awards under this section to promote a diversity of research, development, and demonstration activities for solar technology on a merit-reviewed, competitive basis to—

(1) academic institutions, national laboratories, Federal research agencies, State research agencies, nonprofit research organizations, industrial entities, or consortia thereof for research, development, and demonstration activities; and

(2) industry-led consortia for research, development, and demonstration of advanced techniques for manufacturing a variety of solar energy products.

(c) SENSE OF CONGRESS.—It is the sense of Congress that at least 75 percent of funding for solar technology research, development, and demonstration activities conducted by the Department of Energy after fiscal year 2014 support a diversity of activities identified by and recommended under the Solar Technology Roadmap as described in section 102.

(d) SPECIAL CONSIDERATION.—As a criteria for providing awards under this Act, the Secretary shall consider areas with high unemployment.

(e) COMPETITIVENESS.—In carrying out section 105, the Department of Energy shall strongly consider projects utilizing solar technologies manufactured in the United States.

SEC. 102. SOLAR TECHNOLOGY ROADMAP.

(a) IN GENERAL.—Not later than 18 months after the date of enactment of this Act, the Solar Technology Roadmap Committee established under section 103 shall develop and transmit to the Secretary of Energy and the Congress a Solar Technology Roadmap that—

(1) presents the best current estimate of the near-term (up to 2 years), mid-term (up to 7 years), and long-term (up to 15 years) research, development, and demonstration needs in solar technology; and

(2) provides guidance to the solar technology research, development, and demonstration activities supported by the Federal Government for the purposes of meeting national priorities in energy security, United States competitiveness, mitigation of adverse environmental impacts, and energy diversification.

(b) CONTENTS.—The Solar Technology Roadmap shall—

(1) identify research, development, and demonstration needs for a diversity of solar technologies to address—

(A) the key solar energy production challenges of intermittency, transience, storage, and scaling, including determining—

(i) which solar-related technological solutions are appropriate for various applications, locations, and seasons;

(ii) how to store excess solar energy in batteries, supercapacitors, compressed air, flywheels, hydrogen, synthetic fuels, thermal storage, or superconductors, or through other means;

(iii) how and when to integrate solar energy into the electricity grid effectively, including—

(I) the integration of solar technologies with a Smart Grid;

(II) electrical power smoothing;

(III) microgrid integration;

(IV) solar resource forecasting;

(V) long distance transmission options, including direct current and superconducting transmission; and

(VI) ways to address arbitrage over minutes, hours, days, weeks, and seasons with respect to the full range of project scales; and

(iv) how best to integrate solar technologies into buildings;

(B) modeling and simulation;

(C) the design, materials, and manufacture of solar technologies, as well as related factory sciences;

(D) the development of standards;

(E) the need for demonstration facilities;

(F) optimized packaging methods;

(G) environmental, safety, and health concerns including reuse, recycling, hazardous materials disposal, and photovoltaic waste issues; and

(H) other areas identified by the Secretary;

(2) identify opportunities for coordination with partner industries such as those for semiconductors, lighting, energy storage, Smart Grid, and wind that can benefit from similar advances;

(3) establish research, development, and demonstration goals with recommended timeframes with respect to solar technologies for—

(A) improving performance;

(B) decreasing cost of electricity generated;

(C) improving reliability; and

(D) decreasing potential negative environmental impacts and maximizing the environmental benefits of solar technologies;

(4) include recommendations, as appropriate, to guide solar technology research, development, and demonstration activities; and

(5) outline the various technologies and practices considered by the Committee and the benefits and shortcomings of each, as appropriate.

(c) REVISIONS AND UPDATES.—

(1) REVISIONS.—Once every 3 years after completion of the first Solar Technology Roadmap under this Act, the Solar Technology Roadmap Committee shall conduct a comprehensive review and revision of the Solar Technology Roadmap.

(2) UPDATES.—The Solar Technology Roadmap Committee shall update the Solar Technology Roadmap annually as necessary.

SEC. 103. SOLAR TECHNOLOGY ROADMAP COMMITTEE.

(a) ESTABLISHMENT.—Not later than 4 months after the date of enactment of this Act, the Secretary shall establish, and provide support for as necessary, a Solar Technology Roadmap Committee.

(b) MEMBERSHIP.—

(1) IN GENERAL.—The Solar Technology Roadmap Committee shall consist of at least 11 members. Each member shall be appointed by the Secretary from among subject matter experts representing—

(A) different sectors of the domestic solar technology industry, including manufacturers and equipment suppliers;

(B) national laboratories;

(C) academia;

(D) relevant Federal agencies;

(E) relevant State and local government entities;

(F) private research institutions; and

(G) other entities or organizations, as appropriate.

(2) TERMS.—

(A) IN GENERAL.—Except as provided in subparagraph (B), the term of a member of the Solar Technology Roadmap Committee shall be 3 years.

(B) ORIGINAL TERMS.—Of the members appointed originally to the Solar Technology Roadmap Committee, approximately ⅓ shall be appointed for a 2-year term, approximately ⅓ shall be appointed for a 3-year term, and approximately ⅓ shall be appointed for a 4-year term.

(3) LIMIT ON TERMS.—A member of the Solar Technology Roadmap Committee may serve more than 1 term, except that such member may not serve a subsequent term unless 2 years have elapsed since the end of a previous term.

(4) INDUSTRY PARTICIPATION.—At least ⅓ and not more than ½ of the members of the Solar Technology Roadmap Committee shall be individuals described in paragraph (1)(A).

(5) CHAIR.—The Secretary shall select a Chair from among the members of the Committee. The Chair shall not be an employee of the Federal Government.

(6) CONFLICTS OF INTEREST.—The Secretary, in appointing members to the Committee, shall make every effort to ensure that—

(A) no individual appointed to serve on the Committee has a conflict of interest that is relevant to the functions to be performed, unless such conflict is promptly and publicly disclosed and the Secretary determines that a waiver is appropriate;

(B) the Committee membership is fairly balanced as determined by the Secretary to be appropriate for the functions to be performed; and

(C) the final report of the Committee will be the result of the Committee's independent judgment.

The Secretary shall require that individuals that are appointed or intended to be to appointed to serve on the Committee inform the Department of Energy of any individual's conflicts of interest that are relevant to the functions to be performed.

(c) EXPERT ADVICE.—In developing the Solar Technology Roadmap, the Solar Technology Roadmap Committee may establish subcommittees, working groups comprised of experts outside the membership of the Solar Technology Roadmap Committee, and other means of gathering expert advice on—

(1) particular solar technologies or technological challenges;

(2) crosscutting issues or activities relating to more than 1 particular solar technology or technological challenge; or

(3) any other area the Solar Technology Roadmap Committee considers appropriate.

(d) COMPENSATION AND EXPENSES.—A member of the Solar Technology Roadmap Committee shall not be compensated for service on the Committee, but may be allowed travel expenses, including per diem in lieu of subsistence, in accordance with subchapter I of chapter 57 of title 5, United States Code.

(e) FEDERAL ADVISORY COMMITTEE ACT.—The Federal Advisory Committee Act (5 U.S.C. App.) shall not apply to the Solar Technology Roadmap Committee.

SEC. 104. INTERAGENCY COORDINATION.

The Director of the Office of Science and Technology Policy shall review and coordinate Federal interagency activities identified in and related to the Solar Technology Roadmap as appropriate.

SEC. 105. SOLAR TECHNOLOGY DEMONSTRATION PROJECTS.

(a) ESTABLISHMENT OF PROGRAM.—The Secretary shall establish a program to provide grants for demonstration projects to support the development of solar energy production, consistent with the Solar Technology Roadmap as available.

(b) IMPLEMENTATION.—In carrying out the demonstration program under this section, to the extent practicable, the Secretary shall—

(1) include at least 10 photovoltaic technology projects that generate between 1 and 3 megawatts;

(2) include at least 3 but not more than 5 solar technology projects that generate greater than 30 megawatts; and

(3) make awards for projects that—

(A) are located and can be replicated at a wide range of sites;

(B) are located and can be replicated in a variety of regions and climates;

(C) demonstrate technologies that address intermittency, transience, storage challenges, and independent operational capability;

(D) facilitate identification of optimum techniques among competing alternatives;

(E) include business commercialization plans that have the potential for production of equipment at high volumes;

(F) improve United States competitiveness and lead to development of manufacturing technology;

(G) demonstrate positive environmental performance through life-cycle analysis;

(H) provide the greatest potential to reduce energy costs for consumers;

(I) promote overall electric infrastructure reliability and sustainability should grid functions be disrupted or damaged; and

(J) satisfy other criteria that the Secretary considers necessary to carry out the program.

(c) GRANT AWARDS.—Funding provided under this section may be used, to the extent that funding is not otherwise available through other Federal programs or power purchase agreements, for—

(1) a necessary and appropriate site engineering study;

(2) a detailed economic assessment of site-specific conditions;

(3) appropriate feasibility studies to determine whether the demonstration can be replicated;

(4) installation of equipment, service, and support;

(5) operation for a minimum of 3 years and monitoring for the duration of the demonstration; and

(6) validation of technical, economic, and environmental assumptions and documentation of lessons learned.

(d) GRANT SELECTION.—Not later than 90 days after the date of enactment of this Act and annually thereafter, the Secretary shall conduct a national solicitation for applications for grants under this section. Grant recipients shall be selected on a merit-reviewed, competitive basis. The Secretary shall give preference to proposals that address multiple elements described in subsection (b).

(e) LIMITATIONS.—Funding shall not be provided under this section for more than 50 percent of the costs of the project for which assistance is provided. Not more than a total of $300,000,000 shall be provided under this section for the period encompassing fiscal years 2011 through 2015.

SEC. 106. PHOTOVOLTAIC PERFORMANCE STUDY.

(a) IN GENERAL.—Not later than one year after the date of enactment of this Act, the Secretary shall transmit to the Congress and the Solar Technology Roadmap Committee the results of a study that analyzes the performance of photovoltaic installations in the United States. The study shall assess the current performance of photovoltaic installations and identify opportunities to improve the energy productivity of these systems. Such study shall include—

(1) identification of the average energy productivity of current commercial and residential installations;

(2) assessment of areas where energy productivity is reduced, including wire loss, module mismatch, shading, dust, and other factors;

(3) identification of technology development and technical standards that improve energy productivity;

(4) analysis of the potential cost savings and energy productivity gains to the Federal, State, and local governments, utilities, private enterprise, and consumers available through the adoption, installation, and use of high-performance photovoltaic technologies and practices; and

(5) an overview of current government incentives at the Federal, State, and local levels that encourage the adoption of highly efficient photovoltaic systems and practices.

(b) PUBLIC INPUT.—The Secretary shall ensure that interested stakeholders, including affected industry stakeholders and energy efficiency advocates, have a meaningful opportunity to provide comments, data, and other information on the

scope, contents, and conclusions of the study. All forums for the Department to receive this input from interested stakeholders shall be announced in the Federal Register.

SEC. 107. SOLAR ENERGY PROGRAM REAUTHORIZATION.

(a) IN GENERAL.—There are authorized to be appropriated to the Secretary to carry out section 101(a)—

(1) $350,000,000 for fiscal year 2011;
(2) $400,000,000 for fiscal year 2012;
(3) $450,000,000 for fiscal year 2013;
(4) $500,000,000 for fiscal year 2014; and
(5) $550,000,000 for fiscal year 2015.

(b) ROADMAP IDENTIFIED ACTIVITIES.—The Secretary shall dedicate a percentage of funding received pursuant to subsection (a) for research, development, and demonstration activities identified by and recommended under the Solar Technology Roadmap in the following percentages:

(1) For fiscal year 2012, at least 30 percent.
(2) For fiscal year 2013, at least 45 percent.
(3) For fiscal year 2014, at least 60 percent.
(4) For fiscal year 2015, at least 75 percent.

(c) SOLAR TECHNOLOGY ROADMAP.—The Secretary may use up to $2,000,000 of the funds appropriated pursuant to subsection (a) for each fiscal year to support the establishment and maintenance of the Solar Technology Roadmap.

(d) EXTENSION OF AUTHORIZATIONS.—Of funds authorized by subsection (a), there are authorized to be appropriated to the Secretary to carry out—

(1) section 602 of the Energy Independence and Security Act of 2007 (42 U.S.C. 17171) $12,000,000 for each of the fiscal years 2013 through 2015;
(2) section 604 of the Energy Independence and Security Act of 2007 (42 U.S.C. 17172) $10,000,000 for each of the fiscal years 2013 through 2015;
(3) section 605 of the Energy Independence and Security Act of 2007 (42 U.S.C. 17173) $3,500,000 for each of the fiscal years 2013 through 2015; and
(4) section 606 of the Energy Independence and Security Act of 2007 (42 U.S.C. 17174) $2,500,000 for each of the fiscal years 2013 through 2015.

SEC. 108. EXISTING PROGRAMS.

Except as otherwise specified in this Act, this Act shall supersede any duplicative solar research, development, and demonstration programs within the Department of Energy.

SEC. 109. REPEALS.

The following are hereby repealed:

(1) The Solar Energy Research, Development, and Demonstration Act of 1974 (42 U.S.C. 5551 et seq.), except for section 10.
(2) The Solar Photovoltaic Energy Research, Development, and Demonstration Act of 1978 (42 U.S.C. 5581 et seq.).
(3) Section 4(a)(2) and (3) of the Renewable Energy and Energy Efficiency Technology Competitiveness Act of 1989 (42 U.S.C. 12003(a)(2) and (3)).

TITLE II—PHOTOVOLTAIC RECYCLING

SEC. 201. PHOTOVOLTAIC DEVICE RECYCLING RESEARCH, DEVELOPMENT, AND DEMONSTRATION.

(a) DEFINITION.—In this section, the term "photovoltaic device" includes photovoltaic cells and the electronic and electrical components of such devices.

(b) IN GENERAL.—In order to address the issues described in section 102(b)(1)(G), the Secretary shall award multiyear grants for research, development, and demonstration activities to create innovative and practical approaches to increase reuse and recycling of photovoltaic devices and, through such activities, to contribute to the professional development of scientists, engineers, and technicians in the fields of photovoltaic and electronic device manufacturing, design, refurbishing, and recycling. The activities supported under this section shall address—

(1) technology to increase the efficiency of photovoltaic device recycling and maximize the recovery of valuable raw materials for use in new products while minimizing the life-cycle environmental impacts such as greenhouse gas emissions and water usage;
(2) expanded uses for materials from recycled photovoltaic devices;
(3) development and demonstration of environmentally responsible alternatives to the use of hazardous materials in photovoltaic devices and the production of such devices;

(4) development of methods to separate and remove hazardous materials from photovoltaic devices and to recycle or dispose of those materials in a safe manner;

(5) product design and construction to facilitate disassembly and recycling of photovoltaic devices;

(6) tools and methods to aid in assessing the environmental impacts of the production of photovoltaic devices and photovoltaic device recycling and disposal;

(7) product design and construction and other tools and techniques to extend the life cycle of photovoltaic devices, including methods to promote their safe reuse;

(8) strategies to increase consumer acceptance and practice of recycling of photovoltaic devices; and

(9) processes to reduce the costs and environmental impact of disposal of toxic materials used in photovoltaic devices.

(c) MERIT REVIEW.—Grants shall be awarded under this section on a merit-reviewed, competitive basis.

(d) APPLICATIONS.—Each application shall include a description of—

(1) the project that will be undertaken and the contributions of each participating entity;

(2) the applicability of the project to increasing reuse and recycling of photovoltaic devices with the least environmental impacts as measured by life-cycle analyses, and the potential for incorporating the research results into industry practice; and

(3) how the project will promote collaboration among scientists and engineers from different disciplines, such as electrical engineering, materials science, and social science.

(e) DISSEMINATION OF RESULTS.—The results of activities supported under this section shall be made publicly available through—

(1) development of best practices or training materials for use in the photovoltaics manufacturing, design, refurbishing, or recycling industries;

(2) dissemination at industry conferences;

(3) coordination with information dissemination programs relating to recycling of electronic devices in general;

(4) demonstration projects; and

(5) educational materials for the public produced in conjunction with State and local governments or nonprofit research organizations on the problems and solutions related to reuse and recycling of photovoltaic devices.

(f) PHOTOVOLTAIC MATERIALS PHYSICAL PROPERTY DATABASE.—

(1) IN GENERAL.—The Secretary shall establish a comprehensive physical property database of materials for use in photovoltaic devices. This database shall include—

(A) identification of materials used in photovoltaic devices;

(B) a list of commercially available amounts of these materials;

(C) amounts of these materials projected to be available through mining or recycling of photovoltaic and other electronic devices; and

(D) a list of other significant uses for each of these materials.

(2) PRIORITIES.—The Secretary, working with private industry, shall develop a plan to establish priorities and requirements for the database under this subsection, including the protection of proprietary information, trade secrets, and other confidential business information.

(3) COORDINATION.—The Secretary shall coordinate with the Director of the National Institute of Standards and Technology and the Administrator of the Environmental Protection Agency to facilitate the incorporation of the database under this subsection with any existing database for electronic manufacturing and recycling.

II. PURPOSE

The purpose of H.R. 3585, sponsored by Rep. Giffords, is to authorize a comprehensive research, development, and demonstration program to advance solar energy technologies.

III. BACKGROUND AND NEED FOR THE LEGISLATION

Solar energy constitutes the largest global energy resource. Currently the Bureau of Land Management (BLM) has 158 active solar applications, covering 1.8 million acres with a projected capacity to

generate 97,000 megawatts of electricity on the public lands that have been fast-tracked for renewable energy development in six western states. These BLM solar projects could provide the equivalent of 29 percent of the nation's household electricity use. In addition, the United States Geological Survey (USGS) estimates that 48 percent of total water withdrawals in 2000 were used for electric power generation. The combination of environmental benefits and government incentives has resulted in a boom in the growth of applications for solar energy projects on public and private lands and on residential, commercial, and municipal sites. An array of solar technologies are currently available for use in lighting, heating, and cooling (air or water) as well as to generate electricity on a wide range of scales from the residential level to utility-scale installations.

The solar industry faces a number of challenges to achieving a significant, stable domestic energy supply for U.S. consumers while meeting greenhouse gas emission reduction targets. Reaching these goals will require the coordination of the solar energy technology research and manufacturing supply chains. The U.S. solar industry faces a number of barriers to entry in energy supply markets. Utilities are justifiably risk-averse and need access to best practices and expertise in order to efficiently integrate solar loads especially in urban areas. Some examples of this were identified in the April 2009 NREL publication: Photovoltaic Systems Interconnected onto Secondary Network Distribution Systems—Success Stories. In addition, there are additional opportunities for the solar manufacturing industry to make large gains through technological advancement.

The United States has a long history of leadership in solar energy technology, in part due to the development of photovoltaic technologies for space applications. However, in recent years other nations have come to dominate the solar market through aggressive policy and favorable market conditions. Spain and Germany installed the largest amounts of solar energy capacity in 2007 and 2008. And China, Korea, and Taiwan continue to show significant growth in photovoltaic manufacturing capacity.

To help accelerate the widespread deployment of solar technologies in the U.S., the Administration recently dedicated $118 million in Recovery Act funds to projects administered by the DOE solar program. This program currently has a base annual budget of roughly $200 million.

In reviewing ways to support the long-term growth of a domestic solar manufacturing industry the semiconductor industry may provide a model for partnership on R&D between government and the private sector.

In the case of semiconductors, in the mid-1980s the U.S.—and the Department of Defense in particular—became concerned that Japanese semiconductor manufacturers were limiting access to semiconductor chips for two years or longer, delaying or halting the progress of technological advancement. In order to protect its strategic interest in advancing electronics the U.S. opted to support the growth of a domestic semiconductor industry through support for a semiconductor manufacturing technology research consortium. Sematech was created along with a National Technology Roadmap for Semiconductors.

These two activities brought together key players within the industry, from semiconductor manufacturers to manufacturing equipment builders and members of the semiconductor materials supply chain. This model of coordination and collaboration helped to keep the technology moving forward at a quick pace, encouraged the industry to adopt cost and time-saving standards, and helped to eliminate the duplication of research efforts on pre-competitive technologies through communication and coordination. The U.S. continues to host some of the world's most prominent semiconductor companies including Intel, AMD, National Semiconductor, and Texas Instruments.

By 1994, the U.S. semiconductor industry had grown considerably and expanded its share of the world market for these products. The membership of Sematech voted to end federal matching funds for its activities in that same year and all federal funding for Sematech ended in 1996. During that same time period, Sematech expanded its membership to include non-U.S. manufacturers and it continues to serve the industry as a global consortium supporting collaborative research.

In late April 2009, the National Academies organized a meeting on "The Future of Photovoltaic Manufacturing in the U.S." At this meeting a large number of industry players including DuPont, Dow Corning, FirstSolar, SunPower, Applied Materials, and IBM expressed the view that the photovoltaic industry needed to develop a comprehensive R&D agenda in order to grow the industry. They also suggested the government could facilitate these activities.

While there are American solar companies that have emerged as strong players in the world solar market, they do not have the resources to individually support long-term research, development, and commercial application of new solar technologies while sustaining rapid growth and expanding production capacity. Additionally, significant obstacles in the approval process for siting, constructing and operating new solar facilities has further stymied industry's pursuit of cutting edge technological advances. A jointly-developed comprehensive solar technology plan with public and private support may provide a framework for strengthening U.S. leadership in renewable energy technology.

IV. Hearing Summary

The Energy and Environment Subcommittee held a hearing in the 111th Congress on July 14, 2009 to receive testimony on solar as well as wind research activities supported by the Department of Energy. Witnesses included:

Mr. Steve Lockard, CEO of TPI Composites and co-chair of the American Wind Energy Association (AWEA) Research & Development Committee

Mr. John Saintcross, Energy and Environmental Markets Program Manager, New York State Energy Research and Development Authority

Prof. Andrew Swift, Director of the Wind Science and Engineering Research Center at Texas Tech University

Mr. Ken Zweibel, Director of the George Washington University Solar Institute

Ms. Nancy Bacon, Senior Advisor for United Solar Ovonic and Energy Conversion Devices, Inc.

The hearing examined the need for a comprehensive roadmapping process for solar research, development, and demonstration activities from the perspective of the solar industry, government, and academic institutions.

Mr. Zweibel and Ms. Bacon spoke in strong support of creating a solar technology roadmap with substantial input from both the public and private sectors. Mr. Zweibel stated that "if we do not try to connect our solar technology development in government with our deployment expectations, we will be doing ourselves a disservice, paying more and perhaps much more than we would otherwise for the same solar electricity. In addition, we have a responsibility to maximize our domestic competitiveness in solar, since solar can provide a huge harvest of jobs." He also noted that the roadmap must be developed and adopted "with openness to frequent revision."

Ms. Bacon noted that a joint roadmap "is an excellent vehicle to help achieve the Subcommittee's and the Administration's goals." She stated that while industry will clearly play a vital role in developing such a roadmap, "no solar company is large enough to bear the financial burden of doing research all along the supply chain in an efficient manner. There are areas where collaboration makes sense and we and others in the industry support working with academia, national labs and each other . . . DOE in coordination with other agencies of the federal government and industry can play an important role as a neutral party that can facilitate communication and support along the research, development and commercialization path to reduce the costs of solar systems and help advance solar photovoltaic technology and processes to make domestically manufactured solar systems accessible and affordable across the country."

V. Committee Actions

The Subcommittee on Energy and Environment met to consider H.R. 3585 on September 30, 2009.

Mr. Bartlett offered an amendment to extend authorizations in Sections 605 and 606 of the Energy Independence and Security Act of 2007 for research and development in direct solar lighting systems and solar air conditioning. The amendment was agreed to by voice vote.

Mr. Baird moved that the Subcommittee favorably report H.R. 3585, as amended, to the Full Committee. The motion was agreed to by voice vote.

The full Committee on Science and Technology met to consider H.R. 3585 on Wednesday, October 7, 2009.

Ms. Giffords offered a manager's amendment to make several technical and clarifying changes. The amendment also adds language to address potential issues of conflict of interest among members of the Solar Technology Roadmap Committee. The amendment was agreed to by voice vote.

Mr. Peters offered an amendment ensure that the United States is the primary beneficiary of the activities of the Solar Technology Roadmap Committee. The amendment was agreed to by voice vote.

Mr. Luján offered an amendment to ensure that specific long distance transmission options, including direct current and super-

conducting transmission, are supported in this Act. The amendment was agreed to by voice vote.

Mrs. Biggert offered an amendment to add a sunset to the activities of the Solar Technology Roadmap Committee in 2015. The amendment was defeated by voice vote.

Mrs. Biggert offered an amendment instructing the Department to make awards for demonstration projects that provide the greatest potential to reduce energy costs for consumers. The amendment was agreed to by voice vote.

Mr. Bartlett offered an amendment to increase the number of large demonstration projects, and make instructions to award these projects technology neutral. The amendment also instructs the Secretary to make awards for demonstration projects that promote overall electric infrastructure reliability and sustainability should grid functions be disrupted or damaged. The amendment was agreed to by voice vote.

Mr. Bilbray offered an amendment to ensure that intellectual property issues are respected in the establishment of a photovoltaic materials database. The amendment was agreed to by voice vote.

Mr. Broun offered an amendment to remove the minimum percentage of solar research funding required to follow the recommendations of the Solar Technology Roadmap. The amendment was defeated by voice vote.

Mr. Broun offered an amendment to reduce the authorization levels for the Secretary of Energy to carry out this Act to $200 million for each fiscal year from 2011 through 2013. The amendment was defeated by roll call vote: Yays–6, Nays–19, Present–1.

Mr. Gordon moved that the Committee favorably report the bill, H.R. 3585, as amended, to the House. The motion was agreed to by a voice vote.

VI. Summary of Major Provisions of the Bill

H.R. 3585 directs the Secretary of Energy to conduct a research, development, and demonstration program for solar technology, including photovoltaics, concentrating solar power, solar hot water, solar space heating and cooling, solar lighting, solar manufacturing, integration of solar technology in buildings, and other areas the Secretary considers appropriate. The Secretary is also directed to award grants on a merit-review basis to academic institutions, nonprofit organizations, industrial entities, or consortia thereof for research, development, and demonstration activities.

In addition, the bill directs the Secretary to appoint a Solar Technology Roadmap Committee, comprised of at least 11 members, within four months of enactment of the Act. At least one-third but not more than half of the members of the Committee must come from the solar industry. The Secretary must also appoint a Committee chair, who shall not be a federal government employee.

The bill requires that the Committee create a Solar Technology Roadmap within eighteen months of enactment of the Act. The Roadmap shall present the best current estimate of the near-term (up to two years), mid-term (up to seven years), and long-term (up to 15 years) research, development, and demonstration needs in solar technology. The Roadmap must also provide guidance for solar technology research, development, and demonstration activities supported by the federal government. The bill requires that the

Roadmap: (1) identify research, development, and demonstration needs for solar technology challenges; (2) identify opportunities for coordination with partner industries; and (3) expedite the process of improving solar technologies by identifying research goals that improve performance, decrease the cost of generated electricity, improve reliability, and maximize the environmental benefits of solar technologies.

The bill specifies that interagency activities recommended by the Roadmap be coordinated by the director of the Office of Science and Technology Policy (OSTP). The Committee must update the Roadmap annually as needed, and comprehensively review and revise the Roadmap every three years.

H.R. 3585 authorizes DOE to conduct at least 10 photovoltaic demonstration projects ranging from one-to-three megawatts in size and three-to-five solar projects greater than 30 megawatts in size. DOE is also required to study the performance of photovoltaic installations and identify opportunities to improve the energy productivity of these systems. The bill also establishes a program of research, development, and demonstration related to the reuse, recycling, and safe disposal of photovoltaic devices.

The bill authorizes appropriations of $350,000,000 for FY 2011, $400,000,000 for FY 2012, $450,000,000 for FY 2013, $500,000,000 for FY 2014, and $550,000,000 for 2015 to the Secretary to carry out the activities identified in the bill. $2,000,000 per year of this funding is authorized to support the establishment and maintenance of the Solar Technology Roadmap. The bill also reauthorizes solar research activities established in the Energy Independence and Security Act of 2007.

VII. Section-by-Section Analysis

Sec. 1. Short title

Gives title of the bill as "Solar Technology Roadmap Act"

Sec. 2. Definitions

Provides definitions for "SECRETARY" and "SOLAR TECHNOLOGY"

TITLE I—SOLAR TECHNOLOGY RESEARCH, DEVELOPMENT, AND DEMONSTRATION

Sec. 101. Program

Directs the Secretary of Energy to conduct a research, development, and demonstration program for solar technology, including photovoltaics, concentrating solar power, solar hot water, solar space heating and cooling, solar lighting, solar manufacturing, and integration solar technology in buildings.

Any grants awarded must be merit reviewed. Grants may be awarded to academic institutions, national laboratories, Federal research agencies, state research agencies, nonprofit organizations, industrial entities, or consortia thereof.

Paragraph (c) states that it is the policy of the United States that at least 75% of solar RD&D funding conducted by DOE after 2014 shall support activities identified by and recommended under the Solar Technology Roadmap described in Sec. 102.

Sec. 102. Solar Technology Roadmap

Directs that within 18 months of enactment, the Solar Technology Roadmap Committee (established in Sec. 103) shall create the first Solar Technology Roadmap.

The roadmap shall present the best current estimate of the near-term (up to 2 years), mid-term (up to 7 years), and long-term (up to 15 years) research, development, and demonstration needs in solar technology; and provide(s) guidance to the solar technology research, development, and demonstration activities supported by the Federal Government.

The purposes of the roadmap are:

(1) to identify research, development, and demonstration needs for solar technology challenges;

(2) identify opportunities for coordination with partner industries (such as those for semiconductors, energy storage, Smart Grid, etc.);

(3) and expedite the process of improving solar technologies by identifying research goals that improve performance; decrease cost of electricity generated; improve reliability; and maximize the environmental benefits of solar technologies.

The roadmap is subject to comprehensive revision every 3 years and may be updated annually as needed.

Sec. 103. Solar Technology Roadmap Committee

The Secretary of Energy shall appoint members of the Roadmap Committee within 4 months after enactment.

The Roadmap Committee must contain at least 11 members and the members serve 3-year terms. One-third but not more than one-half of the members of the committee must come from the solar industry. The Secretary chooses the chair, but the chair cannot be a federal government employee.

Sec. 104. Interagency Coordination

Interagency activities identified and recommended by the Solar Technology Roadmap shall be coordinated by the Director of OSTP.

Sec. 105. Solar Technology Demonstration Projects

Authorizes the DOE to conduct at least ten photovoltaic projects ranging from 1 to 3 megawatts in size and 2 to 3 solar projects greater than 30 megawatts in size.

Sec. 106. Photovoltaic Performance Study

DOE shall study and publish best practices to improve performance of photovoltaic installations. The study shall examine the effectiveness of federal, state, and local incentives to enhance system performance.

Sec. 107. Solar Energy Program Reauthorization

Authorizes to be appropriated to the Secretary of Energy to carry out this Act $350,000,000 in FY 2011, $400,000,000 in FY 2012, $450,000,000 in FY 2013, $500,000,000 in FY 2014, and $550,000,000 in FY 2015. Of this funding, $2 million per year is authorized to support the establishment and maintenance of the Solar Technology Roadmap. This section also reauthorizes solar re-

search activities established in the Energy Independence and Security Act of 2007.

Sec. 108. Existing Programs

Except as otherwise specified in this Act, this Act shall supersede any duplicative or conflicting solar RD&D programs within the DOE.

Sec. 109. Repeals

This section repeals outdated solar research legislation from 1974, 1978, and 1989. A provision that is not repealed is Sec. 10 of the Solar Energy Research, Development, and Demonstration Act of 1974, which established the national laboratory that is now NREL.

TITLE II—PHOTOVOLTAIC RECYCLING

Sec. 201. Photovoltaic Device Recycling Research, Development, and Demonstration

This section establishes a program of RD&D in the reuse, recycling, and safe disposal of photovoltaic devices and substances used in the manufacture of such devices.

VIII. Committee Views

The Committee on Science and Technology (henceforth referred to as "the Committee") believes that the U.S. solar industry is at a crossroads, and a strong, comprehensive roadmapping process incorporating the best ideas and greatest needs of both the public and private sectors is critical to reasserting U.S. leadership in this fast-growing energy market. The Committee encourages the Secretary of Energy to appoint a broad representation of stakeholders to serve on the Solar Technology Roadmap Committee (henceforth referred to as "the Roadmap Committee"), including academics, researchers at national laboratories, experts within the Department of Energy (DOE) as well as other agencies, and a mandatory minimum of ⅓ of the Roadmap Committee from the best minds of the domestic solar industry. This requirement of industry participation ensures that the Roadmap Committee will provide recommendations that will be beneficial to the U.S. in the near-term, while a maximum industry participation of ½ of the Roadmap Committee ensures that mid- and long-term needs and opportunities are properly addressed as well. Any conflicts of interest among members of the Roadmap Committee must be publicly disclosed, and the Committee will closely monitor any indication that the Roadmap Committee is not acting in the best interests of the U.S. and our domestic solar industry as a whole.

The Committee believes that having a robust minimum percentage of solar research, development, and demonstration funds that must follow roadmap recommendations—gradually increasing to 75% in 2015—is critical to ensuring that the roadmap process is a serious undertaking by both DOE and the private sector. This roadmap, which will be updated and revised on a regular basis, will be a publicly disclosed blueprint for the future of the U.S. solar research program. Currently, the DOE solar program within the Office of Energy Efficiency and Renewable Energy (EERE) has no re-

quirement to seek advice and guidance outside of the Department. It can, should the Secretary wish, delegate grant award decisions to a single program manager. This roadmap will be a vehicle for comprehensive strategic planning with far more transparency than we have today.

The Committee notes that while the Roadmap Committee is expected to provide recommendations to be carried out by EERE, its recommendations need not be limited to EERE programs. The DOE Office of Science conducts significant basic research programs relevant to solar energy, and should be involved in developing and implementing long-term solar research recommendations. In 2005, the Office of Science produced a report entitled Basic Research Needs for Solar Energy Utilization. The recommendations of this report should be reviewed by the initial Roadmap Committee and incorporated into the first Solar Technology Roadmap as appropriate. Other agencies including the National Science Foundation, the National Institutes of Standards and Technology, the National Aeronautics and Space Administration, and the Department of Defense have all played a role in solar technology development over the past 40 years as well. The Roadmap Committee should seek expertise from and provide recommendations to any agencies that may benefit. The Roadmap Committee is also free to provide recommendations for collective private sector activities as it sees fit.

In carrying out its solar demonstration program, the Committee encourages DOE to collaborate with the Department of Homeland Security, the Department of Defense, and other agencies, where appropriate, to direct projects to locations that carry out vital government functions or missions in order to explore the capability of advanced solar technologies to support critical infrastructure, operations, or missions in the event of a significant grid failure. These demonstration sites should include federally operated facilities as well as private sector facilities that conduct these vital activities. It is not necessary for each demonstration project to meet each of the criteria described in section 105(b)(3), however the set of demonstration projects should meet these criteria, and priority should be given to projects that meet multiple elements of 105(b)(3). The Committee believes that DOE should award demonstration projects utilizing solar technologies manufactured in the United States unless there is strong justification otherwise.

The Committee believes that workforce training and education either at the workplace or at local community colleges and other institutions of higher education will contribute to the professional development of scientists, engineers, and technicians employed by the solar industry.

The Committee supports the fast-tracking of applications to develop renewable energy projects on federal lands. This process should facilitate expedited permitting to accelerate and ensure the deployment of these critical additions to our energy infrastructure.

IX. Cost Estimate

A cost estimate and comparison prepared by the Director of the Congressional Budget Office under section 402 of the Congressional Budget Act of 1974 has been timely submitted to the Committee on Science and Technology prior to the filing of this report and is in-

cluded in Section X of this report pursuant to House Rule XIII, clause 3(c)(3).

H.R. 3585 does not contain new budget authority, credit authority, or changes in revenues or tax expenditures. H.R. 3585 does authorize additional discretionary spending, as described in the Congressional Budget Office report on the bill, which is contained in Section X of this report.

X. Congressional Budget Office Cost Estimate

H.R. 3585—Solar Technology Roadmap Act

Summary: H.R. 3585 would authorize appropriations totaling $2.25 billion over the 2011–2015 period for the Department of Energy (DOE) to support various programs related to solar energy technology. The bill also would require DOE to assess the performance of existing solar power facilities in the United States. Finally, the bill would repeal certain laws related to solar energy research and development.

Based on information from DOE and assuming appropriation of the authorized and necessary amounts, CBO estimates that implementing the legislation would cost about $1.4 billion over the 2011–2014 period and about $840 million after 2014. Enacting the legislation would not affect direct spending or revenues.

H.R. 3585 contains no intergovernmental or private-sector mandates as defined in the Unfunded Mandates Reform Act (UMRA) and would impose no costs on state, local, or tribal governments.

Estimated cost to the federal government: The estimated budgetary impact of H.R. 3585 is shown in the following table. The costs of this legislation fall within budget function 250 (general science, space, and technology).

	By fiscal year, in millions of dollars—					
	2010	2011	2012	2013	2014	2010–2014
CHANGES IN SPENDING SUBJECT TO APPROPRIATION						
New Research, Development, and Demonstration Programs:						
Authorization Level	0	350	400	428	478	1,656
Estimated Outlays	0	193	325	408	451	1,377
Authorization of Existing Programs:						
Authorization Level	0	0	0	22	22	44
Estimated Outlays	0	0	0	12	19	31
Solar Facility Assessment:						
Estimated Authorization Level	1	0	0	0	0	1
Estimated Outlays	1	*	0	0	0	1
Total Changes:						
Estimated Authorization Level	1	350	400	450	500	1,701
Estimated Outlays	1	193	325	420	470	1,409

Note: * = less than $500,000.

Basis of estimate: For this estimate, CBO assumes that H.R. 3585 will be enacted near the start of fiscal year 2010 and that the authorized and necessary amounts will be appropriated for each fiscal year. Estimated outlays are based on historical spending patterns for similar DOE programs.

NEW RESEARCH, DEVELOPMENT, AND DEMONSTRATION PROGRAMS

H.R. 3585 would authorize the appropriation of about $2.18 billion over the 2011–2015 period for DOE programs to support the research, development, and demonstration of solar energy technologies. Of that amount, DOE would be required to spend at least $1 billion for projects recommended by the Solar Technology Roadmap Committee, which would be established under the bill to develop a long-term plan for the development of solar energy technologies. Assuming appropriation of the authorized amounts, CBO estimates that implementing those provisions would cost about $1.4 billion over the 2011–2014 period and about $800 million after 2014.

AUTHORIZATION OF EXISTING PROGRAMS

H.R. 3585 would authorize the appropriation of $12 million a year over the 2013–2015 period for a program aimed at developing lower-cost thermal energy storage technologies. The bill also would authorize the appropriation of $10 million a year over the 2013–2015 period for a workforce training program to support the expansion of the solar energy industry. Assuming appropriation of the authorized amounts, CBO estimates that implementing those provisions would cost $31 million over the 2013–2014 period and $35 million after 2014.

FACILITY ASSESSMENT

H.R. 3585 would require the Secretary of Energy to assess the performance of existing solar power facilities in the United States. Based on information from DOE regarding the cost of similar assessments, CBO estimates that conducting the facility assessment would cost about $1 million in 2010.

Intergovernmental and private-sector impact: H.R. 3585 contains no intergovernmental or private-sector mandates as defined in UMRA and would impose no costs on state, local, or tribal governments.

Estimate prepared by: Federal Costs: Jeff LaFave; Impact on State, Local, and Tribal Governments: Ryan Miller; Impact on the Private Sector: Amy Petz.

Estimate approved by: Theresa Gullo, Deputy Assistant Director for Budget Analysis.

XI. Compliance With Public Law 104–4

H.R. 3585 contains no unfunded mandates.

XII. Committee Oversight Findings and Recommendations

The oversight findings and recommendations of the Committee on Science and Technology are reflected in the body of this report.

XIII. Statement on General Performance Goals and Objectives

Pursuant to clause (3)(c) of House rule XIII, the goal of H.R. 3585 is to authorize a comprehensive research, development, and demonstration program to advance solar energy technologies.

XIV. Constitutional Authority Statement

Article I, section 8 of the Constitution of the United States grants Congress the authority to enact H.R. 3585.

XV. Federal Advisory Committee Statement

H.R. 3585 does not establish nor authorize the establishment of an advisory committee, pursuant to 5 U.S.C. App.

XVI. Congressional Accountability Act

The Committee finds that H.R. 3585 does not relate to the terms and conditions of employment or access to public services or accommodations within the meaning of section 102(b)(3) of the Congressional Accountability Act (Public Law 104–1).

XVII. Earmark Identification

H.R. 3585 does not contain any congressional earmarks, limited tax benefits, or limited tariff benefits as defined in clause 9 of rule XXI.

XVIII. Statement on Preemption of State, Local, or Tribal Law

This bill is not intended to preempt any state, local, or tribal law.

XIX.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 and existing law in which no change is proposed is shown in roman):

SOLAR ENERGY RESEARCH, DEVELOPMENT, AND DEMONSTRATION ACT OF 1974

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, [That this Act may be cited as the "Solar Energy Research, Development, and Demonstration Act of 1974".

[DECLARATION OF FINDINGS AND POLICY

[SEC. 2. (a) The Congress hereby finds that—

[(1) the needs of a viable society depend on an ample supply of energy;

[(2) the current imbalance between domestic supply and demand for fuels and energy is likely to persist for some time;

[(3) dependence on nonrenewable energy resources cannot be continued indefinitely, particularly at current rates of consumption;

[(4) it is in the Nation's interest to expedite the long-term development of renewable and nonpolluting energy resources, such as solar energy;

[(5) the various solar energy technologies are today at widely differing stages of development, with some already near the

stage of commercial application and others still requiring basic research;

[(6) the early development and export of viable equipment utilizing solar energy, consistent with the established preeminence of the United States in the field of high technology products, can make a valuable contribution to our balance of trade;

[(7) the mass production and use of equipment utilizing solar energy will help to eliminate the dependence of the United States upon foreign energy sources and promote the national defense;

[(8) to date, the national effort in research, development, and demonstration activities relating to the utilization of solar energy has been extremely limited; therefore

[(9) the urgency of the Nation's critical energy shortages and the need to make clean and renewable energy alternatives commercially viable require that the Nation undertake an intensive research, development, and demonstration program with an estimated Federal investment which may reach or exceed $1,000,000,000.

[(b) The Congress declares that it is the policy of the Federal Government to—

[(1) pursue a vigorous and viable program of research and resource assessment of solar energy as a major source of energy for our national needs; and

[(2) provide for the development and demonstration of practicable means to employ solar energy on a commercial scale.

[DEFINITIONS

[SEC. 3. For the purposes of this Act—

[(1) the term "solar energy" means energy which has recently originated in the Sun, including direct and indirect solar radiation and intermediate solar energy forms such as wind, sea thermal gradients, products of photosynthetic processes, organic wastes, and others;

[(2) the term "byproducts" includes, with respect to any solar energy technology or process, any solar energy products (including energy forms) other than those associated with or constituting the primary product of such technology or process;

[(3) the term "insolation" means the rate at which solar energy is received at the surface of the Earth;

[(4) the term "Project" means the Solar Energy Coordination and Management Project; and

[(5) the term "Chairman" means the Chairman of the Project.

[SOLAR ENERGY COORDINATION AND MANAGEMENT PROJECT

[SEC. 4. (a) There is hereby established the Solar Energy Coordination and Management Project.

[(b)(1) The Project shall be composed of six members as follows:

[(A) an Assistant Director of the National Science Foundation;

[(B) an Assistant Secretary of Housing and Urban Development;

[(C) a member of the Federal Power Commission;

[(D) an Associate Administrator of the National Aeronautics and Space Administration;

[(E) the General Manager of the Atomic Energy Commission;

[(F) a member to be designated by the President.

[(2) The President shall designate one member of the Project to Serve as Chairman of the Project.

[(3) If the individual designated under paragraph (1) (F) is an officer or employee of the Federal Government, he shall receive no additional pay on account of his service as a member of the Project. If such individual is not an officer or employee of the Federal Government, he shall be entitled to receive the daily equivalent of the annual rate of basic pay in effect for level IV of the Executive Schedule (5 U.S.C. 5315) for each day (including traveltime) during which he is engaged in the actual performance of duties vested in the Project.

[(c) The Project shall have overall responsibility for the provision of effective management and coordination with respect to a national solar energy research, development, and demonstration program, including—.

[(1) the determination and evaluation of the resource base, including its temporal and geographic characteristics;

[(2) research and development on solar energy technologies; and

[(3) the demonstration of appropriate solar energy technologies.

[(d)(1) The Project shall carry out its responsibilities under this section in cooperation with the following Federal agencies:

[(A) the National Science Foundation, the responsibilities of which shall include research;

[(B) the National Aeronautics and Space Administration, the responsibilities of which shall include the provision of management capability and the development of technologies;

[(C) the Atomic Energy Commission, the responsibilities of which shall include the development of technologies;

[(D) the Department of Housing and Urban Development, the responsibilities of which shall include fostering the utilization of solar energy for the heating and cooling of buildings, pursuant to the Solar Heating and Cooling Demonstration Act of 1974 (P.L. 93–409; 88 Stat. 1069); and

[(E) the Federal Power Commission, the responsibilities of which shall include fostering the utilization of solar energy for the generation of electricity and for the production of synthetic fuels.

[(2) Upon request of the Chairman, the head of any such agency is authorized to detail or assign, on a reimbursable basis or otherwise, any of the personnel of such agency to the Project to assist it in carrying out its responsibilities under this Act.

[(e) The Project shall have exclusive authority with respect to the establishment or approval of programs or projects initiated under this Act, but the agency involved in any particular program or project shall be responsible for the operation and administration of such program or project.

[(f) The National Aeronautics and Space Administration is authorized to undertake and carry out those programs assigned to it by the Project.

[RESOURCE DETERMINATION AND ASSESSMENT

[SEC. 5. (a) The Chairman shall initiate a solar energy resource determination and assessment program with the objective of making a regional and national appraisal of all solar energy resources, including data on insolation, wind, sea thermal gradients, and potentials for photosynthetic conversion. The program shall emphasize identification of promising areas for commercial exploitation and development. The specific goals shall include—

[(1) the development of better methods for predicting the availability of all solar energy resources, over long time periods and by geographic location;

[(2) the development of advanced meteorological, oceanographic, and other instruments, methodology, and procedures necessary to measure the quality and quantity of all solar resources on periodic bases;

[(3) the development of activities, arrangements, and procedures for the collection, evaluation, and dissemination of information and data relating to solar energy resource assessment.

[(b) The Chairman, acting through the National Aeronautics and Space Administration, the National Oceanic and Atmospheric Administration, and other appropriate agencies, shall—

[(1) develop and carry out a general plan for inventorying all forms of solar energy resources associated with Federal lands and (where consistent with property rights) non-Federal lands;

[(2) conduct regional surveys based upon such general plan, using innovative meteorological, oceanographic, and space-related techniques, in sufficient numbers to lead to a national inventory of solar energy resources in the United States;

[(3) publish and make available maps, reports, and other documents developed from such surveys to encourage and facilitate the commercial development of solar energy resources; and

[(4) make such recommendations for legislation as may appear to be necessary to establish policies for solar resources involving Federal lands and waters, consistent with known inventories of various resource types, with the state of technologies for solar energy development, and with evaluation of the environmental impacts of such development.

[RESEARCH AND DEVELOPMENT

[SEC. 6. (a) The Chairman shall initiate a research and development program for the purpose of resolving the major technical problems inhibiting commercial utilization of solar energy in the United States.

[(b) In connection with or as a part of such program, the Chairman shall—

[(1) conduct, encourage, and promote scientific research and studies to develop effective and economical processes and equipment for the purpose of utilizing solar energy in an acceptable manner for beneficial uses;

[(2) carry out systems, economic, social, and environmental studies to provide a basis for research, development and demonstration planning and phasing; and

[(3) perform or cause to be performed technology assessments relevant to the utilization of solar energy.

[(c) The specific solar energy technologies to be addressed or dealt with in the program shall include—

[(1) direct solar heat as a source for industrial processes, including the utilization of low-level heat for process and other industrial purposes;

[(2) thermal energy conversion, and other methods, for the generation of electricity and the production of chemical fuels;

[(3) the conversion of cellulose and other organic materials (including wastes) to useful energy or fuels;

[(4) photovoltaic and other direct conversion processes;

[(5) sea thermal gradient conversion;

[(6) windpower conversion;

[(7) solar heating and cooling of housing and of commercial and public buildings; and

[(8) energy storage.

[DEMONSTRATION

[SEC. 7. (a) The Chairman is authorized to initiate a program to design and construct, in specific solar energy technologies (including, but, not limited to, those listed in section (6)(c), facilities or power-plants of sufficient size to demonstrate the technical and economic feasibility of utilizing the various forms of solar energy. The specific goals of such programs shall include—

[(1) production of electricity from a number of powerplants, on the order of one to ten megawatts each;

[(2) production of synthetic fuels in commercial quantities;

[(3) large-scale utilization of solar energy in the form of direct heat;

[(4) utilization of thermal and all other byproducts of the solar facilities;

[(5) design and development of hybrid systems involving the concomitant utilization of solar and other energy sources; and

[(6) the continuous operation of such plants and facilities for a period of time.

[(b) For each of the technologies for which a successful and appropriate development program is completed, the Chairman shall make a determination to proceed to demonstration based on criteria including, but not necessarily limited to, the following:

[(1) the technological feasibility of the project;

[(2) the costs and benefits of the project, as determined by an nomic assessment;

[(3) the immediate and the potential uses of the solar energy utilized in the project;

[(4) long-term national need for the technology;

[(5) environmental impact;

[(6) potential for technology transfer to other applications; and

[(7) the nature and extent of Federal participation, if any, in the project.

[(c) In carrying out his responsibilities under this section, the Chairman, acting through the appropriate Federal agencies, may provide for the establishment of one or more demonstration projects utilizing each form of solar energy, which shall include, as appropriate, the specific research, development, pilot plant construction and operation, demonstration plant construction and operation, and other facilities and activities which may be necessary to show commercial viability of the specific solar technology.

[(d) The Chairman, acting through the appropriate Federal agencies, is authorized to investigate and enter into agreements for the cooperative development of facilities to demonstrate solar technologies. The responsible Federal agency may consider—

[(1) cooperative agreements with non-Federal entities for construction of facilities and equipment to demonstrate solar energy technologies; and

[(2) cooperative agreements with other Federal agencies for the construction of facilities and equipment and operation of facilities to produce energy for direct Federal utilization.

[(e) The Chairman, acting through appropriate Federal agencies is authorized to construct and operate demonstration projects without entering into cooperative agreements with respect to such projects, if the Chairman finds that—

[(1) the nature of the resource, the geographical location, the scale and engineering design of the facilities, the techniques of production, or any other significant factor of the specific demonstration project offers opportunities to make important contributions to the general knowledge of solar resources, the techniques of its development, or public confidence in the technology; and

[(2) there is no opportunity for cooperative agreements with any non-Federal entity willing and able to cooperate in the demonstration project under subsection (d)(1), and there is no opportunity for cooperative agreements with other Federal agencies under subsection (d)(2).

[(f) If the estimate of the Federal investment with respect to construction and operation costs of any demonstration project proposed to be established under this section exceeds $20,000,000, no amount may be appropriated for such project except as specifically authorized by legislation hereafter enacted by the Congress.

[(g)(1) At the conclusion of any demonstration project established under this section, or as soon thereafter as may be practicable, the responsible Federal agencies shall, by sale, lease, or otherwise, dispose of all Federal property interests which they have acquired pursuant to this section in accordance with existing law and the terms of the cooperative agreements involved.

[(2) The agency involved shall, under appropriate agreements or other arrangements, provide for the disposition of electricity, synthetic fuels, and other byproducts of the project administered by such agency.

[SOLAR ENERGY TECHNOLOGY UTILIZATION

[SEC. 8. (a)(1) In carrying out his functions under this Act the Chairman, utilizing the capabilities of the National Science Foundation, the National Aeronautics and Space Administration, the Department of Commerce, the Atomic Energy Commission, and

other appropriate Federal agencies to the maximum extent possible, shall establish and operate a Solar Energy Information Data Bank (hereinafter in this subsection referred to as the "bank") for the purpose of collecting, reviewing, processing, and disseminating information and data in all of the solar energy technologies referred to in section 7(c) in a timely and accurate manner in support of the objectives of this Act.

[(2) Information and data compiled in the bank shall include—

[(A) technical information (including reports, journal articles, dissertations, monographs, and project descriptions) on solar energy research, development, and applications;

[(B) similar technical information on the design, construction, and maintenance of equipment utilizing solar energy;

[(C) general information on solar energy applications to be disseminated for popular consumption;

[(D) physical and chemical properties of materials required for solar energy activities and equipment; and

[(E) engineering performance data on equipment and devices utilizing solar energy.

[(3) In accordance with regulations prescribed under section 12, the Chairman shall provide retrieval and dissemination services with respect to the information described under paragraph (2) for—

[(A) Federal, State, and local government organizations that are active in the area of energy resources (and their contractors);

[(B) universities and colleges in their related research and consulting activities; and

[(C) the private sector upon request in appropriate cases.

[(4) In carrying out his functions under this subsection, the Chairtnan shall utilize, when feasible, the existing data base of scientific and technical information in Federal agencies, adding to such data base any information described in paragraph (2) which does not already reside in such base. He shall coordinate or merge this data bank with other Federal energy information data banks as necessary to assure efficient and effective operation.

[(b) In carrying out his functions under this Act the Chairman shall perform or cause to be performed studies and research on incentives to promote broader utilization and consumer acceptance of solar energy technologies.

[(c) The Chairman shall enter into such arrangements and take such other steps as may be necessary or appropriate to provide for the effective coordination of solar energy technology utilization with all other technology utilization programs within the Federal Government.

[SCIENTIFIC AND TECHNICAL EDUCATION

[SEC. 9. The Chairman, acting through the National Science Foundation, is authorized and directed to support programs of education in the sciences and engineering to provide the necessary trained personnel to perform the solar energy research, development, and demonstration activities required under this Act. Such support may include fellowships, traineeships, technical training

programs, technologist training programs, and summer institute programs.]

* * * * * * *

[INTERNATIONAL COOPERATION

[SEC. 11. (a) The Chairman, in furtherance of the objectives of this Act, is authorized to cooperate and participate jointly with other nations, especially those with agreements for scientific cooperation with the United States, in the following activities:

[(1) interinstitutional, bilateral, or multilateral research projects in the field of solar energy; and

[(2) agreements and programs which will facilitate the exchange of information and data relating to solar energy resource assessment and solar energy technologies.

[(b) The National Science Foundation is authorized to encourage, to the maximum extent practicable and consistent with the other objectives of this Act, international participation and cooperation in the development and maintenance of programs of education to carry out the policy set forth in section 9.

[REGULATIONS

[SEC. 12. The Chairman, in consultation with the heads of the Federal agencies having functions under this Act and with other appropriate officers and agencies, shall prescribe such regulations as may be necessary or appropriate to carry out this Act promptly and efficiently. Each such officer or agency, in consultation with the Chairman, may prescribe such regulations as may be necessary or appropriate to carry out his or its particular functions under this Act promptly and efficiently.

[ANNUAL REPORTS

[SEC. 13. A summary of all actions taken under the provisions of this Act and action planned for the ensuing year shall be included in the annual report required by section 657 of the Department of Energy Organization Act (42 U.S.C. 7267).

[INFORMATION TO CONGRESS

[SEC. 14. Notwithstanding any other provision of law, the Chairman (or the head of any agency which assumes the functions of the Project pursuant to section 16) shall keep the appropriate committees of the House of Representatives and the Senate fully and currently informed with respect to all activities under this Act.

[COMPREHENSIVE PROGRAM DEFINITION

[SEC. 15. (a) The Chairman is authorized and directed to prepare a comprehensive program definition of an integrated effort and commitment for effectively developing solar energy resources. The Chairman, in preparing such program definition, shall utilize and consult with the appropriate Federal agencies, State and local government agencies, and private organizations.

[(b) The Chairman shall transmit such comprehensive program definition to the President and to each House of the Congress. An interim report shall be transmitted not later than March 1, 1975.

The comprehensive program definition shall be transmitted as soon as possible thereafter, but in any case not later than June 30, 1975.

[TRANSFER OF FUNCTIONS

[SEC. 16. Within sixty days after the effective date of the law creating a permanent Federal organization or agency having jurisdiction over the energy research and development functions of the United States (or within sixty days after the date of the enactment of this Act if the effective date of such law occurs prior to the date of the enactment of this Act), all of the authorities of the Project and all of the research and development functions (and other functions except those related to scientific and technical education) vested in Federal agencies under this Act along with related records, documents, personnel, obligations, and other items, to the extent necessary or appropriate, shall, in accordance with regulations prescribed by the Office of Management and Budget, be transferred to and vested in such organization or agency.

[AUTHORIZATION OF APPROPRIATIONS

[SEC. 17. To carry out the provisions of this Act, there are authorized to be appropriated—

[(1) for the fiscal year ending June 30, 1976, $75,000,000;

[(2) for subsequent fiscal years, only such sums as the Congress hereafter may authorize by law;

[(3) such amounts as may be authorized for the construction of demonstrations pursuant to section 7(f) of this Act; and

[(4) to the National Science Foundation for the fiscal year ending June 30, 1975, not to exceed $2,000,000 to be made available for use in the preparation of the comprehensive program definition under section 15.]

SOLAR PHOTOVOLTAIC ENERGY RESEARCH, DEVELOPMENT, AND DEMONSTRATION ACT OF 1978

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, [That this Act may be cited as the "Solar Photovoltaic Energy Research, Development, and Demonstration Act of 1978".

FINDINGS AND POLICY

[SEC. 2.(a) The Congress hereby finds that—

[(1) the United States of America is faced with a finite and diminishing resource base of native fossil fuels, and as a consequence must develop as quickly as possible a diversified, pluralistic national energy capability and posture;

[(2) the current imbalance between supply and demand for fuels and energy in the United States is likely to grow for many years;

[(3) the early demonstration of the feasibility of using solar photovoltaic energy systems for the generation of electricity could help to relieve the demand on existing fuel and energy supplies;

[(4) the national security and economic well-being of the United States is endangered by its dependence on imported en-

ergy supplies which are subject to resource limitations, artificial pricing mechanisms which do not accurately reflect supply and demand relationships, and supply interruptions;

[(5) the early development and widespread utilization of photovoltaic energy systems could significantly expand the domestic energy resource base of the United States, thereby lessening its dependence on foreign supplies;

[(6) the establishment of sizable markets for photovoltaic energy systems will justify private investment in plant and equipment necessary to realize the economies of scale, and will result in significant reductions in the unit costs of these systems;

[(7) the use of solar photovoltaic energy systems for certain limited applications has already proved feasible;

[(8) there appear to be no insoluble technical obstacles to the widespread commercial use of solar photovoltaic energy technologies;

[(9) an aggressive research and development program should solve existing technical problems of solar photovoltaic systems; and, supported by an assured and growing market for photovoltaic systems during the next decade, should maximize the future contribution of solar photovoltaic energy to this Nation's future energy production;

[(10) it is the proper and appropriate role of the Federal Government to undertake research, development, and demonstration programs in solar photovoltaic energy technologies and to supplement and assist private industry and other entities and thereby the general public, so as to hasten the general commercial use of such technologies;

[(11) the high cost of imported energy sources impairs the economic growth of many nations which lack sizable domestic energy supplies or are unable to develop these resources;

[(12) photovoltaic energy systems are economically competitive with conventional energy resources for a wide variety of applications in many foreign nations at the present time, and will find additional applications with continued cost reductions;

[(13) the early development and export of solar photovoltaic energy systems, consistent with the established preeminence of the United States in the field of high technology products, can make a valuable contribution to the well-being of the people of other nations and to this Nation's balance of trade;

[(14) the widespread use of solar photovoltaic energy systems to supplement and replace conventional methods for the generation of electricity would have a beneficial effect upon the environment;

[(15) to increase the potential application of solar photovoltaic energy systems in remote locations, and to minimize the need for backup systems depending on fossil fuel, programs leading to the development of inexpensive and reliable systems for the storage of electricity should be pursued as part of any solar photovoltaic energy research, development, and demonstration program;

[(16) evaluation of the performance and reliability of solar photovoltaic energy technologies can be expedited by testing of prototypes under carefully controlled conditions;

[(17) commercial application of solar photovoltaic energy technologies can be expedited by early commercial demonstration under practical conditions;

[(18) photovoltaic energy systems are currently adaptable on a life cycle, cost-justified basis for certain of the energy needs of the Federal Government, and will find additional applications as continued refinements improve performance and reduce unit costs;

[(19) the Federal Government can stimulate innovation and economic efficiency in the production of photovoltaic energy systems through the development and implementation of policies to promote diversity and maximum competition between firms engaged in the research, manufacture, installation, and/or maintenance of these systems;

[(20) innovation and creativity in the development of solar photovoltaic energy components and systems can be fostered through encouraging direct contact between the manufacturers of such systems and the architects, engineers, developers, contractors, and other persons interested in utilizing such systems; and

[(21) it is contemplated that the ten-year program established by this Act will require the expenditure of $1,500,000,000 by the Federal Government.

[(b) It is therefore declared to be the policy of the United States and the purpose of this Act to establish during the next decade an aggressive research, development, and demonstration program involving solar photovoltaic energy systems and in the long term, to have as an objective the production of electricity from photovoltaic systems cost competitive with utility-generated electricity from conventional sources. Further, it is declared to be the policy of the United States and the purpose of this Act that the objectives of this research, development, and demonstration program are—

[(1) to double the production of solar photovoltaic energy systems each year during the decade starting with fiscal year 1979, measured by the peak generating capacity of the systems produced, so as to reach a total annual United States production of solar photovoltaic energy systems of approximately two million peak kilowatts, and a total cumulative production of such systems of approximately four million peak kilowatts by fiscal year 1988;

[(2) to reduce the average cost of installed solar photovoltaic energy systems to $1 per peak watt by fiscal year 1988; and

[(3) to stimulate the purchase by private buyers of at least 90 per centum of all solar photovoltaic energy systems produced in the United States during fiscal year 1988.

[DEFINITIONS

[SEC. 3. For purposes of this Act—

[(1) a "solar photovoltaic energy system" is a system of components which generates electricity from incident sunlight by means of the photovoltaic effect, and which shall include all components, including energy storage devices where appropriate, necessary to provide electricity for individual, industrial, agricultural, or governmental use;

[(2) the term "solar photovoltaic energy system" may be used interchangeably with the term "photovoltaic system";

[(3) a "hybrid solar photovoltaic energy system" is a system of components that generates electricity from incident sunlight by means of the photovoltaic effect and, in conjunction with electronic and, if appropriate, optical, thermal and storage devices, provides electricity, as well as heat and/or light for individual, commercial, industrial, agricultural, or governmental use:

[(4) "photovoltaic effect" refers to the physical phenomenon exhibited under certain circumstances by some materials in which a portion of the light energy striking the material is directly converted to electrical energy;

[(5) "facility" means any building, agricultural, commercial or industrial complex or other device constructively employing photovoltaic systems; and

[(6) "Secretary" means the Secretary of Energy.

[RESEARCH, DEVELOPMENT, AND DEMONSTRATION OF SOLAR PHOTOVOLTAIC ENERGY SYSTEMS

[SEC. 4. The Secretary is directed to establish immediately and carry forth such research, development, and demonstration programs as may be necessary to meet the objectives of this Act as set forth in section 2(b), and as a part of any such program shall—

[(a) conduct, and promote the coordination and acceleration of, research, development, and demonstrations relating to solar photovoltaic energy systems and components thereof, and

[(b) conduct, and promote the coordination and acceleration of, research, development, and demonstrations for systems and components to be used in applications that are dependent for their energy on solar photovoltaic energy systems.

[SEC. 5.(a) In carrying out the provisions of section (4), the Secretary is authorized—

[(1) to establish procedures whereby any public or private entity wishing to install solar photovoltaic components and systems in any new or existing facility may apply for Federal assistance in purchasing and installing, in such facility, photovoltaic components or systems;

[(2) to select, as soon as he deems it feasible, a number of the applicants under paragraph (1) and enter into agreements with them for the design, purchase, fabrication, testing, installation, and demonstration of photovoltaic components and systems. Such selection shall be based on the need to obtain scientific, technological, and economic information from a variety of such systems under a variety of circumstances and conditions; and

[(3) to arrange, as part of any agreement entered into under paragraph (2), to provide up to 75 per centum of the purchase and installation costs of photovoltaic components or systems, taking into account relevant considerations involving the relative stage of consumer and industry interest and development at the time of the financial assistance action. Such arrangements shall be contingent upon terms and conditions prescribed by the Secretary, including an express agreement that the entity with whom the agreement is entered into shall, in

such manner and form and on such terms and conditions as the Secretary may prescribe, observe and monitor (or permit the Secretary or his agents to observe and monitor) the performance and operation of such system for a period of five years, and that such entity (including any subsequent owner of the property) shall regularly furnish the Secretary with such reports thereon as the agreement may require.

[(b) The Secretary shall, as he deems appropriate, undertake any projects or activities (including demonstration projects) to further the attainment of the objectives of this section.

[SEC. 6. (a) The Secretary is authorized to select on the basis of open competitions—

[(1) a number of readily available photovoltaic components and systems;

[(2) a number of design concepts for various types of applications which demonstrate adaptability to the utilization of photovoltaic components and systems; and

[(3) a number of designs for applications selected under paragraph (2), so that each design includes specific provisions for the utilization of solar photovoltaic components and systems selected under paragraph (1).

[(b) The Secretary, in accordance with the applicable provisions of sections 7, 8, and 9 of the Federal Nonnuclear Energy Research and Development Act of 1974 (42 U.S.C. 5901 et seq.) and with such program guidelines as the Secretary may establish, shall—

[(1) enter into such contracts and grants as may be necessary or appropriate for the development for commercial production and utilization of photovoltaic components and systems, including any further planning and design which may be required to conform with the specifications set forth in any applicable criteria;

[(2) select, as being compatible with the design concepts chosen under subsection (a) (2) of this section, a reasonable number of photovoltaic components and systems; and

[(3) enter into contracts with a number of persons or firms for the procurement of photovoltaic components and systems, including adequate numbers of spare and replacement parts for such systems.

[(c) The Secretary is authorized to award contracts for the design integration between the application concepts and the photovoltaic systems procured by the Secretary under subsection (b) (3), and for the demonstration of prototype solar photovoltaic systems, and, when appropriate, for the utilization of such systems in existing facilities. Title to and ownership of the facilities so constructed and of photovoltaic systems installed hereunder may be conveyed to purchasers of such facilities under terms and conditions prescribed by the Secretary, including an express agreement that ally such purchaser shall, in such manner and form and on such terms and conditions as the Secretary may prescribe, observe and monitor (or permit the Secretary to observe and monitor) the performance and operation of such systems for a period of five years, and that such purchaser (including any subsequent owner) shall regularly furnish the Secretary with such reports thereon as the agreement may require.

[(d) The Secretary, in consultation with the Administrator of General Services or the Secretary of Defense or both (as may be appropriate) shall enter into arrangements with appropriate Federal agencies concurrently with the conduct of the programs under this section and section 7 of this Act, to carry out such projects and activities (including demonstration projects), with respect to Federal buildings and facilities, as may be appropriate for the demonstration of photovoltaic systems suitable and effective for use in such applications.

[(e) The Secretary shall, as he deems appropriate, undertake any projects or activities (including demonstration projects) to further the attainment of the objectives of this section.

[TEST PROCEDURES AND PERFORMANCE CRITERIA

[SEC. 7. (a) The Secretary shall conduct a testing program for photovoltaic systems to assist in the development and demonstration of prototype photovoltaic systems, including collectors, controls, power conditioning, and energy storage systems.

[(b) Data obtained from the testing program under subsection (a) shall be evaluated and used in establishing performance criteria. These performance criteria shall be used in the demonstration program described in sections 4, 5, and 6 of this Act.

[(c) The Secretary shall determine, prescribe, and publish in the Federal Register, at a time which he determines to be feasible and justified—

[(1) performance criteria for photovoltaic components and systems to be used in appropriate applications, and procedures whereby manufacturers of photovoltaic components and systems shall have their products tested in order to provide certification that such products conform to the performance criteria established under this paragraph; and

[(2) revised performance criteria for photovoltaic components and systems to be used in appropriate applications, and procedures whereby manufacturers of photovoltaic components and systems shall have their products tested in order to provide certification that such products conform to the performance criteria established under this paragraph. Such criteria may be annually revised by the Secretary, as he deems appropriate.

[(d) Any photovoltaic component or system procured or installed by the Federal Government or procured or installed with Federal assistance under section (5) or section (6) shall meet appropriate performance criteria prescribed under this section, if such performance criteria have been prescribed.

[COORDINATION MONITORING, AND LIAISON

[SEC. 8. (a) The Secretary, in coordination with such Government agencies as may be appropriate, shall—

[(1) monitor the performance and operation of photovoltaic systems installed under this Act;

[(2) collect and evaluate data and information on the performance and operation of photovoltaic systems installed under this Act; and

[(3) from time to time carry out such studies and investigations and take such other actions, including the submission of special reports to the Congress when appropriate, as may be

necessary to assure that the programs for which the Secretary is responsible under this Act effectively carry out the policy of this Act.

[(b) In the development of the performance criteria and test procedures required under section 7 of this Act, the Secretary shall work closely with the appropriate scientific, technical, and professional societies and industry representatives in order to assure the best possible use of available expertise in this area.

[(c) The Secretary shall also maintain continuing liaison with related industries and interests, and with the scientific and technical community, during and after the period of the programs carried out under this Act, in order to assure that the projected benefits of such programs are and will continue to be realized.

[SOLAR PHOTOVOLTAIC ENERGY ADVISORY COMMITTEE

[SEC. 9. (a) There is hereby established a Solar Photovoltaic Energy Advisory Committee, which shall study and advise the Secretary on—

[(1) the scope and pace of research and development with respect to solar photovoltaic energy systems;

[(2) the need for and timing of solar photovoltaic energy systems demonstration projects;

[(3) the need for change in any research, development, or demonstration program established under this Act; and

[(4) the economic, technological, and environmental consequences of the use of solar photovoltaic energy systems.

[(b) The Committee shall be composed of thirteen members, including eleven members appointed by the Secretary from industrial organizations, academic institutions, professional societies or institutions, and other sources as he sees fit, and two members of the public appointed by the President. The Chairman of the Committee shall be elected from among the members thereof.

[(c) The heads of the departments, agencies, and instrumentalities of the executive branch of the Federal Government shall cooperate with the Committee in carrying out the requirements of this section, and shall furnish to the Committee such information as the Committee deems necessary to carry out this section.

[(d) Section 624 of the Department of Energy Organization shall be applicable to the Committee, except as inconsistent with this section.

[DISSEMINATION OF INFORMATION AND OTHER ACTIVITIES TO PROMOTE PRACTICAL USE OF SOLAR PHOTOVOLTAIC TECHNOLOGIES

[SEC. 10 (a) The Secretary shall take all possible steps to assure that full and complete information with respect to the demonstrations and other activities conducted under this Act is made available to Federal, State, and local authorities, relevant segments of the economy, the scientific and technical community, and the public at large, both during and after the close of the programs under this Act, with the objective of promoting and facilitating to the maximum extent feasible the early and widespread practical use of photovoltaic energy throughout the United States. Any trade secret or other proprietary information shall be exempted from such mandatory disclosure, as otherwise specified in law applicable to research, development and demonstration programs of the Department of

Energy, including, but not limited to, section 17 of the Federal Non-Nuclear Energy Research and Development Act of 1974, Public Law 93–577, as amended.

[(b) The Secretary shall—

[(1) study the effect of the widespread utilization of photovoltaic systems on the existing electric utility system at varying levels of photovoltaic contribution to the system;

[(2) study and investigate the effect of utility rate structures, building codes, zoning ordinances, and other laws, codes, ordinances, and practices upon the practical use of photovoltaic systems;

[(3) determine the extent to which such laws, codes, ordinances, arid practices should be changed to permit or facilitate such use and the methods by which any such changes may best be accomplished; and

[(4) determine the necessity of a program of incentives to accelerate the commercial application of photovoltaic technologies.

[(c) The Secretary is authorized and directed, within one year of the date of enactment of this Act, to make recommendations to the President and to the Congress for Federal policies relating to barriers to the early and widespread utilization of photovoltaic systems in order to realize the goals set forth in section 2. These recommendations shall include but not be limited to—

[(1) the potential for integration of electricity derived from photovoltaic energy systems into the existing national grid system, including the potential of photovoltaic-generated electricity to meet the peak-load energy needs of electric utilities, load management and reliability implications of the utilization of photovoltaic electricity by utilities, the implications of utility ownership of photovoltaic components leased to others primarily for decentralized applications, the impacts of utility use of electricity derived from photovoltaic energy systems on utility rate structures, and the potential for reducing or obviating the need for energy storage components for photovoltaic energy systems through utility interface;

[(2) the extent of competition between firms currently engaged in the fabrication and installation of photovoltaics components and systems as it affects the character and growth potential of the American photovoltaics industry, and the likelihood that small photovoltaic firms will have reasonable opportunities to compete and participate in the various programs authorized by this Act;

[(3) the need to identify legal alternatives to ensure access to direct sunlight for photovoltaic energy systems, the appropriate methods of encouraging the adoption of such alternatives, and the implications of widespread utilization of photovoltaic energy systems for land use and urban development;

[(4) the availability of private capital at reasonable interest rates for individuals, businesses and others desiring to establish commercial enterprises to manufacture, market, install, and/or, maintain photovoltaic components and systems, or purchase and install such systems for private, industrial, agricultural, commercial or other uses;

[(5) the need for industry-wide warranty and reliability standards for photovoltaic energy components and systems for private sector applications, and, if appropriate, the mechanisms for establishing such standards; and

[(6) the attainability of the goals specified in subsection 2(b), and any modification of such goals which the Secretary proposes for consideration by Congress, with supporting analyses.

[(d) In carrying out his functions under this section, the Secretary shall consult with the appropriate government agencies, industry representatives, and members of the scientific and technical community having expertise and interest in this area. The Secretary also shall ensure that any study or report prepared pursuant to this section is fully coordinated with and reflective of any analyses or reports prepared pursuant to the requirements in section 208 of the Department of Energy Act of 1978—Civilian Applications, Public Law 95–238, and in the President's Solar Energy Domestic Policy Review. The Secretary, as appropriate, may merge any continuing or on-going studies under section 208 or the Domestic Policy Review with those required by this section or avoid any unnecessary duplication of effort or funding. The separate report requirements of section 208 and this section, however, shall remain in force.

[INTERNATIONAL PARTICIPATION AND COOPERATION

[SEC. 11. (a) Within one year after the date of the enactment of this Act, the Secretary, in consultation with the Secretary of State, the Administrator of the Agency for International Development, the Director of the Export/Import Bank and other appropriate Federal officials, shall submit to the House Committee on Science and Technology and the Senate Committee on Energy and Natural Resources a plan for demonstrating applications of solar photovoltaic energy systems and facilitating their widespread use in other nations, especially those with agreements for scientific cooperation with the United States.

[(b) The Secretary is authorized to encourage, to the maximum ent practicable, international participation and cooperation in the development and maintenance of programs established under this plan. The Secretary, in consultation and cooperation with the Federal officials specified in subsection (a), shall insure to the maximum extent possible that the plan submitted under subsection (a) and any other international activities under this section are consistent with and reflective of any similar activities or requirements under any other Federal statute, specifically including any of the several programs under other agencies and Departments involving United States international cooperation and assistance in nonnuclear energy technology, and will not duplicate activities under such programs. The plan required in subsection (a) shall specifically identify all such programs and statutes and describe how the activities under this section will be consistent with such programs, will be coordinated with them, and will avoid duplication of activities under such programs.

[ENCOURAGEMENT AND PROTECTION OF SMALL BUSINESS

[SEC. 12. In carrying out his functions under this Act, the Secretary shall take steps to assure that small-business concerns will

have realis tic and adequate opportunities to participate in the programs under this Act to the maximum extent practicable, and the Secretary is directed to set aside at least 10 per centum of the funds authorized and appropriated for the participation of small business concerns.

[PRIORITIES

[SEC. 13. The Secretary shall set priorities, as far as possible consistent with the intent and operation of this Act, in accordance with the following criteria:

[(1) The applications utilizing photovoltaic systems which will be part of the research, development, and demonstration program and testing and demonstration programs referred to in sections 4, 5, 6, and 7 shall be located in a sufficient number of different geographic areas in the United States to assure a realistic and effective demonstration of the use of photovoltaic systems and of the applications themselves, in both rural and urban locations and under climatic conditions which vary as much as possible.

[(2) The projected costs of commercial production and maintenance of the photovoltaic systems utilized in the testing and demonstration programs established under this Act should be taken into account.

[(3) Encouragement should be given in the conduct of programs under this Act to those projects in which funds are appropriated by any State or political subdivision thereof for the purpose of sharing costs with the Federal Government for the purchase and installation of photovoltaic components and systems.

[SEC. 14. Nothing in this Act shall be construed to negate, duplicate, or otherwise affect the provisions of title V (Federal Initiatives), part 4 (Federal Photovoltaic Utilization), National Energy Conservation Policy Act, H.R. 5037, 95th Congress, if and when that Act becomes enacted by the Ninety-fifth Congress, and such part 4 shall be exempted fully from the provisions of this Act and any regulations, guidelines, or criteria pursuant thereto.

[AUTHORIZATION OF APPROPRIATIONS

[SEC. 15. There is hereby authorized to be appropriated to the Secretary, for the fiscal year ending September 30, 1979, $125,000,000, inclusive of any funds otherwise authorized for photovoltaic programs, (1) to carry out the functions vested in the Secretary by this Act, (2) to carry out the functions in fiscal year 1979, vested in the Secretary by part 4 of title V of H.R. 5037, 95th Congress, if enacted by the 95th Congress, and (3) for transfer to such other agencies of the Federal Government as may be required to enable them to carry out their respective functions under this Act. Funds appropriated pursuant to this section shall remain available until expended: *Provided*, That any contract or agreement entered into pursuant to this Act shall be effective only to such extent or in such amounts as are provided in advance in appropriation Acts. Authorizations of appropriations for fiscal years after fiscal year 1979 shall be contained in the annual authorization for the Department of Energy, except for those funds authorized for fiscal years 1980 and 1981 contained in part 4 of title V of H.R. 5037, Ninety-fifth Congress, if enacted by the Ninety-fifth Congress.]

SECTION 4 OF THE RENEWABLE ENERGY EFFICIENCY TECHNOLOGY COMPETITIVENESS ACT OF 1989

SEC. 4. NATIONAL GOALS AND MULTI-YEAR FUNDING FOR FEDERAL WIND, PHOTOVOLTAICS, AND SOLAR THERMAL PROGRAMS.

(a) NATIONAL GOALS.—The following are declared to be the national goals for the wind, photovoltaics, and solar thermal energy programs being carried out by the Secretary:

(1) * * *

[(2) PHOTOVOLTAICS.—(A) In general, the goals of the Photovoltaic Energy Systems Program shall include improving the reliability and conversion efficiencies of and lowering the costs of photovoltaic conversion. Research efforts shall emphasize advancements in the performance, stability, and durability of photovoltaic materials.

[(B) Specific goals of the Photovoltaic Energy Systems Program shall be to—

[(i) improve operational reliability of photovoltaic modules to 30 years by 1995;

[(ii) increase photovoltaic conversion efficiencies by 20 percent by 1995;

[(iii) decrease new photovoltaic module direct manufacturing costs to $800 per kilowatt by 1995; and

[(iv) increase cost efficiency of photovoltaic power production to 10 cents per kilowatt hour by 1995.

[(3) SOLAR THERMAL.—(A) In general, the goal of the Solar Thermal Energy Systems Program shall be to advance research and development to a point where solar thermal technology is cost-competitive with conventional energy sources, and to promote the integration of this technology into the production of industrial process heat and the conventional utility network. Research and development shall emphasize development of a thermal storage technology to provide capacity for shifting power to periods of demand when full insolation is not available; improvement in receivers, energy conversion devices, and innovative concentrators using stretch membranes, lenses, and other materials; and exploration of advanced manufacturing techniques.

[(B) Specific goals of the Solar Thermal Energy Systems Program shall be to—

[(i) reduce solar thermal costs for industrial process heat to $9.00 per million Btu by 1995; and

[(ii) reduce average solar thermal costs for electricity to 4 to 5 cents per kilowatt hour by 1995.]

* * * * * * *

XX. COMMITTEE RECOMMENDATIONS

On October 7, 2009, the Committee on Science and Technology by voice vote favorably reported the bill, H.R. 3585, as amended, to the House with the recommendation that the bill, as amended, do pass.

XXI: PROCEEDINGS OF THE MARKUP BY THE SUBCOMMITTEE ON ENERGY AND ENVIRONMENT ON H.R. 3585, SOLAR TECHNOLOGY ROADMAP ACT

WEDNESDAY, SEPTEMBER 30, 2009

HOUSE OF REPRESENTATIVES,
SUBCOMMITTEE ON ENERGY AND ENVIRONMENT,
COMMITTEE ON SCIENCE,
Washington, DC.

The Subcommittee met, pursuant to call, at 10:00 a.m., in Room 2318 of the Rayburn House Office Building, Hon. Brian Baird [Chairman of the Subcommittee] presiding.

Chairman BAIRD. Good morning. The Subcommittee will now come to order.

Pursuant to notice, the Subcommittee on Energy and Environment meets to consider the following measures: H.R. 3650, the *Harmful Algal Blooms and Hypoxia Research and Control Amendments Act of 2009;* H.R. 3585, the *Solar Technology Roadmap Act;* and H.R. 3598, the *Energy and Water Research Integration Act.* Today we will consider these there bills that cover a wide range of topics in this subcommittee's purview.

First, the Subcommittee will consider my bill, H.R. 3650, the *Harmful Algal Blooms and Hypoxia Research and Control Amendments Act of 2009.* As we heard in this subcommittee two weeks ago, rapid overproduction of algae can have devastating effects on aquatic plant and animal life and human health. Unfortunately, despite years of research, the frequency and duration of the harmful algal blooms and hypoxia are on the rise, and affecting more of our coastlines and inland waters. This bill directs the National Oceanic and Atmospheric Administration to implement research strategies and plans to better understand and respond to these blooms and hypoxic events. I look forward to discussing the bill more when we call it up for consideration.

Our third bill will be H.R. 3585. We are changing the order slightly in order for Chairman Gordon to make an Energy and Commerce markup, so our third bill will be H.R. 3585, the *Solar Technology Roadmap Act,* authored by the Space and Aeronautics Subcommittee Chair, Ms. Gabrielle Giffords. This bill instructs the Department of Energy to create a comprehensive and updatable roadmap for solar research, development and demonstration activities with strong private and public input. This roadmap will be critically important to using our limited research dollars as effec-

tively as possible in harnessing the truly immense solar resources we have in the U.S.

Then our second bill will be H.R. 3598, the *Energy and Water Research Integration Act,* authored by the Full Committee Chairman, Mr. Bart Gordon. A little over a year ago, the Chairman began a comprehensive review of our federal research and technology development efforts to improve utilization of our precious water resources. The Committee has since held five hearings and passed out of the House three bills pertaining to this important topic. We now look forward to hearing from Chairman Gordon on this next installment, which addresses the critical linkage between our nation's energy and water resources and directs the Department of Energy to better integrate water into existing federal efforts in this field.

The three bills we have before us today target several important research needs. I thank you all for your attendance and participation this morning, and I look forward to a productive markup.

I recognize Mr. Inglis to present his opening remarks.

[The prepared statement of Chairman Baird follows:]

PREPARED STATEMENT OF CHAIRMAN BRIAN BAIRD

I welcome everyone to this morning's Energy and Environment Subcommittee markup.

Today we will consider three bills that cover a wide range of topics in this subcommittee's purview.

First, the Subcommittee will consider my bill, H.R. 3650, the *Harmful Algal Blooms and Hypoxia Research and Control Amendments Act of 2009.* As we heard in this subcommittee two weeks ago, rapid overproduction of algae can have devastating effects on aquatic plant and animal life and human health.

Unfortunately, despite years of research, the frequency and duration of the harmful algal blooms and hypoxia are on the rise, and affecting more of our coastlines and inland waters. This bill directs the National Oceanic and Atmospheric Administration to implement research strategies and plans to better understand and respond to these blooms and hypoxic events. I look forward to discussing the bill more when we bring it up for consideration.

Next, we will consider H.R. 3585, the *Solar Technology Roadmap Act,* authored by the Space and Aeronautics Subcommittee Chair, Ms. Gabrielle Giffords. This bill instructs the Department of Energy to create a comprehensive, updatable roadmap for solar research, development, and demonstration activities with strong private and public input.

This roadmap will be critically important to using our, limited research dollars as effectively as possible in harnessing the truly immense solar resources we have in the U.S.

Finally, we will take up H.R. 3598, the *Energy and Water Research Integration Act,* authored by the Full Committee Chairman, Mr. Bart Gordon. In the last Congress the Chairman announced his intention to undertake a comprehensive review of our federal research and technology development efforts to improve utilization of our precious water resources. We have since held five hearings and passed out of the House three bills pertaining to this important topic.

We now look forward to hearing from Chairman Gordon on this next installment which addresses the critical linkage between our nation's energy and water resources, and directs the Department of Energy to better integrate water into existing federal efforts in this field.

The three bills we have before us today target several important research needs. I thank you all for your attendance and participation this morning, and I look forward to a productive markup.

Mr. INGLIS. Thank you, Mr. Chairman. Today we address three pieces of legislation that aim to improve the health of our environment, our investment in solar energy and impact of energy use and development on water resources.

The first bill we will look at is the *Harmful Algal Bloom and Hypoxia Research and Control Amendments Act of 2009.* It will advance efforts at the federal level to reduce the negative impact that algal blooms have on the environment. Every summer we hear stories about the impact of runaway algae growth on local air quality, animal deaths and environmental quality. Not only do these blooms impact recreation, they burden marine, commerce and human health. This legislation will promote a better understanding of algal blooms and will help us effectively prevent and respond to blooms and hypoxia.

Second, we will discuss the *Solar Technology Roadmap Act.* This bill aims to increase the strength of our domestic solar technology industry through a coordinated research and development program and public-private partnerships. It also requires industry, academia and government researchers to develop a long-term roadmap that will advance our clean energy alternatives. I hope we can ensure the roadmap is not focused on technology options we are already aware of but also emphasizes cutting-edge advancements that will define the future of solar power.

Finally, we turn to the *Energy and Water Research Integration Act,* which directs the Department of Energy to take into consideration energy-related water issues in research, development and demonstration projects. While I agree with the intent of the bill, I am concerned that this only reframes existing DOE priorities and ignores the large role that water resource information should play. I am looking forward to working together to improve the bill.

Thank you again, Mr. Chairman, and I look forward to addressing this legislation.

Chairman BAIRD. Thank you, Mr. Inglis. Members may place statements for the record at this point.

We will now—I appreciate the patience of the gentlelady from Arizona. We will now consider H.R. 3585, the *Solar Technology Roadmap Act.* I recognize Ms. Giffords to speak about her bill.

Ms. GIFFORDS. Great. Thank you, Mr. Chairman. Thank you, Ranking Member Inglis.

The United States has some of the best solar resources of any industrialized country in the world. Not just the State of Arizona but every single one of our states has incredible solar potential. This resource is just waiting to be tapped. Supporting an American solar industry is a smart decision for many reasons. The solar industry is already a source of thousands of good jobs and has the potential to create thousands more. Solar power strengthens our national security by reducing our demand for foreign energy and distributed solar increases the security of our electricity grid and decreases the cost and transmission. Finally, solar can help meet our increasing energy demands with a clean, renewable energy resource.

The United States is currently a leader in solar technology development but other countries are devoting much more effort and attention to this field. Consequently, United States competitiveness in this burgeoning industry is truly in jeopardy. There have been several recent articles in many newspapers, many reports that have highlighted the fast growth of the solar industry in China and other places, Europe, of course. Whether it is the IMEC in Belgium

or the Fraunhofer Institute in Germany, collaborative research in solar technology is gaining support abroad.

Back in July, this committee heard testimony outlining the history of thin film solar technologies that have created two of the most successful solar companies in the world, First Solar and Uni-Solar. These companies are technology leaders and the research that led to their technology was largely a result of research grants being given by the Department of Energy. We invented this technology but we are going to have to work a lot harder if we are going to retain our leadership, and this is the essence of this bill.

In the early 1980s, the global competitive landscape for semiconductors was similar to the landscape for solar technology today. By increasing communication between the diverse members of the supply chain, the United States semiconductor industry was able to develop standards and avoid duplication in research efforts. Through organized coordination efforts and an increased focus on developing manufacturing technologies, the United States gave rise to semiconductor giants like Intel and AMD. As a result of these coordinated R&D efforts, the United States continues to lead the world in semiconductor development.

Today, solar researchers in the United States are in a similar situation. To maintain a competitive advantage, they must come together to meet their common pre-competitive goals whether in simulation, developing new materials, energy storage, power and grid manufacturing, mounting or even weather forecasting. This bill would require the Department of Energy to learn from the roadmap laid out in the 1980s in the semiconductor industry to engage diverse stakeholders now in the solar community and work across programs to create a comprehensive plan, a roadmap to guide funding for the research needed to make the United States the global center for innovation.

This bill aims to make DOE responsive to the solar industry and to encourage increased collaboration and communication across technologies. To Mr. Inglis's question, this bill is agnostic toward any specific type of technology. What this bill would do would connect research from early stage all the way through deployment, supporting research in areas that benefit the solar industry as a whole and shepherding new technologies through the valley of death. This will help the United States retain its position as a leader in solar technology.

Mr. Chairman, Ranking Member Inglis, we have an opportunity to be the leading developer and exporter of clean solar technologies in the coming years and decades. This technology is fantastic not just for Arizona but for all of our states. I want us to be able to look back 10 years from now and know that here in this subcommittee we started the roadmap plan for solar that will truly lead to the advancement of this incredible technology, and I urge my colleagues to support this bill.

[The prepared statement of Ms. Giffords follows:]

PREPARED STATEMENT OF REPRESENTATIVE GABRIELLE GIFFORDS

Thank you Mr. Chairman.

The United States has some of the best solar resources of any industrialized country in the world. Our solar resource is a tremendous opportunity that is just waiting to be tapped.

Supporting an American Solar industry is a smart decision for many reasons. The solar industry is already a source of thousands of good jobs and has the potential to create thousands more. Solar power strengthens our national security by reducing our demand for foreign energy, and distributed solar increases the security of our electricity grid and decreases the cost transmission. Finally, solar can help us meet our increasing energy demands with a clean, renewable resource.

The U.S. is currently a leader in solar technology development; but other countries are devoting much more effort and attention to this field. Consequently, U.S. competitiveness in this burgeoning industry is in jeopardy.

Several recent articles in the *New York Times* have highlighted the fast growth of the solar industry in China and across Europe. Whether it is the IMEC in Belgium or the Fraunhofer Institute in Germany, collaborative research in solar technology is gaining support abroad.

Back in July, this committee heard testimony outlining the history of thin-film solar technologies that have created two of the most successful solar companies in the world: First Solar and Unisolar. These companies are technology leaders, and they got their start with the support of DOE research. The research that led to these technologies, and current research that can drive down the cost of manufacturing them, is largely the result of research grants from our Department of Energy.

We invented this technology, but we must continue to work hard to retain our leadership. That is the essence of my bill.

In the early 1980's the global competitive landscape for semiconductors was similar to the landscape for solar today. By increasing communication between the diverse members of the semiconductor supply chain, the U.S. industry was able to develop standards and avoid the duplication of research efforts. Through organized coordination efforts and an increased focus on developing manufacturing technologies, the U.S. gave rise to semiconductor giants like Intel and AMD. The result of these coordinated R&D efforts was that the U.S. continued to lead the world in semiconductor development.

Today, solar researchers in the U.S. find themselves in a similar situation. To maintain a competitive advantage they must come together to meet their common, pre-competitive goals—whether in simulation, developing new materials, energy storage, power and grid management, mounting, or even weather forecasting.

This bill asks the Department of Energy to engage stakeholders and work across programs to create a comprehensive plan—a roadmap—to guide funding for the research needed to make the U.S. **the** global center for Solar innovation. It aims to make DOE responsive to the solar industry, and to encourage increased collaboration and communication across technologies. Connecting research from early stage all the way through to deployment, supporting research in areas that benefit the solar industry as a whole and shepherd promising technologies through the "Valley of Death" will help the U.S. retain its position as a leader in solar technology.

The U.S. has an opportunity to be the leading developer and exporter of clean solar technologies in the coming years and decades. My bill is designed to advance that goal and I urge my colleagues to support it.

Chairman BAIRD. Ms. Giffords, thank you for your eloquent remarks and your leadership on this issue, which as you said so well, obviously your state is very influenced by this but it affects the entire Nation and it would be a real tragedy if the United States lost its leading role, and there is a real possibility that that will happen with many other nations making very vigorous commitments. I applaud you for this bill.

I now recognize Mr. Inglis to present any remarks.

Mr. INGLIS. Thank you, Mr. Chairman.

Interest in new solar projects is booming right now though our domestic manufacturing capabilities are lagging behind international trading partners. This bill seeks to change that through an energized research program and a roadmap that will direct research and development according to specific near, mid and long-term goals. This roadmap should leave room for the unforeseeable opportunities that may come up at DOE or as DOE, academia and the private sector continue investing in solar research.

It may also be necessary to reconsider the authorization levels included in this bill as they are considerably above the current base budget for solar power.

I would like to applaud Ms. Giffords for her dedication to make the United States a leadership in solar power and solar technologies and look forward to discussing this bill further.

PREPARED STATEMENT OF REPRESENTATIVE BOB INGLIS

Interest in new solar projects is booming right now, though our domestic manufacturing capabilities are lagging behind international trading partners. This bill seeks to change that through an energized research program and a Roadmap that will direct research and development according to specific near-, mid-, and long-term goals. This roadmap should leave room for the unforeseeable opportunities that may come up as DOE, academia, and the private sector continue investing in solar research. It may also be necessary to reconsider the authorization levels included in this bill, as they are considerably above the current base budget for solar power.

I'd like to applaud Ms. Giffords for her dedication to making the United States a leader in solar power and solar technologies.

Chairman BAIRD. Thank you, Mr. Inglis.

Are there others who wish to be recognized?

Dr. Ehlers.

Mr. EHLERS. Thank you, Mr. Chairman. During the energy situation we have had in the past few years and the future projections, more and more people talk about the need for alternative sources of energy. We talk about it a lot too and we try to do something about it, but I think we are missing the point on a couple of things. I am amazed at the number of things that the Federal Government has decided should be supported with tax credits or some other means of support. For example, I see in the paper every day, put better windows in your house, the Federal Government will pay you $1,500 and things like that. I wish we would be as serious about alternative energy sources, and solar energy has the potential of being most useful when it is widely dispersed. In other words, I am very skeptical about the big solar farms that people talk about building. That is very expensive and the amount of energy you get is going to be quite costly, but if you get people—if we develop solar shingles or if we get people to put solar panels on their houses, it is directly attached to the devices that are going to use the energy and this is certainly better than some of the subsidies that we are giving now for things that are not going to have as much payoff. So it really devolves to a question, and I am sorry I haven't had time to study your bill, Congresswoman Giffords, but to what extent does this bill also include incentives for individuals to put solar devices on their buildings, their houses, their offices? To what extent does it support manufacturers who are trying to develop new solar technologies and are doing research and development on it and trying to sell them to individuals? I yield to you.

Ms. GIFFORDS. Thank you, Mr. Ehlers. What this bill would do—and I spoke earlier about the semiconductor industry in the 1980s—it lays out a roadmap so ramping up over a course of years at 75 percent of DOE's funding towards any solar technology would have to comply with the roadmap commission's decisions and the members will serve three years and they will cycle off to allow for new people to come on to the commission. It directs the DOE to conduct a research, development and demonstration program for solar technologies which would include all the technologies from

CSP to photovoltaics to hot water to solar space heating and cooling, lighting, manufacturing and integration for solar technologies in buildings, and then it would award grants where they are merited. What we have seen in the past is that DOE has focused on DOE, and we want it to be more competitive. So the grants can be awarded to academic institutions, the national labs, federal research agencies, state research agencies, non-profits, industrial entities and consortia thereof. So it really is a funding mechanism based on where we should be going nationally, and we learned so much through the semiconductor process that again to be reinventing the wheel and to have these companies not collaborating and coordinating sets them behind. So we don't specifically look at any specific type of technology. The roadmap is created through this, you know, multi-member commission to look at all types of research that is available and then grants are awarded, you know, 75 percent ramping up to 75 percent of DOE's solar research funding. It won't just be a hodgepodge. It will actually go through this process and allow for better collaboration and coordination.

Chairman GORDON. Would the gentleman yield?

Mr. EHLERS. Yes, I yield, and then I want to respond.

Chairman GORDON. I think the purpose of this legislation is to develop the research so that those products will be available, the shingles, as Mr. Rohrabacher points out, with nano and solar combined in paint, you can even, you know, paint it on your house. And so this will make those products available. It will probably be up to the Ways and Means Committee to provide the tax incentives to allow the products to be integrated on a large-scale basis. I yield back. Thank you.

Mr. EHLERS. And I thank both you for your comments. My point is simply that we have done a lot of research. There is a lot of research going on. I encourage that and I certainly support what you are trying to do. But my point is simply that if the Federal Government is giving tax credits to people to put in new furnaces, to put in new windows, et cetera, we as a Congress should start thinking seriously about if we are going to do that, we should also be supporting alternative forms of energy which may be a more efficient way of getting the money out there and using the money rather than just giving tax credits for things which may or may not be good, may or may not be necessary.

I had the people who installed my furnace 10 years ago talk to me and say hey, we have got this tax credit now, you really should put in a new furnace. I said well, I don't really need it—well, it doesn't matter, you can get $1,500 now so I encourage you to do it before it wears out. Well, I hope I have at least another 10, 15 years of that furnace. So my point is simply we ought to be talking about and working with our colleagues on sharing the wisdom of this committee on what tax credits make sense and which ones don't, and I recognize it is the Ways and Means' jurisdiction but I think they could benefit from some scientific assistance as well. I yield back.

Chairman BAIRD. Thank you, Dr. Ehlers.

Dr. Bartlett, another scientist who will offer his wisdom.

Mr. BARTLETT. I would like to echo what Dr. Ehlers has said. Before this recession, oil was $150 a barrel. The IEA and the EIA had

both noted that world oil production had been flat for the last three years and of course with a flat oil production and increasing demands, that is why oil was $150 a barrel. Now we have had this recession which has bought us some time. There is an old saying, it is an ill wind that blows no good, and one of the few benefits of this recession is that it has bought us some time where we could have aggressively pursued the development of alternatives. Except for what this committee has done, I see little evidence that our country has paid any attention to the necessity of aggressively pursuing alternative energy because the sad fact is that unless we do that, the world never, ever again will have sustained good times because as soon as the world's economies come back, the demand for oil will go up. It will be $150, $200, $250 a barrel and that will squelch the economy again. So kudos to this committee and sadly, I note that our country has taken and the world has little advantage of the time that has been bought by this recession, so thank you very much for what you are doing here.

Chairman BAIRD. Thank you, Dr. Bartlett. Are there others wishing to comment on the bill?

Mr. TONKO. Just briefly. I would like to compliment the sponsor of the bill. I think that we in this country need to make solar a legacy piece, especially in light of the opportunities that have been showcased in other countries where they are dealing with solar hot water, their concepts in Germany where they are relying more and more on solar power, and in this Nation there are many regions of the country that have more solar power hours than some of these already emerging nations and so I think the investment in R&D allows us to shave some of the priceyness off of the option and allows us to take—if cap-and-trade legislation were signed into law, would allow us to take much of those resources and piggyback them with this legislative idea and the initiatives there can be very, very strong and powerful in talking about the direction this country needs to go and the impact that it needs to make. Cap-and-trade legislation coupled with Ms. Giffords' legislation would be a powerful statement and so I applaud the sponsor.

Chairman BAIRD. Thank you, Mr. Tonko. Are there any other comments?

Ms. GIFFORDS. Mr. Chairman, I would just like to respond to a couple of things very briefly——

Chairman BAIRD. The gentlelady is recognized.

Ms. GIFFORDS.—to respond to Mr. Bartlett. Mr. Bartlett, before I got to the Congress, I used to always talk about alternative energy just like you talked about, and, you know, I have noticed that I had a constituent that approached me and said you know what, solar and wind and these other types of energy, you know, when you call it alternative, people think that it is not serious energy. So I really tried to correct myself and referred to them as renewable energy or clean energy because when people still have this belief out there that it is an alternative, that it is some sort of fringe type of energy, they don't take the technology as serious. You know, other countries have moved ahead and they are powering extraordinary amounts of their economy and their innovation and looking at their security. We are not there yet. Obviously with the

leadership of this committee I think we will get there. But, you know, I always try to catch myself, and words matter.

The second thing, and I wanted Mr. Ehlers to know as well that part of this bill has a photovoltaic performance study that the DOE will actually publish and we are making sure that it is published on the Internet so that everyone has access to it, not just Members of Congress or it is not going to be just thrown in a drawer somewhere, but best practices to improve performance of photovoltaic installations, federal, State and local incentives as well as to enhance system performance, so we are going to make all of this work that comes out of the roadmap as accessible to everyone as possible because that is the way that folks that aren't close to Washington or aren't close to a DOE lab will be able to benefit from the work that is done by the Roadmap Committee members.

And finally, I just want Members to know that we have done a lot of work and staff has been great on both sides to make sure that Department of Energy has had their full involvement with the crafting of this legislation. We have had the private sector, all different types of solar companies, manufacturing from CSP to photovoltaics involved in the drafting of this legislation, research institutions as well, and the nice thing is that everyone agrees that, you know, this isn't about one technology or another, one company, one region. It is really about that global roadmap for us here in the United States to be able to make sure that we take our resource and use them wisely. So I just thank all the folks that have contributed. If there are additional ideas, and I know that we have an amendment coming up, but you are welcome to incorporate them. But it is exciting that we are going to actually have a path and a plan for this new type of technology for us.

Mr. EHLERS. Will you yield?

Ms. GIFFORDS. Oh, of course, Mr. Ehlers.

Mr. EHLERS. Thank you for yielding. I would just like to add to my comments. I agree with you, "alternatives" is not a particularly attractive term to use but if you really want to be accurate, what we are talking about is solar energy. Wind energy is caused by differential heating of the Earth's atmosphere by the sun. Hydropower is solar energy because the sun evaporates water and it gets up in the sky, falls behind a dam and you collect energy as it goes through the turbines. You go right down the line. The only real sources of energy we have are solar, fossil and nuclear. Those are the three major categories. Some people refer to nuclear as alternative. It is not. It has been around a while. I just want to support what you are doing and what you are saying but let us realize that the term "alternatives" doesn't mean much to me as a scientist or to the public as a layperson. If you really want to be serious, all these are types of solar collecting and solar flux that is coming to the Earth daily, and if you actually sit down and calculate how much energy is contained in the sunlight hitting the Earth in a day, all the energy contained in all the fossil fuels we know about in the Earth is less than a few weeks of solar energy. We get abundant energy from the sun. We are just not using it properly. Thank you.

Chairman BAIRD. Thank you, Dr. Ehlers.

With that, I will ask unanimous consent that the bill is considered as read and open to amendment at any point and that Members proceed with the amendments in the order of the roster. Without objection, so ordered.

The first amendment on the roster is an amendment offered by the gentleman from Maryland, Dr. Bartlett. Dr. Bartlett, are you ready to proceed with your amendment?

Mr. BARTLETT. I have an amendment at the desk.

Chairman BAIRD. The Clerk will report the amendment.

The CLERK. Amendment to H.R. 3585, amendment number 015, offered by Mr. Bartlett of Maryland.

Chairman BAIRD. I ask unanimous consent to dispense with the reading. Without objection, so ordered. I recognize the gentleman for five minutes to explain his amendment.

Mr. BARTLETT. To help you understand how supportive I am of this legislation, you need to know that I have been using solar energy electricity for 25 years. In the late 1970s and early 1980s, I was a home builder and I built—I still am the largest solar home builder in Frederick County, so I was building solar homes in the late 1970s and early 1980s before it was cool to do that.

Thank you, Chairman Baird, Ranking Member Inglis as well as Ms. Giffords for introducing this legislation. First of all, I would like to echo Chairman Baird, Mr. Inglis and Ms. Giffords. We are united in our belief that it is imperative for the Congress to adopt policies that will maximize the effectiveness of Federal Government programs to promote solar and other renewable sources of energy. As a scientist and engineer, I know that any program could be improved if the rules equally reward constant review and incremental improvements as well as their replacement by innovations. I support the continuation, creation and funding of programs at DOE that will empower America's scientists, engineers and entrepreneurs to engage in and accelerate cutting-edge research in new technologies. I would like to implore and encourage this committee to make sure that the bill this committee will approve takes a technology-neutral approach to solar energy research and development programs.

There is a danger in explicitly delineating research in known technologies and approaches. Congress can inadvertently direct the Federal Government to pursue an industrial policy or corporate welfare approach that would discourage research in new areas that could yield unforeseen benefits. I am sure Madame Curie could have had no notion of what her discovery would lead to.

I would also be cautious about empowering a committee to choose winners and losers of taxpayers' money. By doing so, Congress can similarly inadvertently direct the flow of money through an old boys' network that excludes support for revolutionary innovations.

And now to my specific small amendment. My amendment very simply corrects what I am sure was an inadvertent exclusion from the draft of H.R. 3585. My amendment would extend Section 605 and 606 of the *Energy Independence and Security Act of 2007.* Section 605 and 606 were amendments to this bill that were unanimously approved by this committee. These new programs have not yet been funded. It is premature for Congress to send the potential message that these programs should be excluded from the Depart-

ment of Energy's solar R&D programs before they have even been started. Specifically, Section 605 is the direct solar pipe daylighting program that I co-sponsored with Congressman Tom Petri of Wisconsin. Solar light pipe technology brings the power of sunlight to illuminate the interiors of buildings without electricity. Daylighting provides an important alternative or traditional power generation for lighting that promotes greater energy conservation and improved energy year round.

Section 606 established a research, development and demonstration program to promote more reliable, decentralized and distributed and we hope more cost-effective solar-powered air conditioning for individuals and businesses. Most people don't understand that you can cool your house with heat. You can do that. Creation of the program as a part of this bill was supported by the Solar Energy Industries Association, Western Renewables Group, Austin Energy, Sacramento Municipal Utility District and San Diego Gas and Electric. Solar-derived air conditioning could provide less vulnerable onsite decentralized and distributed cooling, reduce peak load electricity demands, particularly in desert climates, during the summer as well as contribute to greater resilience of our grid.

I urge and request support for the adoption of this amendment to explicitly extend Section 605 and 606 in this bill. Thank you very much.

[The prepared statement of Mr. Bartlett follows:]

PREPARED STATEMENT OF REPRESENTATIVE ROSCOE G. BARTLETT

Thank you Chairman Baird, Ranking Member Inglis as well as Ms. Giffords for introducing this legislation.

First, I would like to echo Chairman Baird, Mr. Inglis, and Ms. Giffords. We are united in our belief that it is imperative for the Congress to adopt policies that will maximize the effectiveness of Federal Government programs to promote solar and other renewable sources of energy.

As an engineer, I know that any program can be improved if the rules equally reward constant review and incremental improvements as well as their replacement by innovations. I support the continuation, creation and funding of programs at DOE that will empower America's scientists, engineers and entrepreneurs to engage in and accelerate cutting edge research and new technologies. I would implore and encourage this committee to make sure that the bill this committee will approve takes a technology neutral approach to solar energy research and development programs.

There is a danger in explicitly delineating research in known technologies and approaches. Congress can inadvertently direct the Federal Government to pursue an industrial policy or corporate welfare approach that would discourage research in new areas that could yield unforeseen benefits. I would also be cautious about empowering a committee to choose winners and losers of taxpayers' money. By doing so, Congress can similarly inadvertently direct the flow of money through an old boy's network that excludes support for revolutionary innovations.

My amendment, very simply corrects what I am sure was an inadvertent exclusion from the draft of H.R. 3585. It would extend Sections 605 and 606 of the *Energy Independence and Security Act of 2007.* Sections 605 and 606 were amendments to EISA that were unanimously approved by this committee. These new programs have not yet been funded. It's premature for Congress to send the potential message that these programs should be excluded from the Department of Energy's solar R&D programs before they've even started.

Specifically, Sect. 605 is the Direct Solar Pipe Daylighting program that I co-sponsored with Congressman Tom Petri of Wisconsin. Solar light pipe technology brings the power of sunlight to illuminate the interiors of buildings without electricity. Daylighting provides an important alternative to traditional power generation for lighting that promotes greater energy conservation and improved efficiency year-round.

Sect. 606 established a research, development and demonstration program to promote more reliable, decentralized and distributed and, we hope, more cost-effective solar-powered air conditioning for individuals and businesses. Creation of the program as part of EISA was supported by the Solar Energy Industry Association (SEIA); Western Renewables Group; Austin Energy; Sacramento Municipal Utility District, and San Diego Gas & Electric. Solar-derived air conditioning could provide less vulnerable on-site, decentralized and distributed cooling, reduce peak load electricity demands, particularly in desert climates and during the summer, as well as contribute to greater resilience of our grid.

I urge and request support for the adoption of this amendment to explicitly extend Sect. 605 and Sect. 606 of EISA in H.R. 3585.

Chairman BAIRD. Is there further discussion on the amendment?

Ms. GIFFORDS. Mr. Chairman.

Chairman BAIRD. Ms. Giffords.

Ms. GIFFORDS. I appreciate Mr. Bartlett's work, and these were bills that we worked on over the last couple of years and I appreciate the inclusion, and you have terrific ideas and that is what I like about this committee so much. It is truly a bipartisan committee. Everyone has good ideas. And when it comes to solar, we just need to get going on it, so bring your ideas on and I am looking forward to this bill making it to the President's desk.

Chairman BAIRD. I thank the gentlelady.

Dr. Ehlers.

Mr. EHLERS. Thank you, Mr. Chairman. I just want to add to this a little tidbit that I want to pass on to the Committee. A few weeks ago we had testimony from one of the commissioners of FERC, Federal Energy Regulatory Commission, and I had a good conversation afterwards with staff members who were here, and I said I really should learn more about FERC. Well, they invited me over and yesterday I spent almost four hours there talking to them. A fascinating thing that you might want to see, the Chairman of FERC has decided that they should lead the way on efficient energy lighting, and so his office and all the areas around it are the most advanced possible. They don't have solar light pipes but they might. They try to make maximum use of the sun's energy coming through the windows. They have monitors which measure the ambient light level and they dim the lights or turn lights off as the light level coming through the windows changes. Also for the first time I saw what I regard as a really good use of LEDs, a fluorescent light fixture in which they put in light bars which contain LEDs, fairly expensive at this point but extremely energy efficient. And so there is so much to be done here, and I encourage the Chairman to arrange for any Members of the Committee who are interested to take the same tour. It is amazing what you can learn just a few blocks away from here if we just bother to go look. With that I yield back.

Chairman BAIRD. I keep waiting for Dr. Bartlett to invite us for a cookout, a vegetarian cookout at his home cooked on solar ovens. But in all seriousness, one of the things I admire greatly about Dr. Bartlett is, he not only talks the talk but he walks the talk and has done so for many, many years and so when he speaks about—you know, maybe we should not just call it renewable or alternative energy, maybe we should call it responsible energy, which has some implications for the other kinds of energy, but he knows whereof he speaks.

Mr. EHLERS. We could call it Bartlett energy.

Chairman BAIRD. Bartlett matters.

Mr. Diaz-Balart.

Mr. DIAZ-BALART. Thank you, Mr. Chairman. I just want to make sure that also one of the things that is looked at is some of the things that have not worked regarding solar energy. I think we are all familiar with the experience that Spain has had, for example, and we want to make sure that yes, I think research is important, that we obviously take the right steps and we don't do stupid things that would actually, you know, send us backwards and cause the taxpayer to have to eat a huge chunk of additional cost. And I know that is obviously not the intention, I just want to make sure that we are on the same track, that we make sure we do research for the good things but also they look at what has not worked, what has been a fiasco, what has been a disaster, what has been overly costly, what has been ineffective and inefficient, and I am sure that is obviously what the sponsor is looking at.

Chairman BAIRD. Thank you, Mr. Diaz-Balart.

Is there further discussion of the amendment? If no, the vote occurs on the amendment. All in favor say aye. Opposed, no. The ayes have it. The amendment is agreed to.

No further amendments having been offered, the vote occurs on the bill, H.R. 3585 as amended. All those in favor say aye. All those opposed, no. In the opinion of the Chair, the ayes have it.

I now recognize myself for a motion. I move that the Subcommittee favorably report H.R. 3585 as amended to the Full Committee. Furthermore, I move that the staff be instructed to prepare the Subcommittee report and make necessary technical and conforming changes to the bill in accordance with the recommendations of the Subcommittee.

The question is on the motion to report the bill favorably. Those in favor of the motion will signify by saying aye. Opposed, no. The ayes have it. The bill is favorably reported. Without objection, the motion to reconsider is laid upon the table. Members will have two subsequent calendar days in which to submit supplemental Minority or additional views on the measure.

With that, I thank my colleagues for their input and the outstanding staff for their work on this legislation, and with that, this markup stands adjourned.

[Whereupon, at 11:15 a.m., the Subcommittee was adjourned.]

Appendix:

H.R. 3585, Section-by-Section Analysis, Amendment Roster

I

111TH CONGRESS
1ST SESSION

H. R. 3585

To guide and provide for United States research, development, and demonstration of solar energy technologies, and for other purposes.

IN THE HOUSE OF REPRESENTATIVES

SEPTEMBER 16, 2009

Ms. GIFFORDS introduced the following bill; which was referred to the Committee on Science and Technology

A BILL

To guide and provide for United States research, development, and demonstration of solar energy technologies, 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 "Solar Technology Roadmap Act".

SEC. 2. DEFINITIONS.

In this Act:

(1) SECRETARY.—The term "Secretary" means the Secretary of Energy.

(2) SOLAR TECHNOLOGY.—The term ''solar technology'' means—

(A) photovoltaic technologies, including technologies utilizing—

(i) crystalline silicon;

(ii) cadmium telluride;

(iii) semiconductor materials containing copper, indium, and selenium;

(iv) thin film silicon;

(v) gallium arsenide alloy and multi-junctions;

(vi) dye-sensitized and organic solar cell technologies;

(vii) concentrating photovoltaics; and

(viii) other photovoltaic methods identified by the Secretary;

(B) solar thermal electric technology, including linear concentrator systems, dish/engine systems, and power tower systems;

(C) solar thermal water heating technology;

(D) solar heating and air conditioning technologies;

(E) passive solar design in architecture, including both heating and lighting applications; and

(F) related or enabling technologies, including thin films, semiconducting materials, transparent conductors, optics, and technologies that increase durability or decrease cost or weight.

TITLE I—SOLAR TECHNOLOGY RESEARCH, DEVELOPMENT, AND DEMONSTRATION

SEC. 101. PROGRAM.

(a) IN GENERAL.—The Secretary shall conduct a program of research, development, and demonstration for solar technology, including—

(1) photovoltaics;

(2) solar hot water and solar space heating and cooling;

(3) concentrating solar power;

(4) lighting systems that integrate sunlight and electrical lighting in complement to each other in common lighting fixtures for the purpose of improving energy efficiency;

(5) manufacturability of low cost, high-quality solar energy systems;

(6) development of solar technology products that can be easily integrated into new and existing buildings; and

(7) other areas as the Secretary considers appropriate.

(b) AWARDS.—The Secretary shall provide awards under this section on a merit-reviewed, competitive basis to—

(1) academic institutions, national laboratories, Federal research agencies, State research agencies, nonprofit organizations, industrial entities, or consortia thereof for research, development, and demonstration activities; and

(2) industry-led consortia for research, development, and demonstration of advanced techniques for manufacturing a variety of solar energy products.

(c) OBJECTIVE.—It is the policy of the United States that at least 75 percent of funding for solar technology research, development, and demonstration activities conducted by the Department of Energy after fiscal year 2014 support activities identified by and recommended under the Solar Technology Roadmap as described in section 102.

SEC. 102. SOLAR TECHNOLOGY ROADMAP.

(a) IN GENERAL.—Not later than 18 months after the date of enactment of this Act, the Solar Technology Roadmap Committee established under section 103 shall develop and transmit to the Secretary of Energy and the Congress a Solar Technology Roadmap that—

(1) presents the best current estimate of the near-term (up to 2 years), mid-term (up to 7 years), and long-term (up to 15 years) research, development, and demonstration needs in solar technology; and

(2) provides guidance to the solar technology research, development, and demonstration activities supported by the Federal Government for the purposes of meeting national priorities in energy security, United States competitiveness, climate change mitigation, and energy diversification.

(b) CONTENTS.—The Solar Technology Roadmap shall—

(1) identify research, development, and demonstration needs to address—

(A) the key solar energy production challenges of intermittency, transience, storage, and scaling, including determining—

(i) which solar-related technological solutions are appropriate for various applications, locations, and seasons;

(ii) how to store excess solar energy in batteries, supercapacitors, compressed air, flywheels, hydrogen, synthetic fuels, thermal storage, or superconductors, or through other means;

(iii) how and when to integrate solar energy into the electricity grid effectively, including—

(I) the integration of solar technologies with a Smart Grid;

(II) electrical power smoothing;

(III) microgrid integration;

(IV) solar resource forecasting;

(V) long distance transmission; and

(VI) ways to address arbitrage over minutes, hours, days, weeks, and seasons with respect to the full range of project scales; and

(iv) how best to integrate solar technologies into buildings;

(B) modeling and simulation;

(C) the design, materials, and manufacture of solar technologies, as well as related factory sciences;

(D) the development of standards;

(E) the need for demonstration facilities;

(F) optimized packaging methods; and

(G) environmental, safety, and health concerns including reuse, recycling, hazardous materials disposal, and photovoltaic waste issues;

(2) identify opportunities for coordination with partner industries such as those for semiconductors, LED lighting, energy storage, Smart Grid, and wind that can benefit from similar advances;

(3) establish research, development, and demonstration goals with specific timeframes with respect to solar technologies for—

(A) improving performance;

(B) decreasing cost of electricity generated;

(C) improving reliability; and

(D) decreasing negative environmental impacts and maximizing the environmental benefits of solar technologies by examining life-cycle assessments of greenhouse gas emissions, energy payback time, and water usage; and

(4) include recommendations, as appropriate, to guide solar technology research, development, and demonstration activities.

(c) REVISIONS AND UPDATES.—

(1) REVISIONS.—Once every 3 years after completion of the first Solar Technology Roadmap under this Act, the Solar Technology Roadmap Committee shall conduct a comprehensive review and revision of the Solar Technology Roadmap.

(2) UPDATES.—The Solar Technology Roadmap Committee shall update the Solar Technology Roadmap annually as necessary.

SEC. 103. SOLAR TECHNOLOGY ROADMAP COMMITTEE.

(a) ESTABLISHMENT.—Not later than 4 months after the date of enactment of this Act, the Secretary shall establish, and provide support for as necessary, a Solar Technology Roadmap Committee.

(b) MEMBERSHIP.—

(1) IN GENERAL.—The Solar Technology Roadmap Committee shall consist of at least 11 members. Each member shall be appointed by the Secretary from among subject matter experts representing—

(A) different sectors of the solar technology industry, including manufacturers and equipment suppliers;

(B) national laboratories;

(C) academia;

(D) relevant Federal agencies;

(E) relevant State and local government entities; and

(F) other entities or organizations, as appropriate.

(2) TERMS.—

(A) IN GENERAL.—Except as provided in subparagraph (B), the term of a member of the Solar Technology Roadmap Committee shall be 3 years.

(B) ORIGINAL TERMS.—Of the members appointed originally to the Solar Technology Roadmap Committee, approximately ⅓ shall be appointed for a 2-year term, approximately ⅓ shall be appointed for a 3-year term, and approximately ⅓ shall be appointed for a 4-year term.

(3) LIMIT ON TERMS.—A member of the Solar Technology Roadmap Committee may serve more than 1 term, except that such member may not serve a subsequent term unless 2 years have elapsed since the end of a previous term.

(4) INDUSTRY PARTICIPATION.—At least ⅓ of the members of the Solar Technology Roadmap Committee shall be individuals described in paragraph (1)(A).

(5) CHAIR.—The Secretary shall select a Chair from among the members of the Committee. The Chair shall not be an employee of the Federal Government.

(c) EXPERT ADVICE.—In developing the Solar Technology Roadmap, the Solar Technology Roadmap Committee may establish subcommittees, working groups comprised of experts outside the membership of the Solar Technology Roadmap Committee, and other means of gathering expert advice on—

(1) particular solar technologies or technological challenges;

(2) crosscutting issues or activities relating to more than 1 particular solar technology or technological challenge; or

(3) any other area the Solar Technology Roadmap Committee considers appropriate.

(d) FEDERAL ADVISORY COMMITTEE ACT.—The Federal Advisory Committee Act (5 U.S.C. App.) shall not apply to the Solar Technology Roadmap Committee.

SEC. 104. INTERAGENCY COORDINATION.

The Director of the Office of Science and Technology Policy shall coordinate Federal interagency activities identified in and related to the Solar Technology Roadmap.

SEC. 105. SOLAR TECHNOLOGY DEMONSTRATION PROJECTS.

(a) ESTABLISHMENT OF PROGRAM.—The Secretary shall establish a program to provide grants for demonstration projects to support the development of solar energy production, consistent with the Solar Technology Roadmap.

(b) IMPLEMENTATION.—In carrying out the demonstration program under this section, to the extent practicable, the Secretary shall—

(1) include at least 10 photovoltaic technology projects that generate between 1 and 3 megawatts;

(2) include at least 2 but not more than 3 solar thermal electric technology projects that generate greater than 30 megawatts; and

(3) make awards for projects that—

(A) are located and can be replicated at a wide range of sites;

(B) demonstrate technologies that address intermittency, transience, and storage challenges;

(C) facilitate identification of optimum techniques among competing alternatives;

(D) include business commercialization plans that have the potential for production of equipment at high volumes;

(E) improve United States competitiveness and lead to development of manufacturing technology;

(F) demonstrate positive environmental performance through life-cycle analysis; and

(G) satisfy other criteria that the Secretary considers necessary to carry out the program.

(c) GRANT AWARDS.—Funding provided under this section may be used, to the extent that funding is not otherwise available through other Federal programs or power purchase agreements, for—

(1) a necessary and appropriate site engineering study;

(2) a detailed economic assessment of site-specific conditions;

(3) appropriate feasibility studies to determine whether the demonstration can be replicated;

(4) installation of equipment, service, and support;

(5) operation for a minimum of 3 years and monitoring for the duration of the demonstration; and

(6) validation of technical, economic, and environmental assumptions and documentation of lessons learned.

(d) GRANT SELECTION.—Not later than 90 days after the date of enactment of this Act and annually thereafter, the Secretary shall conduct a national solicitation for applications for grants under this section. Grant recipients shall be selected on a merit-reviewed, competitive basis. The Secretary shall give preference to proposals that address multiple elements described in subsection (b).

(e) LIMITATIONS.—Funding shall not be provided under this section for more than 50 percent of the costs of the project for which assistance is provided. Not more than a total of $300,000,000 shall be provided under this section for the period encompassing fiscal years 2011 through 2015.

SEC. 106. PHOTOVOLTAIC PERFORMANCE STUDY.

(a) IN GENERAL.—Not later than one year after the date of enactment of this Act, the Secretary shall transmit to the Congress the results of a study that analyzes the performance of photovoltaic installations in the United States. The study shall assess the current performance of

1 photovoltaic installations and identify opportunities to im-
2 prove the energy productivity of these systems through
3 management, technology, and installation best practices.
4 Such study shall include—
5 (1) identification of the average energy produc-
6 tivity of current commercial and residential installa-
7 tions;
8 (2) assessment of areas where energy produc-
9 tivity is reduced, including wire loss, module mis-
10 match, shading, dust, and other factors;
11 (3) identification of practices and technologies
12 that improve energy productivity;
13 (4) analysis of the potential cost savings and
14 energy productivity gains to the Federal, State, and
15 local governments, utilities, private enterprise, and
16 consumers available through the adoption, installa-
17 tion, and use of high-performance photovoltaic tech-
18 nologies and practices; and
19 (5) an overview of current government incen-
20 tives at the Federal, State, and local levels that en-
21 courage the adoption of highly efficient photovoltaic
22 systems and practices.
23 (b) PUBLIC INPUT.—The Secretary shall ensure that
24 interested stakeholders, including affected industry stake-
25 holders and energy efficiency advocates, have a meaningful

opportunity to provide comments, data, and other information on the scope, contents, and conclusions of the study.

SEC. 107. SOLAR ENERGY PROGRAM REAUTHORIZATION.

(a) IN GENERAL.—There are authorized to be appropriated to the Secretary to carry out section 101(a)—

(1) $350,000,000 for fiscal year 2011;

(2) $400,000,000 for fiscal year 2012;

(3) $450,000,000 for fiscal year 2013;

(4) $500,000,000 for fiscal year 2014; and

(5) $550,000,000 for fiscal year 2015.

(b) ROADMAP IDENTIFIED ACTIVITIES.—The Secretary shall dedicate a percentage of funding received pursuant to subsection (a) for research, development, and demonstration activities identified by and recommended under the Solar Technology Roadmap in the following percentages:

(1) For fiscal year 2012, at least 30 percent.

(2) For fiscal year 2013, at least 45 percent.

(3) For fiscal year 2014, at least 60 percent.

(4) For fiscal year 2015, at least 75 percent.

(c) SOLAR TECHNOLOGY ROADMAP.—The Secretary may use up to $2,000,000 of the funds appropriated pursuant to subsection (a) for each fiscal year to support the

establishment and maintenance of the Solar Technology Roadmap.

(d) EXTENSION OF AUTHORIZATIONS.—Of funds authorized by subsection (a), there are authorized to be appropriated to the Secretary to carry out—

(1) section 602 of the Energy Independence and Security Act of 2007 (42 U.S.C. 17171) $12,000,000 for each of the fiscal years 2013 through 2015; and

(2) section 604 of the Energy Independence and Security Act of 2007 (42 U.S.C. 17172) $10,000,000 for each of the fiscal years 2013 through 2015.

SEC. 108. EXISTING PROGRAMS.

Except as otherwise specified in this Act, this Act shall supersede any duplicative or conflicting solar research, development, and demonstration programs within the Department of Energy.

SEC. 109. REPEALS.

The following are hereby repealed:

(1) The Solar Energy Research, Development, and Demonstration Act of 1974 (42 U.S.C. 5551 et seq.), except for section 10.

(2) The Solar Photovoltaic Energy Research, Development, and Demonstration Act of 1978 (42 U.S.C. 5581 et seq.).

(3) Section 4(a)(2) and (3) of the Renewable Energy and Energy Efficiency Technology Competitiveness Act of 1989 (42 U.S.C. 12003(a)(2) and (3)).

TITLE II—PHOTOVOLTAIC RECYCLING

SEC. 201. PHOTOVOLTAIC DEVICE RECYCLING RESEARCH, DEVELOPMENT, AND DEMONSTRATION.

(a) DEFINITION.—In this section, the term ''photovoltaic device'' includes photovoltaic cells and the electronic and electrical components of such devices.

(b) IN GENERAL.—In order to address the issues described in section 102(b)(1)(G), the Secretary shall award multiyear grants for research, development, and demonstration activities to create innovative and practical approaches to increase reuse and recycling of photovoltaic devices and, through such activities, to contribute to the professional development of scientists, engineers, and technicians in the fields of photovoltaic and electronic device manufacturing, design, refurbishing, and recycling. The activities supported under this section shall address—

(1) technology to increase the efficiency of photovoltaic device recycling and maximize the recovery of valuable raw materials for use in new products while minimizing the life-cycle environmental impacts such as greenhouse gas emissions and water usage;

(2) expanded uses for materials from recycled photovoltaic devices;

(3) development and demonstration of environmentally responsible alternatives to the use of hazardous materials in photovoltaic devices and the production of such devices;

(4) development of methods to separate and remove hazardous materials from photovoltaic devices and to recycle or dispose of those materials in a safe manner;

(5) product design and construction to facilitate disassembly and recycling of photovoltaic devices;

(6) tools and methods to aid in assessing the environmental impacts of the production of photovoltaic devices and photovoltaic device recycling and disposal;

(7) product design and construction and other tools and techniques to extend the life cycle of pho-

1 tovoltaic devices, including methods to promote their
2 safe reuse;
3 (8) strategies to increase consumer acceptance
4 and practice of recycling of photovoltaic devices; and
5 (9) processes to reduce the costs and environ-
6 mental impact of disposal of toxic materials used in
7 photovoltaic devices.
8 (c) MERIT REVIEW.—Grants shall be awarded under
9 this section on a merit-reviewed, competitive basis.
10 (d) APPLICATIONS.—Each application shall include a
11 description of—
12 (1) the project that will be undertaken and the
13 contributions of each participating entity;
14 (2) the applicability of the project to increasing
15 reuse and recycling of photovoltaic devices with the
16 least environmental impacts as measured by life-
17 cycle analyses, and the potential for incorporating
18 the research results into industry practice; and
19 (3) how the project will promote collaboration
20 among scientists and engineers from different dis-
21 ciplines, such as electrical engineering, materials
22 science, and social science.
23 (e) DISSEMINATION OF RESULTS.—The results of ac-
24 tivities supported under this section shall be made publicly
25 available through—

(1) development of best practices or training materials for use in the photovoltaics manufacturing, design, refurbishing, or recycling industries;

(2) dissemination at industry conferences;

(3) coordination with information dissemination programs relating to recycling of electronic devices in general;

(4) demonstration projects; and

(5) educational materials for the public produced in conjunction with State and local governments or nonprofit organizations on the problems and solutions related to reuse and recycling of photovoltaic devices.

(f) PHOTOVOLTAIC MATERIALS PHYSICAL PROPERTY DATABASE.—

(1) IN GENERAL.—The Secretary shall establish an initiative to develop a comprehensive physical property database of materials for use in photovoltaic devices.

(2) PRIORITIES.—The Secretary, working with private industry, shall develop a plan to establish priorities and requirements for the database under this subsection.

(3) COORDINATION.—The Secretary shall coordinate with the Director of the National Institute

of Standards and Technology and the Administrator of the Environmental Protection Agency to facilitate the incorporation of the database under this subsection with any existing ''green'' database for electronic manufacturing and recycling.

○

SECTION-BY-SECTION ANALYSIS OF
H.R. 3585, THE SOLAR TECHNOLOGY ROADMAP ACT

Sec. 1: SHORT TITLE

Gives short title of the bill as "Solar Technology Roadmap Act"

Sec. 2: DEFINITIONS

Provides definitions for "SECRETARY" and "SOLAR TECHNOLOGY"

TITLE I—SOLAR TECHNOLOGY RESEARCH, DEVELOPMENT, AND DEMONSTRATION

Sec. 101: PROGRAM

Directs the Secretary of Energy to conduct a research, development, and demonstration program for solar technology, including photovoltaics, concentrating solar power, solar hot water, solar space heating and cooling, solar lighting, solar manufacturing, and integration solar technology in buildings.

Any grants awarded must be merit reviewed. Grants may be awarded to academic institutions, national laboratories, federal research agencies, State research agencies, nonprofit organizations, industrial entities, or consortia thereof.

Paragraph (c) states that it is the policy of the United States that at least 75 percent of solar RD&D funding conducted by DOE after 2014 shall support activities identified by and recommended under the Solar Technology Roadmap described in Sec. 102.

Sec. 102: SOLAR TECHNOLOGY ROADMAP

Directs that within 18 months of enactment, the Solar Technology Roadmap Committee (established in Sec. 103) shall create the first Solar Technology Roadmap.

The roadmap shall present the best current estimate of the near-term (up to two years), mid-term (up to seven years), and long-term (up to 15 years) research, development, and demonstration needs in solar technology; and provide(s) guidance to the solar technology research, development, and demonstration activities supported by the Federal Government.

The purposes of the roadmap are:

1) to identify research, development, and demonstration needs for solar technology challenges;
2) identify opportunities for coordination with partner industries (such as those for semiconductors, energy storage, Smart Grid, etc.);
3) and expedite the process of improving solar technologies by identifying research goals that improve performance; decrease cost of electricity generated; improve reliability; and maximize the environmental benefits of solar technologies.

The Roadmap is subject to comprehensive revision every three years may be updated annually as needed.

Sec. 103: SOLAR TECHNOLOGY ROADMAP COMMITTEE

The Secretary of Energy shall appoint members of the Roadmap Committee within four months after enactment.

The Roadmap Committee must contain at least 11 members and the members serve three-year terms. One-third of the members of the committee must come from the solar industry. The Secretary chooses the Chair, but the Chair cannot be a Federal Government employee.

Sec. 104: INTERAGENCY COORDINATION

Interagency activities identified and recommended by the Solar Technology Roadmap shall be coordinated by the Director of OSTP.

Sec. 105: SOLAR TECHNOLOGY DEMONSTRATION PROJECTS

Authorizes the DOE to conduct at least ten photovoltaic projects ranging from one to three megawatts in size and two to three solar projects greater than 30 megawatts in size.

Sec. 106: PHOTOVOLTAIC PERFORMANCE STUDY

DOE shall study and publish best practices to improve performance of photovoltaic installations. The study shall examine the effectiveness of federal, State, and local incentives to enhance system performance.

Sec. 107: SOLAR ENERGY PROGRAM REAUTHORIZATION

Authorizes to be appropriated to the Secretary of Energy to carry out this Act $350,000,000 in FY 2011, $400,000,000 in FY 2012, $450,000,000 in FY 2013, $500,000,000 in FY 2014, and $550,000,000 in FY 2015. Of this funding, $2 million per year is authorized to support the establishment and maintenance of the Solar Technology Roadmap. This section also reauthorizes solar research activities established in the *Energy Independence and Security Act of 2007.*

Sec. 108: EXISTING PROGRAMS

Except as otherwise specified in this Act, this Act shall supersede any duplicative or conflicting solar RD&D programs within the DOE.

Sec. 109: REPEALS

This section repeals outdated solar research legislation from 1974, 1978, and 1989. A provision that is not repealed is Sec. 10 of the *Solar Energy Research, Development, and Demonstration Act of 1974,* which established the national laboratory that is now NREL.

TITLE II—PHOTOVOLTAIC RECYCLING

Sec. 201: PHOTOVOLTAIC DEVICE RECYCLING RESEARCH, DEVELOPMENT, AND DEMONSTRATION

This section establishes a program of RD&D in the reuse, recycling, and safe disposal of photovoltaic devices and substances used in the manufacture of such devices.

COMMITTEE ON SCIENCE AND TECHNOLOGY
ENERGY AND ENVIRONMENT
SUBCOMMITTEE MARKUP
September 30, 2009

AMENDMENT ROSTER

H. R. 3585, the *Solar Technology Roadmap Act*

No.	Sponsor	Description	Results
1	Mr. Bartlett	Amends Section 107 ("Solar Energy Program Reauthorization") to authorize $3,500,000 for each of the fiscal years 2013 through 2015, for the Secretary to carry out Section 605 of the Energy Independence and Security Act of 2007 ("Daylight Systems and Direct Solar Light Pipe Technology"). Further amends Section 107 to authorize $2,500,000 for each of the fiscal years 2013 through 2015, for the Secretary to carry out Section 606 of the Energy Independence and Security Act of 2007 ("Solar Air Conditioning Research and Development Program").	Agreed to by voice vote

AMENDMENT TO H.R. 3585
OFFERED BY MR. BARTLETT OF MARYLAND

Page 16, line 9, strike "and".

Page 16, line 13, strike the period and insert a semicolon.

Page 16, after line 13, insert the following new paragraphs:

1 (3) section 605 of the Energy Independence
2 and Security Act of 2007 (42 U.S.C. 17173)
3 $3,500,000 for each of the fiscal years 2013 through
4 2015; and
5 (4) section 606 of the Energy Independence
6 and Security Act of 2007 (42 U.S.C. 17174)
7 $2,500,000 for each of the fiscal years 2013 through
8 2015.

☒

XXII: PROCEEDINGS OF THE FULL COMMITTEE MARKUP ON H.R. 3585, SOLAR TECHNOLOGY ROADMAP ACT

WEDNESDAY, OCTOBER 7, 2009

HOUSE OF REPRESENTATIVES,
COMMITTEE ON SCIENCE,
Washington, DC.

The Committee met, pursuant to call, at 10:38 a.m., in Room 2318 of the Rayburn House Office Building, Hon. Bart Gordon [Chairman of the Committee] presiding.

Chairman GORDON. Good morning, everyone. The Committee will come to order. Pursuant to notice, the Committee on Science and Technology meets to consider the following measures: H.R. 3650, the *Harmful Algal Blooms and Hypoxia Research and Control Amendments Act of 2009,* H.R. 3585, the *Solar Technology Roadmap Act,* and H.R. 3598, the *Energy and Water Research Integration Act.*

First, we will consider a bill by the Subcommittee's Chairman, Brian Baird, and co-authored by Research and Science Education Ranking Member, Dr. Ehlers. H.R. 3650, the *Harmful Algal Blooms and Hypoxia Research and Control Amendments Act of 2009,* seeks to address the devastating effects that the rapid overproduction of algae can have on aquatic plant and animal life and human health.

The bill directs the National Oceanic and Atmospheric Administration to implement research strategies to better understand and respond to algal blooms and hypoxic events.

Next, we will consider H.R. 3585, the *Solar Technology Roadmap Act,* authored by the Space and Aeronautics Subcommittee Chair, Ms. Gabrielle Giffords. This bill instructs the Department of Energy to coordinate with public and private sector entities in developing a comprehensive, updated roadmap for solar research, development and demonstration activities in the United States.

This roadmap will be a critical tool in utilizing limited research dollars as effectively as possible to harness the truly immense solar resources we have in the United States.

Finally, we will take up H.R. 3598, the *Energy and Water Research Integration Act.* In the last Congress, this committee undertook a comprehensive review of federal research and technology development efforts focusing in on improving utilization of our precious water resources. We have since held five hearings and passed out of the House three bills pertaining to this important topic.

H.R. 3598, in which we will address the critical linkage between our nation's energy and water resources by directing the Department of Energy to better integrate water into existing federal energy research efforts.

The three bills we have before us today target several important research needs. And as always, we appreciate the Minority offering a number of valuable ideas and suggestions, and we have worked hard to incorporate almost all of them in an effort to improve these bipartisan bills.

I now recognize Mr. Hall to present his opening remarks.

[The prepared statement of Chairman Gordon follows:]

PREPARED STATEMENT OF CHAIRMAN BART GORDON

Good Morning. Today the Committee will consider three bills reported last week from the Energy and Environment Subcommittee.

First, we will consider a bill by the Subcommittee's Chairman, Dr. Baird, and co-authored by the Research and Science Education Ranking Member, Dr. Ehlers. H.R. 3650, the *Harmful Algal Blooms and Hypoxia Research and Control Amendments Act of 2009,* seeks to address the devastating effects that rapid overproduction of algae can have on aquatic plant and animal life and human health.

The bill directs the National Oceanic and Atmospheric Administration to implement research strategies to better understand and respond to algal blooms and hypoxic events.

Next, we will consider H.R. 3585, the *Solar Technology Roadmap Act,* authored by the Space and Aeronautics Subcommittee Chair, Ms. Gabrielle Giffords. This bill instructs the Department of Energy to coordinate with public and private sector entities in developing a comprehensive, updatable roadmap for solar research, development, and demonstration activities in the U.S.

This roadmap will be a critical tool in utilizing limited research dollars as effectively as possible to harness the truly immense solar resources we have in the U.S.

Finally, we will take up my bill, H.R. 3598, the *Energy and Water Research Integration Act.* In the last Congress this committee undertook a comprehensive review of federal research and technology development efforts focused on improving utilization of our precious water resources. We have since held five hearings and passed out of the House three bills pertaining to this important topic.

With H.R. 3598 we address the critical linkage between our nation's energy and water resources by directing the Department of Energy to better integrate water into existing federal energy research efforts.

The three bills we have before us today target several important research needs. As always we appreciate the Minority offering a number of valuable ideas and suggestions, and we have worked hard to incorporate almost all of them in an effort to improve these bipartisan bills.

Despite this, I see that the Minority will have a number of amendments. While it is unfortunate these concerns could not be resolved before the markup I look forward to a healthy debate on the amendments, and supporting these bills for final passage.

I thank you all for your attendance and participation this morning, and I look forward to a productive markup.

I now recognize Mr. Hall to present his opening remarks.

Mr. HALL. I thank you, Mr. Chairman, and today, as you have pointed out, we are marking up H.R. 3650, the *Harmful Algal Blooms and Hypoxia Research and Control Amendments Act of 2009,* H.R. 3585, the *Solar Technology Roadmap Act,* and H.R. 3598, the *Energy and Water Research Integration Act.* I would like to thank you, Mr. Chairman, and thank your staff for working with us, working with the Minority, on these bills and you helped us address as much as possible our concerns. Unfortunately, we were not able to come to an agreement on all of our concerns but I realize that that can't always be the case. I will elaborate on these when the bills are brought up for amendment. We will have amendments that address those areas of the bills that we feel still need some

attention, and particularly in the solar and energy and water bills. I do hope that the Chairman and other Members of this committee will give our amendments thoughtful consideration as we feel they are intended to improve the bills and enhance support for them.

With that, I yield back the balance of my time.

[The prepared statement of Mr. Hall follows:]

PREPARED STATEMENT OF REPRESENTATIVE RALPH M. HALL

Today, we are marking up H.R. 3650, the *Harmful Algal Blooms and Hypoxia Research and Control Amendments Act of 2009,* H.R. 3585, the *Solar Technology Roadmap Act,* and H.R. 3598, the *Energy and Water Research Integration Act.* I would like to thank you, Mr. Chairman, and thank your staff for working with us, working with the Minority, working with us on these bills and you helped us address as much as possible our concerns. Unfortunately, we were not able to come to an agreement on all of our concerns but I realize that that can't always be the case. I will elaborate on these when the bills are brought up for amendment. We will have amendments that address those areas of the bills that we feel still need some attention, and particularly in the solar and energy and water bills. I do hope that the Chairman and other Members of this committee will give our amendments thoughtful consideration as we feel they are intended to improve the bills and enhance support for them.

Chairman GORDON. Members may place statements in the record at this point.

[The prepared statement of Mr. Mitchell follows:]

PREPARED STATEMENT OF REPRESENTATIVE HARRY E. MITCHELL

Thank you, Mr. Chairman.

Today we will mark up H.R. 3650, the *Harmful Algal Blooms and Hypoxia Research and Control Amendments Act,* H.R. 3585, the *Solar Technology Roadmap Act,* and H.R. 3598, the *Energy and Water Research Integration Act.*

I would like to take a moment to speak about H.R. 3585, the *Solar Technology Roadmap Act,* legislation which I believe is critical in order to spur further research and development of solar technology.

We're lucky in Arizona to enjoy over 300 days of sunshine. We have a real opportunity to brighten our state's future by investing in solar energy research and technology.

As solar technology advances, I believe that Arizona will be a leader in clean, alternative energy production. Refocusing our energy production on alternative sources such as solar is critical for our national security and the environment.

Moreover, investing in solar energy is vital to Arizona's economy.

With the help of solar tax credits, Abengoa Solar and Arizona Public Service are developing the world's largest solar energy plant outside of Gila Bend. The Solana solar generating station will create 1,500 to 2,000 jobs and provide clean, emission-free energy for 70,000 homes. Solana is expected to ultimately spur $1 billion in economic development.

H.R. 3585, the *Solar Technology Roadmap Act,* would take us one step further toward making large scale solar energy production a reality. Specifically, this legislation would establish a Solar Technology Roadmap Committee tasked with creating a Solar Technology Roadmap to evaluate near-term, mid-term, and long-term research, development, and demonstration needs in solar technology. This committee would include stakeholders in the solar industry to provide insights on the deployment of this technology.

I urge my colleagues to support this important measure, and at this time, I yield back.

Chairman GORDON. We will now consider H.R. 3585, the *Solar Technology Roadmap Act,* and I recognize the Chairman of—well, we will recognize Mr. Hall to begin, Mr. Hall, on H.R. 3585.

Mr. HALL. Mr. Chairman, I thank you and I thank Representative Giffords for her working with us on your bill. While we are certainly supportive of solar energy and see great potential to be a

contributor of energy to our constituents, we do have concerns with the large authorization in the bill and requirement of funds to be directed to the roadmap recommendations.

First, the bill authorizes $2.25 million over five years, and that is a lot of money and one wonders if it would be better to provide at least some money for investment tax credits for solar energy or long-term incentives to develop renewable energy in general. That has kind of been the thrust of the past and there have been thrusts in the past on solar they are worthwhile thrusts. This is a worthwhile thrust.

Second, the bill directs the Secretary to spend a minimum increasing amount with no maximum limit of the authorization on the R&D set forth by the Roadmap Committee, at least one-third of which is made up of industry who are explicitly exempted from the *Federal Advisory Committee Act,* which is intended to provide an open and transparent process. The optics of this are that you really have a committee whose membership could be primarily industry telling the DOE where to direct taxpayer money or R&D that could benefit their companies by not having to answer to anyone or defend their recommendations, even when they fail, and then benefit by their own failure. I am sure this is not what Ms. Giffords intends or wants to happen but there is nothing in the legislation as written that would prevent it from happening. We do appreciate the inclusion at our request and our suggestion the language dealing with potential conflicts of interest in regard to Roadmap Committee membership. And with that, I yield back my time.

[The prepared statement of Mr. Hall follows:]

PREPARED STATEMENT OF REPRESENTATIVE RALPH M. HALL

Thank you Mr. Chairman, and thank you Representative Giffords for working with us on your bill. While we are certainly supportive of solar energy and see the great potential that it has to be a contributor of energy to our constituents, we do have some concerns with the large authorization in the bill and the requirement of funds to be directed to the roadmap recommendations.

First, the bill authorizes $2.25 billion over five years. This is a lot of money, and one wonders if it would be better to provide at least some money for investment tax credits for solar energy or long-term incentives to develop renewable energy in general.

Second, the bill directs the Secretary to spend a minimum increasing amount with no maximum limit of the authorization on the RD&D set forth by the Roadmap Committee—at least one third of which is made up of industry—who are explicitly exempted from the *Federal Advisory Committee Act,* which is intended to provide an open and transparent process. The optics of this are that you now have a committee, whose membership could be primarily industry, telling the DOE where to direct taxpayer money into RD&D that could benefit their companies while not having to answer to anyone or defend their recommendations. I am sure that this is not what Ms. Giffords intends or wants to happen, but there is nothing in the legislation as written that would prevent it from happening. We do appreciate the inclusion, at our suggestion, of language dealing with potential conflicts of interest in regard to Roadmap Committee membership.

With that I yield back the balance of my time.

Chairman GORDON. The author of the bill, the gentlelady from Arizona, Ms. Giffords, is recognized.

Ms. GIFFORDS. Thank you, Mr. Chairman and Ranking Member Hall. I appreciate some of the comments that were made by the Ranking Member and I know that there will be some amendments brought forward where we can more specifically talk about some of the concerns that the Minority has. I would just like to state that

one of the benefits of this committee is from a bipartisan standpoint, Members really understand and get renewable energy. We get clean energy. We understand it. I know some of the details is something that we go back and forth about. But I am excited by the fact that the United States has this tremendous potential for this resource. In fact, we have some of the best solar potential of any industrialized country in the world. We have enough solar power to power the whole country several times over, and of course, these resources are not limited to states like my State of Arizona or even to the Southwest. Major companies in Europe and China have been very aggressive over the last several years in building up their manufacturing capacity and competing internationally to meet the demands, and if our policies and innovation models for solar energy don't change, the United States may simply transition from importing foreign oil, which we do tremendously right now, to importing foreign-made solar panels. Our country actually invented the first photovoltaic technologies and we still have some of the smartest, most talented people in the world working to improve the efficiency and cost-effectiveness of solar cells today.

But in order to use our precious resource dollars as effectively as possible, these people, these patriots, in fact, need a serious roadmap and that is why I am so pleased to offer today's bill. After many substantive discussions with a wide range of industry and academic leaders as well as the Department of Energy, I believe there is a lot that the United States solar industry can learn from the experience of our national semiconductor industry years ago. About 20 years ago, the United States was in danger of losing its semiconductor industry to the Japanese. In response, the industry created a technology roadmap for semiconductors. The focus of the initiative was creating a roadmap that was to guide research and development efforts across the industry and by increasing communication between the diverse members of the supply chain, the United States semiconductor industry was able to develop standards and avoid the duplication of research efforts. These organized coordination efforts gave rise to the United States semiconductor giants like Intel and AMD and the United States continues to lead the world in semiconductor development.

Today, solar researchers in the United States are almost in the same exact situation. To maintain a competitive edge, they must come together to meet their common pre-competitive goals, whether in simulation, developing new materials, energy storage, power grid management, mounting or even weather forecasting.

Mr. Chairman, this bill would require the Department of Energy to engage diverse stakeholders in the solar community and work across programs to create a comprehensive plan, a roadmap, to guide funding for research needed to make the United States the global center for solar innovation. The roadmap would identify short-, medium- and long-term research goals and make recommendations on how to channel R&D resources to meet these goals. The bill would make DOE more responsive to our solar industry's needs and encourage increased collaboration and communication across technologies with well-vetted strategies.

I would like to thank my colleagues on both sides of the aisle for their contributions that have made this bill better. In fact, about

25 of the 28 changes in our manager's amendment were suggested or requested by the Minority. I also look forward to supporting several amendments offered by the Majority and the Minority today and greatly appreciate the sponsorship of Chairman Gordon, Chairman Baird, Mr. McCaul, Chairman Lipinski, Mr. Chandler, Mr. Luján and Mr. Tonko as well as several Members outside of the Committee. I want to be able to make sure the Members understand that industry leaders like IBM, SEIA, which has about 2,500 members, and National Semiconductor also support this. We have letters here from each of them (see Appendix). We also consulted with and received verbal support from First Solar, Unisolar, Applied Materials, Sun Power, and PC Recycling. Again, many are members of SEIA. In addition, we have also consulted with researchers from some of the premier solar universities—University of Delaware, Colorado State, George Washington University—as well as DOE's top program managers.

Just in closing, the United States has an opportunity to lead and be a developer and exporter of solar technologies in the coming years and decades, and I want this committee and this bill to be a part of that. The bill is designed to advance this goal and I urge my colleagues to support it.

[The prepared statement of Ms. Giffords follows:]

PREPARED STATEMENT OF REPRESENTATIVE GABRIELLE GIFFORDS

Thank you Mr. Chairman. The United States has some of the best solar resources of any industrialized country in the world—enough to power the whole country several times over—and these resources are not only limited to the American Southwest.

It turns out that our friends up north in Alaska have about the same solar resource as all of Germany. And yet, in 2006 Germany installed about seven times more solar power than the entire U.S.

Major companies in Europe and China have been very aggressive over the last several years in building up their manufacturing capacity and competing internationally to meet demand. If our policies and innovation models for solar energy don't change, the U.S. may simply transition from importing foreign oil to importing foreign-made panels.

This country actually invented the first photovoltaic technologies, and we still have some of the smartest, most talented people in the world working to improve the efficiency and cost-effectiveness of solar cells today.

But in order to use our precious research dollars as effectively as possible, these people—these patriots—need a serious roadmap, and that's why I'm so pleased to offer this bill today.

After many substantive discussions with a wide range of industry and academic leaders as well as the Department of Energy, I believe there's a lot that the U.S. solar industry can learn from the experience of our semiconductor industry.

20 years ago, the U.S. was in danger of losing its semiconductor industry to Japan. In response, the industry created the Technology Roadmap for Semiconductors. The focus of this initiative was creating a roadmap to guide research and development efforts across the industry.

By increasing communication between the diverse members of the supply chain, the U.S. semiconductor industry was able to develop standards and avoid the duplication of research efforts. These organized coordination efforts gave rise to U.S. semiconductor giants like Intel and AMD, and the U.S. continues to lead the world in semiconductor development.

Today, solar researchers in the U.S. are in a similar situation. To maintain a competitive advantage they must come together to meet their common, pre-competitive goals—whether in simulation, developing new materials, energy storage, power and grid management, mounting, or even weather forecasting.

This bill would require the Department of Energy to engage diverse stakeholders in the solar community and work across programs to create a comprehensive plan—a roadmap—to guide funding for the research needed to make the U.S. the global center for Solar innovation. The roadmap would be required to identify short-, me-

dium-, and long-term goals, and make recommendations for how to channel R&D resources to meet those goals.

The bill will make DOE more responsive to our solar industry's needs, and encourage increased collaboration and communication across technologies with well-vetted strategies.

I would like to thank my colleagues on both sides of the aisle for their contributions that have made this a better bill. In fact about 25 of the 28 changes in our manager's amendment were suggested or requested by the Minority.

I also look forward to supporting several amendments offered by both the Majority and the Minority today, and greatly appreciate the co-sponsorship of Chairman Gordon, Chairman Baird, Mr. McCaul, Chairman Lipinski, Mr. Chandler, Mr. Luján, and Mr. Tonko, as well as several Members outside of the Committee.

Another sign of the time and effort we all put into getting this bill right is that it's been endorsed by industry leaders including IBM, the Solar Energy Industries Association, and National Semiconductor. We also consulted with, and received verbal support from, First Solar, Unisolar, Applied Materials, Sunpower, and PC Recycling LLC, many of whom are members of SEIA. In addition, we consulted with researchers at the University of Delaware, Colorado State and George Washington University, as well as DOE's top solar program managers.

The U.S. has an opportunity to be the leading developer and exporter of clean solar technologies in the coming years and decades.

My bill is designed to advance that goal and I urge my colleagues to support it.

Chairman GORDON. Thank you, Ms. Giffords, for all your really diligent good work on bringing this bill to us. I know you have put a lot of effort into that.

Does anyone else wish to be recognized? Mr. McCaul is recognized.

Mr. MCCAUL. Mr. Chairman, let me voice my bipartisan support for this bill. I was proud to be a co-sponsor of this bill. While no bill is perfect, I think it really takes this country in the direction we need to go in terms of investments towards energy independence. My hometown of Austin, Texas, has become a green technology center. The University of Texas obviously was working on a lot of projects in this area, and I appreciate the gentlelady's leadership and involvement of the private sector on this commission with Applied Materials in my District and many other solar companies. This is exactly the direction I think we need to go since we are talking about being a true leader in this area. The smart grid technology that is in this bill is also I think a very, very good point to make, and, you know, again, we come from states with a lot of sunshine, Arizona and Texas, and I think we need to harness that energy. We are beginning to do that but there is a lot of advancement that needs to take place. There is a lot of technology challenges that need to take place including storage, transportation, transmission of that energy, and bringing the price down. Once these photovoltaics, the price comes down to a level that consumers, everyday consumer can purchase. I believe that this is one of the most promising areas of future energy that we have for this country.

So let me just again voice my support, and with that, I yield back.

Chairman GORDON. Thank you, Mr. McCaul.

Does anyone else wish to be recognized?

Mr. ROHRABACHER. Mr. Chairman.

Chairman GORDON. Let us see. Mr. Carnahan is recognized.

Mr. CARNAHAN. I want to thank Ms. Giffords and Mr. McCaul for their work on this bill and many others. I will just point out, this isn't just about sites that have a lot of sun. One of the world lead-

ers in solar technology and solar use is Germany, not exactly known as a pantheon of sunshine. So other states around our country can use this technology, benefit from it, and I think this is a great way to keep us in the forefront of this technology going forward. So thank you.

Chairman GORDON. Mr. Rohrabacher is recognized.

Mr. ROHRABACHER. Thank you very much, Mr. Chairman. Let me just note before I proceed that I have a history and a record of supporting solar energy research. When Republicans took the Majority in 1995, I was the Chairman of the Energy and Environment Subcommittee on this committee, and while we made dramatic cuts in other research like fusion research, I was not supportive of cutting solar power research, and so just to note that before I mention my objections to this particular bill.

If this bill was simply increasing the level of funding for direct research, I would be much more supportive, but frankly I just disagree with the entire approach that this bill represents otherwise. I mean, yes, we beat the Japanese in their competition from semiconductors and I doubt it is because we had more central planning than the Japanese had. What we have got here is a suggestion that we are on the edge of this great changeover to solar power, which I agree with and have been pushing for, and we are going to set up a commission to set a roadmap. You know, this just sounds—everything sounds—like a central plan. I mean, do we really need a commission. In Russian, "commission" means "Soviet." Do we really need to set up a Soviet commission and have our commissars, the commissioners, make a plan, a central plan, a five-year plan? Is that what really is going to bring progress, this change in our society? I don't think so. It is just a totally alien approach to what I believe. Now, there are honest disagreements as to how to bring about change. This is not the way to do it. We need to be encouraging dreamers who are not confined by a roadmap, entrepreneurs who are not confined by a roadmap, investors who are not confined by a roadmap. We need to free up people rather than restrict them and guide their energies. That is the whole difference in why America has succeeded in the past and not that we have had better commissions and better controls and better central plans than others.

And let me just note one other thing about this bill, which is, we can do all the research we want, we can have all the central plans we want into that research but unless we have got an implementation of the research, we should be—solar energy has reached the point now that we should be focusing on the implementation of solar energy or, much more important, eliminating the impediments in our society to the utilization of solar energy. We have 150, Mr. Chairman, 150 requests to build solar energy plants in the desert and we have at last come to the point where those solar plants would be competitive with gas-powered and coal-fired plants but the Bureau of Land Management hasn't approved one, not one of the 150 applications to move forward and actually implement and put this technology to work. I have a piece of legislation, I would invite all of my colleagues to join me, which would have the Bureau of Land Management facilitate these 150 requests and let us start using solar energy. But I would ask my colleagues to seri-

ously consider that and that will do much more to move along solar energy and actually promote the utilization of this great new technology that we have developed in these last 20 years than setting up a commission and having a five-year plan and making sure that we have got the roadmap and the controls necessary to get us to the other end of this journey.

Ms. GIFFORDS. Mr. Chairman——

Mr. ROHRABACHER. I certainly will yield to the gentlelady, who I respect.

Ms. GIFFORDS. Thank you, Mr. Chairman and Mr. Rohrabacher. What you are talking about is—and you have been here on this committee for a very long period of time—incredibly promising. There is so much development happening in solar. If you read the bill and if you will take the time to understand it, you will understand that this is not a plan for the entire solar industry. For example, the Department of Defense has a requirement that by 2025, 25 percent of their energy will come from a renewable energy resource so a lot of the research they are doing, they are moving forward in a very aggressive way, obviously not included in this. What this bill does is set a roadmap for federal R&D money coming from the Department of Energy, and that money has been spent in the past and it will continue to get spent, and instead of having some bureaucrats in the Department of Energy deciding where the money is going to go, this is an opportunity for the private sector, for the universities, for DOE to collaborate together to actually have a plan rather than a piecemeal effort for where federal R&D funds are going. So it is not a plan for the entire industry. There is a lot of innovation. There is a lot of other State funding and other types of federal dollars that will likely come forward.

Mr. ROHRABACHER. Reclaiming my time for one moment. I know I have actually run out of time and I will just say that I think piecemeal is better than directed. In many ways piecemeal and a broad approach is much better than an aimed approach. So with that said, thank you.

Chairman GORDON. Comrade Rohrabacher's time has expired. Before we go to amendments, is there anyone else that would like to speak? Dr. Ehlers is recognized.

Mr. EHLERS. Thank you, Mr. Chairman. First of all, I want to reassure Mr. Rohrabacher that I don't think we have to worry about commissars and the Soviet here. In this country, we call them czars and put them in the White House. But having said that and alienated more than half of my colleagues, I just want to—I know, Mr. Bush said it too. But in any event, I commend Ms. Giffords for her efforts I this. This is a field that desperately needs encouragement because the economics just haven't been there but they are very close to being there in a number of ways. First of all, you heard the comments about centralized power sources, which I am very skeptical of because you have to recognize that sunlight is everywhere. It is very diffuse. It is not good quality energy. It is what scientists call low-quality energy because of the thermodynamics of the sun's rays and it is very diffuse. It is everywhere. But if you have a diffuse source, you should have diffuse set of collectors, and the best way to do that is to have solar panels, and I would rather call them solar shingles, on every house in the country, and that

would be a real effective way of collecting solar energy. As someone observed, Germany is the leader. The point is, you do not direct sunlight but you do need sunlight, and so even with clouds the UV still gets through, a lot of energy still gets through and we can collect that. I spoke to some individuals from Dow Chemical just a few days ago and they believe they are at the point where solar shingles would be competitive with the price of ordinary shingles on housing. That totally changes the dynamic of this. Obviously it weakens the case for centralized collection and sending it out through electrical lines, transmission lines and so forth. If you can collect it on your house and use it on your house, that is by far the most efficient and least costly way of doing it. So suddenly we are reaching a point where there is a huge amount of development throughout the entire field of solar energy and I think it is very important that the help that the Department of Energy can give is making clear what the physical parameters are that you have to deal with. Not every company that gets into the solar business totally understands all the physics involved in photovoltaic collectors and so forth whereas we have the NREL Lab in Golden, Colorado, who have been studying this. As part of DOE, it has been studying this for years and that information and knowledge should be spread out. I would hope that this bill would lead, and it may have to be amended in time, but would lead to the DOE being a leader in solar energy, not in terms of just the funding research or anything like that but also by saying to companies, helping companies who want to develop solar energy, this is a pathway that will work and this is a pathway that will not work. We have a lot of good scientists in DOE. They have done a lot of good work, and I sometimes think they keep it too much to themselves. I always have chided the DOE directorate over the pat years that the one thing that has been done by a government agency that very directly improved energy efficiency and cut costs for business was EPA, believe it or not, with their Green Lights program where they went around the country and convinced businesspeople that they could put in efficient lights in the factories, their plants or offices and save money and use less energy and have more light, and it worked. The payback was typically a year and a half for the cost of putting these in. That is the sort of information that DOE should be getting out. Thank you very much.

Chairman GORDON. Thank you, Dr. Ehlers.

It looks like no one else is requesting time——

Mr. HALL. I would like time.

Chairman GORDON. Oh, so I am sure Mr. Inglis would like to yield to you.

Mr. INGLIS. Yes, Mr. Chairman. I would like to be recognized and I would be happy to yield to Mr. Hall.

Mr. HALL. I thank you, and I thank the very capable chairman.

Let me just say, I like the thrust of this bill, I like the goal of this bill. I like it so much, I went out to the beautiful State of Arizona with the author of this bill. I had a wonderful hearing out there, and I believe if we ever do control solar and have access to solar to where it would be in what we call paying quantities in the oil patch it would be wonderful. We could do without fossil fuels and never have any more fear of electrical breakdowns or the car-

bon in the air or anything. It is a laudy goal, and I pedestalize the author for a lot of reasons and that—it doesn't do me—I don't feel good criticizing her bill but let me just point out a few things that I hope she will look at as we wonder through and go ahead. I think you are going to pass it here. The previous votes we have taken today kind of indicate that you are probably going to prevail, and I have an old habit that I followed all my life. I ignore the impossible and cooperate with the inevitable, so I am trying to get along with the author of this bill. I am trying to get along with the source of the bill, the Chairman of the bill, those of you who are for the bill but I want to point out that at least a third of this Roadmap Committee made up of men and women of industry and they will have a right to vote on what they direct the DOE to do and the optics of this are that you have a committee whose membership could be primarily industry, it is primarily industry, a third, I think, telling the DOE where to direct taxpayer money and that industry could do a part of the thrust and part of the people who serve as contractors to the government and I don't see anything in here where it talks about it being open to the public. Maybe that is one reason—you know, they are explicitly exempted from the *Federal Advisory Committee Act.* I don't understand why that has to be in there because the very first thing, one of the first things in the Advisory Act is each advisory committee shall be open to the public. I don't see that anywhere in here. I think it is probably intended but just isn't here. On down on page 488, Section 12 of the *Federal Advisory Act,* it says each agency shall keep records that will fully disclose the disposition of any funds which may be made at disposal of the advisory committee and the nature of the extent of their activities. I think you are in a dangerous area there and I hope you will look at it very closely. I laud the goal but I have been lauding the goal on solar almost all my life and I am 86 years old, and I have a *Wall Street Journal* here that you might be interested in. It says renewable fuels may provide 25 percent of U.S. energy by 2025. That was in 2006. That is in November of this year. Now, I also have a *Wall Street Journal* dated August 22, 1978, solar power seen meeting 20 percent of needs by 2000. Carter—President Carter, that great, great man that gave away the Panama Canal, may seek outlay boost and it says federal planners have concluded that solar energy can contribute as much as 20 percent of the U.S. energy needed by so and so, and that is in 1978, obviously 22nd. We have been pursuing this. It is a good pursuit but we never before put $2.2 billion or $2.25 billion on the line and turn it over to a board that has very few restrictions and very few "thou shall nots." I hope you will look at that and I hope we can work together on that as we go through. I yield back my time.

Chairman GORDON. Thank you, Mr. Hall, and I will give Senator Baker your best also.

If there is no further discussion, then I ask unanimous consent that the bill is considered as read and open to amendment at any point and that the Members proceed with the amendments in the order of the roster. Without objection, so ordered.

The first amendment on the roster is a manager's amendment offered by the gentlelady from Arizona, Ms. Giffords. Are you ready to proceed with your amendment?

Ms. GIFFORDS. Yes, I am, Mr. Chairman.

Chairman GORDON. The Clerk will report the amendment.

The CLERK. Amendment to H.R. 3585, amendment number 064, offered by Ms. Giffords of Arizona.

Chairman GORDON. I ask unanimous consent to dispense with the reading. Without objection, so ordered.

I recognize the gentlelady for five minutes to explain the amendment.

Ms. GIFFORDS. Mr. Chairman, thank you. As I mentioned before in my opening remarks, we worked very closely with the Minority in crafting this amendment. In fact, the vast majority of the text was suggested or provided by my colleagues and their staff on the other side of the aisle, and it did make the bill better. Beyond technical changes, the amendment adds important language to address potential issues of conflict of interest among the Roadmap Committee members—Ranking Member Hall talked about this—actually capping the private industry participation on the Committee to no more than 50 percent, so by far the concerns that he brought up will not overrun the Roadmap Committee members in setting a minimum threshold of 33 percent at the base. The amendment also provides further guidance on establishing a photovoltaic materials database.

I would like to go back to some of the concerns that were brought forward by Ranking Member Hall about the issues of exemption of the

Federal Advisory Committee Act. We want the Solar Technology Roadmap Committee to be as nimble as possible with the ability to quickly respond to issues or opportunities as the need arises. While the FACA requirements make sense for some activities such as guiding long-term basic research programs conducted by the DOE Office of Science and NSF, they can be an obstacle to providing time-sensitive guidance for fast-growing industries like solar. We want the Roadmap Committee to have the flexibility it needs to be as effective as possible. A committee following FACA requirements must notice all meetings in the *Federal Register* well in advance. Also, FACA committees also have quorum requirements to meet and in some cases it may be more appropriate or productive for a subgroup to work on particular issues and topics. In addition, FACA committees automatically expire every two years unless the Administration works through the process of renewing them, which can further impede or delay committee actions. The Roadmap Committee's activities are still subject to the *Freedom of Information Act.* We will work with the Minority to address any concerns about FACA exemptions in the manager's amendment. Of course, we are happy to continue to work with Ranking Member Hall and other Members, but going back to this larger point about the private sector and private industry, frankly, I am a little surprised to be hearing from the Minority the concerns about the involvement from the private sector. The Department of Energy is not going to be delivering this technology. The technology is delivered through the private sector, through these businesses. These are the folks are on the front lines that are making the installations and rolling the panels out. They are not being manufactured at the Department of Energy. So I think it is exciting that

we will have industry representation and these folks are going to be at the table because again, we are not buying our panels from the Federal Government. We are not buying the concentrated solar power. We are not buying that. The organization that is going to deliver it is the private sector.

Mr. ROHRABACHER. Will the gentlelady yield for a question?

Ms. GIFFORDS. Yes, Mr. Chairman, I will yield.

Mr. ROHRABACHER. No, no, I am not a chairman anymore.

Ms. GIFFORDS. I know but——

Mr. ROHRABACHER. Thank you very much. Madam Chairman, let me just note that when you are talking about the industry having a say, if we are doing that, wouldn't it be better rather than having some big corporate interest that have their particular idea of what they are going to benefit for their company by the use of specific federal research direction, wouldn't it be better just to provide industry in general with a tax credit for that research and let them determine and other companies determine for themselves what the best way to use that research rather than having a central plan, et cetera, et cetera?

Ms. GIFFORDS. Mr. Rohrabacher, you know, I respectfully disagree. I think by having the private sector, by having a research institution and the Department of Energy working collaboratively so that eventually 75 percent of federal R&D funds will have to go through the roadmap, not all. Twenty-five percent will still not fall under the roadmap. I think it is exciting to have a plan rather than having a piecemeal approach to the R&D funding.

[The prepared statement of Ms. Giffords follows:]

PREPARED STATEMENT OF REPRESENTATIVE GABRIELLE GIFFORDS

Thank you Mr. Chairman. As I mentioned in my opening remarks, we worked very closely with the Minority in crafting this amendment, and the vast majority of the text was suggested or provided by my colleagues and their staff on the other side of the aisle. Beyond technical changes, the amendment adds important language to address potential issues of conflicts of interest among the Roadmap Committee members, and it provides further guidance on establishing a photovoltaic materials database. I urge all my colleagues to support this bipartisan contribution to a better bill.

Chairman GORDON. At approximately 12:15, I am being told we are going to have four amendments, so if there is no more discussion on the manager's amendment, then all in favor say "aye." All opposed, "no." The ayes have it and the amendment is agreed to.

The second amendment on the roster is an amendment offered by the gentleman from Michigan, Mr. Peters. Are you ready to proceed with your amendment?

Mr. PETERS. Mr. Chairman, I have an amendment at the desk.

Chairman GORDON. The Clerk will report the amendment.

The CLERK. Amendment to H.R. 3585, amendment number 018, offered by Mr. Peters of Michigan.

Chairman GORDON. I ask unanimous consent to dispense with the reading. Without objection, so ordered.

I recognize the gentleman for five minutes to explain the amendment.

Mr. PETERS. Thank you, Mr. Chairman. H.R. 3585 is certainly an important piece of legislation that is going to strengthen our nation's solar energy industry and help us meet our domestic goals

for renewable energy production. The bill will establish a roadmap and demonstration program to further advance solar technologies, and I commend the Committee for bringing this legislation forward.

My home State of Michigan is currently a leader in manufacturing of solar cells. We are the home to great companies like United Solar Ovonic, which supports many manufacturing and high-tech jobs in my area through their two production facilities in Auburn Hills and a global R&D headquarters in Troy. This company was also able to fill the void for workers in Greenville, Michigan, after a shutdown of an Electrolux plant and now operates and employs people there making solar panels. High-tech jobs like these are the source of hope in my state and provide workers an opportunity to apply their skills in a new industry and enter the workforce of the 21st century. Federal partnership is critical to effectively develop new renewable industries and those efforts should, to the greatest extent possible, work towards the creation of new U.S. jobs. These investments are key to restoring jobs lost in recent years.

For this reason, my amendment asks the Secretary to consider states that have been hit the hardest by the recession and which are experiencing high unemployment rates when providing awards under this program. There is a great potential to revitalize our domestic manufacturing base by strengthening the domestic solar industry. While states like Michigan and many others certainly have the existing infrastructure and workforce to manufacture more solar technologies, the United States continues to lag behind China, Japan and Europe in the manufacturing of photovoltaic modules. We must commit at the federal level to increase our domestic production of this technology if we are going to truly take advantage of the full economic benefits of a growing solar industry. My amendment states that the Secretary will strongly consider projects utilizing solar technologies manufactured in the United States in carrying out the demonstration program. The amendment also specifies that representatives from the domestic solar industry will be represented on the Solar Technology Roadmap Committee. Federal dollars should work to create American jobs, and this amendment seeks to ensure that this new program works towards that end.

I applaud the Committee's commitment to bolstering the U.S. solar industry and the development of this roadmap. I would like to thank Chairman Gordon, Ranking Member Hall, Chairman Baird, Ranking Member Inglis and the Subcommittee and Representative Giffords, the bill's sponsor, for considering this amendment and for bringing this important legislation forward. I urge my colleagues to support the adoption of my amendment and to join me in reporting the final bill favorably on this committee. I yield back.

[The prepared statement of Mr. Peters follows:]

PREPARED STATEMENT OF REPRESENTATIVE GARY PETERS

Thank you, Mr. Chairman,

H.R. 3585 is an important piece of legislation that will strengthen our nation's solar energy industry and help us meet our domestic goals for renewable energy production. The bill will establish a roadmap and demonstration program to further ad-

vance solar technologies, and I commend the Committee for bringing this legislation forward.

My home state of Michigan is currently a leader in the manufacturing of solar cells. We are home to great companies like United Solar Ovonic, which support many manufacturing and hi-tech jobs in my area through their two production facilities in Auburn Hills and global R&D headquarters in Troy. This company was also able to help fill the void for workers in Greenville, Michigan after the shutdown of an Electrolux plant, and now operates and employs people there making solar panels. Hi-tech jobs like these are a source of hope in my State, and provide workers an opportunity to apply their skills in a new industry and enter the workforce of the 21st Century.

Federal partnership is critical to effectively develop new renewable industries, and those efforts should, to the greatest extent possible, work towards the creation of new U.S. jobs. These investments are key to restoring jobs lost in recent years. For this reason, my amendment asks the Secretary to consider states that have been hit hardest by the recession and which are experiencing high unemployment rates when providing awards under this program.

There is a great potential to revitalize our domestic manufacturing base by strengthening the domestic solar industry. While states like Michigan and many others certainly have the existing infrastructure and workforce to manufacture more solar technologies, the United States continues to lag behind China, Japan, and Europe in the manufacturing of photovoltaic modules. We must commit at the Federal level to increase our domestic production of this technology if we are going to truly take advantage of the full economic benefits of a growing solar industry. My amendment states that the Secretary will strongly consider projects utilizing solar technologies manufactured in the United States in carrying out the demonstration program. The amendment also specifies that representatives from the domestic solar industry will be represented on the Solar Technology Roadmap Committee. Federal dollars should work to create American jobs, and this amendment seeks to ensure that this new program works towards that end.

I applaud the Committee's commitment to bolstering the US solar industry, and the development of this roadmap. I'd like to thank Chairman Gordon, ranking Member Hall, and Chairman Baird and Ranking Member Inglis of the subcommittee, and Representative Giffords—the bill sponsor—for considering this amendment and for bringing this important legislation forward. I urge my colleagues to support the adoption of my amendment and to join me in reporting the final bill favorably from this Committee.

Chairman GORDON. Is there further discussion on the amendment? If no, all in favor, say "aye." Opposed, "no." The ayes have it. The amendment is agreed to.

The third amendment on the roster is an amendment offered by the gentleman from New Mexico, Mr. Luján. Are you ready to proceed with your amendment?

Mr. LUJÁN. Thank you, Mr. Chairman. I do have an amendment at the desk.

Chairman GORDON. The Clerk will report the amendment.

The CLERK. Amendment to H.R. 3585, amendment number 028, offered by Mr. Luján of New Mexico.

Chairman GORDON. I ask unanimous consent to dispense with the reading. Without objection, so ordered.

I recognize the gentleman for five minutes to explain the amendment.

Mr. LUJÁN. Thank you very much, Mr. Chairman, and thank you, Congresswoman Giffords, for your work on this important bill.

My amendment expands the long-distance transmission research and development provision of the solar technology roadmap to include the development of direct current and superconducting long-distance transmission technology that our country increasingly uses the power of solar technology. States like New Mexico are positioned to be leaders in solar energy production but we must invest in the development of technology that will make it easier to

transmit power from region to region with advanced power lines that can carry power for hundreds of miles with minimum loss. The development of direct current and superconducting long-distance transmission technology can promote energy efficiency and reliability to any part of our country including remote locations and can access the solar resources that are abundant in the United States. Superconducting materials have almost no electrical resistance so they can carry large amounts of electricity with minimal electricity loss. However, today superconducting transmission technology is still very costly, and most superconducting electrical lines have only been used for short distances. Direct current transmission also reduces electricity loss from the line and takes large amounts of electricity from one point to another. Development and enhancement of these two technologies will benefit the long-distance transmission of electricity generated from the sun. I encourage my colleagues to support this amendment and the final bill, and I yield back my time.

Chairman GORDON. Is there further discussion on the amendment? If no, the vote occurs on—oh, excuse me, Mr. Rohrabacher—Comrade Rohrabacher.

Mr. ROHRABACHER. Comrade Rohrabacher, yes. Let me just note that Mr. Ehlers made some very significant points—he is a Ph.D., he is one of our great scientists along with Congressman Bartlett—about what he expects will be the most effective use of solar power. I happen to agree with his assessment, although my general approach to energy is that we should be going at it as many different directions as possible, again, not trying to focus but trying to go at a problem in many different directions. This amendment would permit us to utilize solar technology in yet another direction, meaning large-scale solar plants in the desert which I believe are something that we should at least move forward with to see if they are cost-effective, and I believe at this point they are cost-effective. Again, Mr. Luján, I support your amendment but also we need more than research. Even if we do it makes more efficient in transmitting solar energy that is produced by solar energy projects via the transmission lines that you are talking about, if the Bureau of Land Management will not give the companies that want to build these plants permission to do so, all of this research has been for nothing. It has been a total waste unless it is implemented.

So I want to draw the attention of my colleagues again to my bill, H.R. 964, which would require the Bureau of Land Management to act upon the 150 applications they already have rather than refusing to let anybody move forward in order to protect the habitat of some lizard or insect in the middle of the desert. Roadmaps aren't going to help if all the roads are closed and the bureaucrats won't let anybody proceed. So I support your amendment and I hope that we do, and I yield to Mr. Bilbray the balance of my time.

Mr. BILBRAY. Thank you. I will speak in favor of the amendment because this transmission issue does not just apply to solar. It is across the board. The fact is, the loss of power is a big issue. At the same time, I want to commend the gentleman's State of New Mexico that they have led by more than just spending money and putting mandates out but that their regulatory oversight is to a

point where our scientists in California who have major breakthroughs in green technology have to pack up out of California and bring that technology to New Mexico because your state has regulatory oversight that is encouraging the development of full green technology when California, who develops it—and this is really an analogy for the American people, that we can spend all the money on research, we can do all these breakthroughs but if the government doesn't get out of the road, the government doesn't stop being obstructionist, you are not going to have it. New Mexico has been great about that. And so I think we need to move forward but I also think we need to talk about this transmission issue of Federal Government and State governments mandating that people be on the grid no matter where they live rather than us going after, is anybody talking about getting people off the grid, make it legal to be off the grid, especially in rural areas like New Mexico where we have federal mandates that you have to hook people up rather than get them off the grid and go to this technology.

So I will strongly support the amendment and think that we just have to look at this as one of those steps that need to be made. The other step with transmission is, the Federal Government is not above it all at siting the lines to be efficient like we do with our interstate highway system. We expect the private sector to do all that study and research rather than having a coordinated effort in that transmission issue. I yield back.

Mr. ROHRABACHER. I yield back the balance of my time. Thank you.

Chairman GORDON. Is there further discussion on the amendment? If no, the vote occurs on the amendment. All in favor, say "aye." All opposed, "no." The ayes have it. The amendment is agreed upon.

The fourth amendment on the roster is an amendment offered by the gentlelady from Illinois, Ms. Biggert. Are you ready to proceed with your amendment?

Ms. BIGGERT. I have an amendment at the desk.

Chairman GORDON. The Clerk will report the amendment.

The CLERK. Amendment to H.R. 3585, amendment number 001, offered by Ms. Biggert of Illinois.

Chairman GORDON. I ask unanimous consent to dispense with the reading. Without objection, so ordered.

I recognize the gentlelady for five minutes to explain the amendment.

Ms. BIGGERT. Thank you, Mr. Chairman, and let me just say that even though Illinois is not known as the Sunshine State, I do think that this is a good bill but I have some concerns with it.

My amendment would sunset the Solar Roadmap Committee after five years. This would allow the Department to put out a roadmap and update but not dictate the focus of solar technology and research development and demonstration which would be for 15 years. Utilizing the expertise of industry, national labs, academia and other federal agencies to develop a roadmap for solar technology research is a good idea but I think that we may be creating more government with less oversight and ultimately do more harm than good.

I support the development of advanced solar technologies and recognize the energy security it can provide to our country. I am concerned, though, that we would be creating a function that exists in perpetuity. I think this is a crucial point for all research established in a timeline with goals and dedicated resources. Unfortunately, the energy and water conference report we just voted on last week contains over 80 earmarks with $76 million just in the Office of Science. In looking at that, there was an increase of $131 million over the 2009 appropriations so that means taking $76 million just for earmarks, and I think that this could have a devastating effect on research goals and we really can't afford to have this happen again. This is $2 million that would be spent on this committee really in perpetuity. So sunsetting the Solar Roadmap Committee we will set a course for measurable results, and this is true of all of the acts is that there is a sunset clause in there and, you know, it would be great to say that this committee has done such a great job that we would want to put it back into existence but I think that we need to have additional insight and I think—but we would be free to reauthorize or extend the Committee when that time comes but I think we always use this, as President Reagan said, that the closest thing to eternal life is a program in the Federal Government, and we don't want that to happen, so with that I would urge my colleagues to support, and yield back.

[The prepared statement of Ms. Biggert follows:]

PREPARED STATEMENT OF REPRESENTATIVE JUDY BIGGERT

Mr. Chairman, my amendment would sunset the Solar Roadmap Committee after five years.

This will allow the Department to put out a roadmap and update—not dictate—the focus of solar technology research, development and demonstration.

Utilizing the expertise of industry, national labs, academia and other federal agencies to develop a roadmap for solar technology research is a good idea, but I am concerned that we may be creating more government with less oversight—and ultimately doing more harm than good.

I support the development of advanced solar technologies and recognize the energy security it can provide for our country. I am concerned, though, that we could be creating a funding stream that exists in perpetuity.

This is a critical point for all research—establishing a timeline with goals and dedicated resources.

Unfortunately, the Energy and Water conference report we just voted on last week contained over 80 earmarks worth $76 million dollars—just in the Office of Science. This can have devastating effects on research goals. Can we really afford to have this happen again?

By sunsetting the Solar Roadmap Committee, we will set a course for measurable results.

In the event we feel additional insight is needed, Mr. Chairman, we will be free to reauthorize or extend the Committee when that time comes.

I urge my colleague support and yield back.

Thank you.

Chairman GORDON. Ms. Giffords is recognized.

Ms. GIFFORDS. Thank you, Mr. Chairman. Representative Biggert has two amendments today. I respectfully don't agree with the first one. The second one I do support, and let me tell you why. The purpose of this roadmap is to direct the DOE with the Committee, private sector, public sector researchers, a variety of members. That committee is controlled to look at short-term, which is defined by up to two years, mid-term, up to seven years, and long-term, up to 15 years, research, development and demonstration

needs in solar technology. So the problem with sunsetting this Act by 2015, it really doesn't make sense for the Committee's continued existence, because this is really the point of this committee is to create that short-, medium- and long-term plan for solar energy. So I understand Representative Biggert's concerns but I really think it would really undercut the relevance of the Committee's work if we were to sunset it in 2015.

Mr. BILBRAY. Will the gentlelady yield?

Ms. GIFFORDS. Yes.

Mr. BILBRAY. Would there be a date that you think would be appropriate like 2020 to come back and take a look at it?

Ms. GIFFORDS. And let me just say that, you know, just like we are all lawmakers and we work with the public sector by recommendations from private industry from federal agencies, if it gets to the point where solar technology is so effective and we have been able to achieve some of these objectives, which I know that we can do if really we focus on solar technology, there may not be a need for it. But I don't think by putting a commission together to ask them, again not directing all funding or all research and technology, it is federal R&D 75 percent as it is ramped up. You know, I think that would be a mistake to put a time frame on it.

Mr. BILBRAY. I know the gentlelady doesn't believe in the, you know, thresholds to bring it back and reconstitute it basically in perpetuity. I think in all fairness, anybody that asks our constituents, sunsets are something that the public really, really feels strongly about. It is just where the sunset ought to be, and I strongly encourage the author of this bill to give a sunset so that you give that level of assurance that this is not just an institution for its sake but it is one with an outcome base, and that sunset I think is a very important selling product for a bill that I strongly would like to support.

Ms. BIGGERT. Will the gentlelady yield?

Chairman GORDON. Will the gentlelady yield?

Ms. BIGGERT. I mean, I understand. I will certainly take your recommendations into consideration. At this point I don't think it is necessary. I mean, we have so far to go and we are so far behind but at this point I just don't—you know, I think we have more to gain by making sure that the private sector and the public understand that we are truly committed to solar energy.

Ms. BIGGERT. Will the gentlelady yield?

Ms. GIFFORDS. Yes.

Ms. BIGGERT. Thank you. You know, one-third to one-half of this committee is industry and I think it behooves us to, let us see with a review if they are doing their job because this isn't something that we usually do when we are putting this much money, and 75 percent of this money will be $1.2 billion and I think it is really necessary that we have a review, and that is all a sunset is, is just to make sure that they are doing their job.

Ms. GIFFORDS. And Representative Biggert, if you read the bill, the Committee must contain 11 members and these members will serve three-year terms. One-third of the industry must come from the solar industry. That is the base. But we also are going to have representatives from other areas as well, from DOE, from research institutions. So we put a ceiling on top just because of some of the

concerns that were brought up by the Minority but I really don't think it is necessary at this point to put a sunset provision in place.

Chairman GORDON. If the gentlelady would yield, I will point out that this committee obviously has jurisdiction of this bill and so has constant oversight, and should have the oversight and can at any point that it feels that it is not doing its job or its job has been done, just as we authorize it, we can deauthorize it.

If there is no further——

Mr. HALL. Mr. Chairman.

Chairman GORDON. Mr. Hall is recognized.

Mr. HALL. I just once again want to address the amount of the bill, the overall bill. That is not directed to this amendment. This amendment just requires a 15-year plan and is not any reason to fund the Committee indefinitely at taxpayers' expense but all this would be taken care of if they only left it under the *Federal Advisory Committee Act,* and I don't understand why they take it out from under it because at least a third of this committee is made up of industry. They absolutely ought to be under here. It is a federal act. It is an advisory committee and it ought to be under the *Federal Advisory Committee Act.* That way it would take care of this amendment, it would take care of any amendment about it being open to the public. Nowhere in here does it say it is open to the public, and we know when the openings are going to be. Nowhere in here does it say they are going to be available for public inspection. Nowhere do they say the detailed minutes of anything. All that would be required by the *Federal Advisory Act,* even the disposition of any funds, it is very important here where they are telling the Department of Energy how to spend that money and how much money to spend and when to spend it. That is controlled by the *Federal Advisory Committee Act,* compliance of the numbers. Any member of the staff of any advisory committee shall receive compensation in a rate as set by the *Federal Advisory Committee Act.* Those things are all taken care of. I will go a step forward on that other than the disposition of funds. All those things would be taken care of if they didn't put 15 percent of these people or a third of these people out of industry who have a direct interest in it.

There is no way in the world that you can control them, keep them from voting for something that could be contrary to the public good when it is to the good of the industry involved, and I think that gives rise to a lot of questions that are going to be brought up from this point forward.

Mr. BILBRAY. Parliamentary inquiry.

Mr. HALL. I support the amendment.

Mr. BILBRAY. Parliamentary inquiry.

Chairman GORDON. Yes, Mr. Bilbray.

Mr. BILBRAY. Mr. Chairman, would it be appropriate to amend the amendment before us, a second?

Chairman GORDON. A secondary amendment would be in order.

Mr. BILBRAY. When you felt it was appropriate, I would like to do a secondary amendment.

Chairman GORDON. To this amendment?

Mr. BILBRAY. Yes.

Chairman GORDON. It would be appropriate now.

Mr. BILBRAY. I would move that we amend the amendment to move the date to 2020, and to speak to the amendment. First of all, I am really kind of taken back at some of the conversations going on from our side of the aisle. I know that Mr. Hall flashes back to his days when he was a member of another political affiliation that took a habit of attacking participation of industry, so I have to say that I think the participation of industry is very important here and I think the authors put together a good coalition on this.

Chairman GORDON. Mr. Bilbray, I would suggest either Ms. Biggert needs to accept that or you need to put it in writing at the desk.

Mr. BILBRAY. Okay. That is why I was doing a parliamentary inquiry, Mr. Chairman.

Ms. BIGGERT. If the gentleman would yield?

Mr. BILBRAY. Yes.

Ms. BIGGERT. The problem is that the bill actually sunsets at 2015, so we would even be extending any review. The authorization is 2015 so we would be really extending the Committee to be reauthorized for another five years.

Mr. BILBRAY. Okay. Then the point of your motion was—

Chairman GORDON. I will point out that Ms. Biggert is somewhat correct in that the authorization, it doesn't end. I mean, it is not sunsetted but the authorization would expire at which time like we sometimes do. We either reauthorize it or not reauthorize it.

Ms. BIGGERT. Which is why 2015 was a good time to—

Chairman GORDON. So that means you are not accepting—

Mr. BILBRAY. I withdraw my motion.

Chairman GORDON. Okay. And—

Mr. HALL. Would the gentleman yield to me one minute before he—

Chairman GORDON. He just withdrew his amendment. Do you still want to speak to it?

Mr. HALL. Yes, I would like to. Even when I was a Democrat, the gentleman from California, I supported industry and jobs and I support them as a Republican. I don't believe, though, that they ought to have control of funding and how the money is spent or any direction to Congress or to the Department of Energy and something that they could be personally involved in. I want to have their input but I don't want to have their dictating terms that benefit them for some of their failures.

Mr. BILBRAY. Would the gentleman yield?

Mr. HALL. I sure do.

Mr. BILBRAY. That is the reason why I believe in at least having some sunsets down the line to where the burden of proof to be able to continue authorizations in there because then there is a level of comfort that if a mistake is made today, at least we will have within the next few years the ability to go over it again and correct these problems, so it gives more trust at trying new things and moving forward when you know that there is a break that you have got on there and there is a signoff that is in the future. So that level of confidence would be much higher for you that if there is a mistake the sunset allows you to correct it, and I yield back.

Mr. BARTLETT. Mr. Chairman.

Chairman GORDON. Dr. Bartlett is recognized.

Mr. BARTLETT. Let me ask a question. If in fact the authorization expires in 2015, if the Committee did not reauthorize it, have we not sunset the commission?

Chairman GORDON. The commission would not be sunsetted but there would be no funds, money for it, so in effect—

Mr. BARTLETT. So in fact it is sunset?

Chairman GORDON. It is the same effect, yes, sir.

Mr. BARTLETT. Okay. So then since the authorization expires in 2015, we have to look at that time at whether or not we want to continue this commission, do we not?

Chairman GORDON. You are correct.

Mr. BARTLETT. Would that not meet the goal of the amendment and so the amendment then is a perfectly harmless amendment, why not accept it? It doesn't do anything.

Ms. BIGGERT. Will the gentleman yield?

Mr. BARTLETT. I would be happy to.

Ms. BIGGERT. I think that it is not clear because you are talking about going forward with the seven years, the three years, the seven years, et cetera, so it is not clear that you are ending that or sunsetting.

Mr. BARTLETT. Reclaiming my time, I can't understand why—

Chairman GORDON. If I could, I need to, I think, correct my earlier statement. A sunset would make it go away. If the authorization expired, the appropriators could still appropriate money for it. So it is similar but not the same.

Mr. BARTLETT. But if we sunset it, they can appropriate money whether or not, can't they?

Chairman GORDON. I would assume that at that time there would not be a commission.

Mr. BARTLETT. That hasn't stopped them in the past from funding things that we have discontinued. Thank you very much.

Chairman GORDON. Good effort. Okay. Is there any further—

Mr. GRAYSON. Mr. Chairman.

Chairman GORDON. Yes, sir. Mr. Grayson.

Mr. GRAYSON. I just want to say that we would love to have Mr. Hall come back to our party and all is forgiven.

Chairman GORDON. With eight and a half minutes to go, then if there is no further discussion, the vote occurs on the amendment. All in favor say "aye." Opposed, "no." The no's appear to have it. The amendment is not agreed to.

We will—at this time I regret to have to ask you to come back. We have about eight minutes to go on the vote, well, eight official minutes to go on the vote. We have four votes—

Mr. ROHRABACHER. Mr. Chairman, could you give us about 10 minutes extra time to get a sandwich or something?

Chairman GORDON. Well, it was suggested 1:15 but I don't know if we can get those votes done by that time. What about 1:30? And so we will—again, I thank the Committee for being here. We will adjourn until 1:30 at which time we will complete this bill and go into and complete following bill.

[Recess.]

Chairman GORDON. The Committee will come back to order, and Ms. Biggert is not here now, and so Dr. Bartlett has acquiesced to

moving up. Oh. Okay. Here she is then. So, Dr. Bartlett, we will put you back in your normal order.

The fifth amendment on the roster is an amendment offered by the gentlelady from Illinois, Ms. Biggert. Are you ready to proceed with your amendment?

Ms. BIGGERT. I have an amendment at the desk.

Chairman GORDON. The Clerk will report the amendment.

The CLERK. Amendment to H.R. 3585, amendment number 003, offered by Ms. Biggert of Illinois.

Chairman GORDON. I ask unanimous consent to dispense with the reading.

Without objection, so ordered.

Ms. BIGGERT. Thank you.

Chairman GORDON. I recognize the gentlelady for five minutes.

Ms. BIGGERT. Thank you.

Chairman GORDON. Pardon me. Excuse me.

Ms. BIGGERT. Thank you. Mr. Chairman, my amendment would require the Secretary when providing grants to fund demonstration projects for the solar technology to focus on those that provide the greatest potential to reduce energy costs for consumers. Recent reports show that a typical homeowner pays .04 cents to .07 per kilowatt hour for electricity. By contrast, existing solar technology would require a cost of .20 or .25 per kilowatt hour.

So this results in a significant difference in cost for the average consumer. We can support solar technology demonstration and significant investment by including ways to reduce the cost for consumers in our initial research goals.

So my amendment is a common sense one that requires the Secretary to keep the end-user, the consumer, in mind, and I would urge my colleagues to support it and yield back.

[The prepared statement of Ms. Biggert follows:]

PREPARED STATEMENT OF REPRESENTATIVE JUDY BIGGERT

My amendment would require the Secretary, when providing grants to fund demonstration projects for solar technology, to focus on those that provide the greatest potential to reduce energy costs for consumers.

Recent reports show that a typical homeowner, pays $0.04–.07 per kilowatt-hour for electricity.

By contrast, existing solar technology would require a cost of $0.20–.25 per kilowatt-hour.

This results in a significant difference in cost for the average consumer.

We can support solar technology demonstration, and significant investment, by including ways to reduce the costs for consumers in our initial research goals.

My amendment is a common sense one that requires the Secretary to keep the end-user—the consumer—in mind.

I urge my colleagues to support it and yield back.

Chairman GORDON. Does anyone else wish to discuss the amendment?

If not, then Ms. Biggert, thank you for—we—for making us feel better, and we would accept this amendment. Thank you.

Ms. BIGGERT. If the gentleman would yield?

Chairman GORDON. Yes.

Ms. BIGGERT. I would thank you and thank Chairman Giffords for supporting the amendment.

Chairman GORDON. All in favor of the amendment say aye. Opposed, no. The ayes have it, and thank you, Ms. Biggert.

The sixth amendment on the roster is an amendment offered by the gentleman from Maryland, Dr. Bartlett. Are you ready to proceed with your amendment?

Mr. BARTLETT. I have an amendment at the desk.

Chairman GORDON. The Clerk will report the amendment.

The CLERK. Amendment to H.R. 3585, amendment number 016, offered by Mr. Bartlett of Maryland.

Chairman GORDON. I ask unanimous consent to dispense with the reading.

Without objection, so ordered.

I recognize the gentleman for five minutes to explain his amendment.

Mr. BARTLETT. Thank you, Chairman Gordon and Ranking Member Hall. I have worked very closely with Congresswoman Giffords and Committee staff to draft this amendment. It makes two changes in Section 105 concerning demonstration projects.

First, it will strengthen the ability of U.S. companies to regain America's world leadership in solar technology by expanding from at least three to no more than five the number of large demonstration projects over 30 megawatts. It also clarifies that these large projects will be technology neutral.

Second, it will maximize benefits to society and taxpayers from these demonstration projects by adding a requirement to, and I quote, "promote overall electric infrastructure reliability and sustainability should grid functions be disrupted or damaged."

Our grid, while very efficient and cost effective, is also remarkably vulnerable to natural disaster or deliberate attack. Furthermore, the capability of operating independently of the grid to ensure uninterrupted electricity at critical sites and for vital emissions is not incorporated into the present requirements for demonstration projects in Section 105 of H.R. 3585.

This amendment ensures that solar energy technologies will contribute to strengthening our country's economy environment and national security. I appreciate very much the support that I have had for this. Thank you very much and yield back.

[The prepared statement of Mr. Bartlett follows:]

PREPARED STATEMENT OF REPRESENTATIVE ROSCOE BARTLETT

Thank you Chairman Gordon & Ranking Member Hall.

I have worked very closely with Congresswoman Giffords and Committee staff to draft this amendment. It makes two changes in Section 105 concerning demonstration projects.

First, it will strengthen the ability of U.S. companies to regain America's world leadership in solar technology by expanding from at least three to no more than five the number of large demonstration projects over 30 megawatts. It also clarifies that these large projects will be technology neutral.

Second, it will maximize benefits to society and taxpayers from these demonstration projects by adding a requirement to "promote overall electric infrastructure reliability and sustainability should grid functions be disrupted or damaged."

Our grid while very efficient and cost effective is also remarkably vulnerable to natural disaster or deliberate attack. Furthermore, the capability of operating independently of the grid to ensure uninterrupted electricity at critical sites and for vital missions is not incorporated into the present requirements for demonstration projects in Section 105 of H.R. 3585.

This amendment ensures that solar energy technologies will contribute to strengthening our country's economy, environment and national security.

Chairman GORDON. Thank you, Dr. Bartlett. We agree this is an excellent amendment, and again, one more way to make this go better.

If there is no further discussion, all in favor, say aye. Opposed, nay. The ayes have it.

The seventh amendment on the—let us see. Mr. Broun is not here. Let us see if—does anyone want to do his, or should we—or Mr. Bilbray, are you prepared to come up to bat?

Mr. BILBRAY. Yes, Mr. Chairman.

Chairman GORDON. The ninth amendment on the roster is an amendment offered by the gentleman from California, Mr. Bilbray. Are you ready to proceed with your amendment?

Mr. BILBRAY. Yes, Mr. Chairman.

Chairman GORDON. The Clerk will report the amendment.

The CLERK. Amendment to H.R. 3585, amendment number 005, offered by Mr. Bilbray of California.

Mr. BILBRAY. I ask for unanimous consent—

Chairman GORDON. Okay. I ask unanimous consent to dispense with the reading.

Without objection, so ordered.

The gentleman is recognized for five minutes.

Mr. BILBRAY. Thank you, Mr. Chairman, and I don't plan on using the five minutes. I have used enough of your time already today, but as pointed out by the author of the underlying bill, the fact is is that the technology call of solar voltaics who were actually invented here in the United States and sadly the major production of it has gone overseas, a lot of Members may not know that even the basic technology of solar water heating was invented here in the 1880s by a company named Day and Night.

The fact is our technology breakthroughs are so quickly adapted or stolen by other countries, and my amendment just basically tries to protect the proprietary information and trade secrets of the companies that participate in this program. It will just amend page 20, line 15, and specifically identifies the fact that it should include the protection for proprietary information, trade secrets, and other confidential business information.

Very short, very precise but could be very important for our future to make sure that our future breakthroughs stay in the United States as much as possible. And with that I yield back, Mr. Chairman.

Chairman GORDON. Any further discussion?

Mr. ROHRABACHER. Mr. Chairman. Ranking Member Hall.

Chairman GORDON. Well, I was going to say the temporary Ranking Member, Mr. Bilbray.

Mr. BILBRAY. Thank you, Mr. Chairman. I appreciate that.

Chairman GORDON. Rohrabacher. Excuse me.

Mr. ROHRABACHER. Now we have got him right where we want him, totally confused.

Chairman GORDON. They all look the same in California.

Mr. ROHRABACHER. When you got suntan, you just assume you do. Right?

Mr. Chairman, what Mr. Bilbray is bringing up is what I think that—especially those people who are backing this legislation need to look at as an alternative to simply creating new authorities

within the system or just simply spending more money as directed by those people within the governmental system.

There are ways that we—and things we need to do that will facilitate the actual implementation and the development of solar energy in this country without great cost or without taking control of large amounts of revenue and directing them as this whatever elite group decides should be directed.

One we mentioned earlier were tax credits, but another is to pay attention to the intellectual property rights of those people who own the research and have developed the products themselves. We have—there is a piece of legislation making its way through Congress which is supposedly a patent reform bill. Every one of the individual inventors around the country are scared to death of this bill because what it does is empower the big guys to basically take their inventions and thus take away the incentive for people to invest in this very, very solid initial research that comes up with these breakthrough technologies.

So I would suggest that as we move forward in discussion of how to deal with solar energy, how to make sure this technology is brought to pay, that we look at these type of alternatives and think of them as alternatives to what is being proposed, and that is please consider the piece of legislation that is going to be called patent reform when in reality it is what I call steal American technologies act because it will open up theft of the little guys and really—by the way, I have talked to many people in the solar industry who have told me had those rules been in existence that they are trying to now put in place via this new patent bill, they would never have been able to invent the things and develop the solar technologies that they have because they would have been—they have been in production in China before these guys even got their patents.

So with that said, I would—further, I agree with what Mr. Bilbray has been saying and add that to the debate today. Thank you.

Chairman GORDON. Thank you, Mr. Rohrabacher. You are very persuasive. I think this would be a good amendment.

If there is no further discussion, then all in favor say aye. Opposed, nay. The ayes have it. The amendment passes.

We will now go back to the seventh amendment with Mr. Broun. The seventh amendment on the roster is an amendment offered by the gentleman from California, Mr. Broun. Are you ready to proceed with your amendment?

Mr. BROUN. Everybody has—I have enjoyed you, Mr. Chairman.

Chairman GORDON. Oh, I am sorry. I know that.

Mr. BROUN. I don't sound like a Californian.

Chairman GORDON. Southern California.

Mr. BROUN. Yes, Mr. Chairman. I have an amendment at the desk.

Chairman GORDON. The Clerk will report the amendment.

The CLERK. Amendment to H.R. 3585, amendment number 140, offered by Mr. Broun of Georgia.

Chairman GORDON. I ask unanimous consent to dispense with the reading.

Without objection, so ordered.

I recognize the gentleman for five minutes to explain his amendment.

Mr. BROUN. Thank you, Mr. Chairman. I offer this amendment as a way to give the Secretary of Energy some discretion in choosing the best way to allocate funding for research, development, and demonstration of solid technology.

I am concerned that the bill as drafted gives way too much power to the Solar Roadmap Committee that must be comprised of at least one-third of the energy—of the industry. I am not comfortable with requiring that 75 percent of the funding be required to go to activities chosen by such a committee.

This leaves the Secretary with no choices if he feels such activities are inappropriate or if he determines or she determines another technology not considered by the Committee, for whatever reason, should receive more than 25 percent of the funding given to the Department.

My amendment would require the Secretary to devote a percentage of the research chosen by the Committee but would not require it to be a set amount. I feel much more comfortable having the Secretary, who is confirmed by the Senate and has some accountability to the Congress, making the decisions on funding with input from the Roadmap committee, but not being dictated to by it.

Thank you very much for the opportunity to submit this amendment for consideration, Mr. Chairman. I encourage everyone to vote for this common sense amendment to give the Secretary some flexibility and be able to make the choices that he or she needs, whoever that Secretary may be now and in the future, and I yield back the balance of my time.

[The prepared statement of Mr. Broun follows:]

PREPARED STATEMENT OF REPRESENTATIVE PAUL C. BROUN

Mr. Chairman, I offer this amendment as a way to give the Secretary of Energy some discretion in choosing the best way to allocate funding for research, development and demonstration of solar technology.

I am concerned that the bill as drafted gives way too much power to the Solar Roadmap Committee that must be comprised of at least one-third of the industry.

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I feel much more comfortable having the Secretary, who is confirmed by the Senate and has some accountability to the Congress, making the decisions on funding with input from the Roadmap Committee but not being dictated to by it.

Thank you very much for the opportunity to submit this amendment for consideration Mr. Chairman, and I yield back the balance of my time.

Chairman GORDON. Thank you, Mr. Broun.

Ms. Giffords is recognized.

Ms. GIFFORDS. Thank you, Mr. Chairman, Mr. Broun.

I hear your concerns, but I want all the Members on the Committee to know that it is, in fact, the Secretary of the Department of Energy that will be making selection for the Committee Members, so he or she will really have a tremendous amount of discre-

tion about who are going to be the members sitting on the 11-member commission.

I have also heard earlier some concerns about the 75 percent number. As we all know, looking at the bill, it ramps it up. It starts with 30 percent in fiscal year 2012, and culminating in 75 percent in fiscal year 2015, and I understand that 75 percent is a significant majority of the total funding for solar R&D, but, again, looking at the purpose of the bill, what we would do is establish a multi-stakeholder process for creating a long-term plan to direct DOE's efforts for solar R&D development. The resulting plan, or the roadmap, would also be published for everyone to see.

So in terms of transparency and long-term thinking and integration of diverse use, this process would far exceed anything required of EERE today.

What is more, the roadmap idea is not one that has been pulled out of the blue. As I said in my opening statements, this is based after a highly-successful semiconductor technology roadmap. The process has been widely hailed as contributing to a steady and rapid technological advancement in the semiconductor industry.

In contrast, right now R&D funding decisions at EERE are made by a program manager with the support of his or her staff according to whatever rationale he or she sees fit. There is no transparency currently. There is no long-term plan. There is no requirement for consultation with industry or any other stakeholders. It is just a small group of people in an office at the Department of Energy.

I can't understand why Members would object to allocating more funding to the results of a roadmap process rather than the status quo. For anyone concerned with ensuring the wise use of taxpayer dollars, they should take at heart this roadmap process because it is designed to integrate the idea of a wide variety of solar experts from a wide range of perspectives in guiding R&D funding.

The gradual increase in the percentage of required allocation would provide for a smooth transition to the roadmap, and even at the end of the ramp up, fully 25 percent of the R&D budget would still be free to be allocated to projects that fall outside the purview of this multi-stakeholder effort.

Mr. BROUN. Would the gentlelady yield?

Ms. GIFFORDS. Yes, I will yield, Mr. Broun.

Mr. BROUN. While I understand that the Secretary of Energy could nominate whoever he wants to for this committee, and I understand also that a third—up to a half of the Committee members could be out of industry itself. My concern is not so much of—well, it is how this committee is made up but also who makes the decisions.

When the Secretary puts forth the Committee, whatever it might be, there is no maximum number there, that committee could do whatever they want to with 75 percent, and I think it is just—I think everybody needs some accountability and responsibility. And the Energy Secretary is going to be the best way to do that and by reducing the amount and letting the Energy Secretary determine what kind of amount is needed, I think it just improves this bill and allows the flexibility to the Secretary that that Secretary

needs to be able to make sure that the Roadmap Committee doesn't dictate exactly what is going on against what is best policy.

So that is the reason I put forth this amendment, and I think it is a great amendment, and I think it gives the Energy Secretary the flexibility the Secretary needs, I think it is critical for us to not lock the Secretary of Energy into a formula, particularly when the Roadmap Committee is going to dictate 75 percent. So I think the Secretary of Energy should be able to make a whole lot of decisions and the Secretary of Energy could give up to 75 percent if they decided to do so.

So it is not to try to change from the roadmap. My amendment is just to try to give the Secretary of Energy the flexibility that they need, and I yield back.

Ms. GIFFORDS. Mr. Broun, just for your assurance, and I appreciate your concerns, but we have worked extensively with the Department of Energy when crafting this legislation, and they are in support of it.

Also, the—looking at what would be required, the solar roadmap is subject to a comprehensive revision every three years and may be updated annually as needed. So there is going to be a more transparent process with us and Members of Congress to understand again how these decisions are being made and where the funding is going.

So I just would like to assure you. Obviously I don't support your amendment because I don't believe it is the best way to determine the best form of solar policy. I think this is a really integrated plan that will provide for a more focused and targeted approach but also a more comprehensive approach because, again, they can determine if they want to fund small projects, large projects, concentrated solar power, foldable tags, the next type of solar technology that may come. It is fast-changing, it has got some flexibility.

But I think the Secretary of the Department of Energy will have a tremendous amount of say in the process.

Chairman GORDON. The gentlelady's time has expired.

Anyone else wish to make a comment?

Mr. SMITH of Nebraska. Mr. Chairman.

Chairman GORDON. Yes, sir. Mr. Smith is recognized for five minutes.

Mr. SMITH of Nebraska. Yield time to Mr. Broun.

Mr. BROUN. Thank you, Mr. Smith, for yielding time.

There is nothing in this bill that requires transparency. There is nothing that—in this bill that requires open meetings, and so it can be done very secretly, it could be done with no transparency, and the Secretary of Energy, once it is put into place, is going to lose control over 75 percent. I think that is just untenable. It is just something that even though we are going to have the possibility of a revision on a yearly basis or—and it has a three-year period—I think we need to give the Secretary of Energy a whole lot more flexibility.

And I appreciate Ms. Giffords' comments. I really do, and she makes a very good argument, but it is not strong enough to convince me that the Secretary of Energy doesn't need the flexibility that I think that that Secretary should have.

And we don't know who the Secretary of Energy is going to be six months from now. It may be the same one we have today. It may be someone else, and so I think it is critical that we give the Secretary of Energy the flexibility that they need, and that is the reason I offered the amendment, and I encourage others to support it, and I yield back. Thank you, Mr. Smith.

Ms. GIFFORDS. Mr. Broun, you know, would you please yield me some time?

Chairman GORDON. Mr. Smith.

Mr. SMITH OF NEBRASKA. Yes.

Ms. GIFFORDS. I am sorry. Mr. Smith.

If you look at the bill, there actually is quite a bit of transparency. First of all, the bill requires the Department of Energy to study and publish the best practices to improve performance of photovoltaic installations. The study will also examine the effectiveness of federal, State, and local incentives to enhance system performance.

Also, and this was, of course, improved upon by Mr. Bartlett, there are solar projects ranging from one to three megawatts in size, and also projects greater than 30 megawatts in size that are going to be funded, and of course, you know, we are all going to know about those projects and be interested to see where they end up.

The interagency activities identified and recommended from the solar technology roadmap should be coordinated by the Director of OSTP, and again, because this is actually a really transparent process, we will all, unlike with what we currently have with EERE, be very much in the know of the decisions of the roadmap and the Committee members, what they come up with.

This, you know, is precisely why this bill is being brought forward, because we don't have transparency right now, and this is an opportunity for the private sector and the public sector research institutions to all have an important voice in determining what our federal R&D dollars go towards.

Chairman GORDON. Thank you, and if there is no further discussion then——

Mr. HALL. I would like——

Chairman GORDON. Oh. Mr. Hall is recognized.

Mr. HALL. Mr. Chairman, I will just very briefly—of course, I support Dr. Broun's amendment. I don't feel that the Secretary's hands to the roadmap ought to be tied, requiring him to use 75 percent of his appropriated funds. And you know, when they appoint this—into this committee from industry, what is it, 15 percent?

Ms. GIFFORDS. A third.

Mr. HALL. A third. A third. That—is that thirty-three and one-third percent? I am remembering my mathematics background. But you want some, you want good people on that committee, and I want good industry people on the Committee like Rex Tillerson of Exxon or Herm Augustine has been on almost every known and led most of the real studies that have been made by different Presidents, and you want that type person on there.

And if they are on there, it just seems to me that you would be afraid of having people on the Committee that have a self-pro-

moting interest, and if something came up with Lockheed, why probably Augustine would be obligated to take their position and to report it, but still take that position. Or Rex Tillerson or whoever else is running Exxon at that time. Maybe the President might be running it, the government or somebody here. But they ought to have a self-promoting interest and could reward their own failure and then would probably be so required to vote to support whatever position they take.

And I just think decisions about which research activities are funded ought to be left to the Secretary's discretion. These—that advice of industry where they have a financial decision to make, they ought to be watched by someone if the bill itself explicitly exempts them from the *Federal Advisory Committee Act.* I don't know of any major committee that hadn't been guided by that or relegated by that or if they are excluded from that, they had a very definite reason other than that it would slow them down, and that is all I have heard so far.

So what if you have $2.5 billion involved they ought to go a little bit slow, but at this rate I think if you leave it to the Secretary's discretion, it would help some.

Mr. BROUN. Would the gentleman yield?

Mr. HALL. I sure do. I would rather not. Who is asking me? Yeah. Dr. Broun, I do yield to you, sir. I didn't want Ms. Giffords to have to get after me anymore.

Mr. BROUN. Okay. Thank you, Mr. Hall, I appreciate that.

Mr. HALL. I couldn't handle that.

Mr. BROUN. Ms. Giffords, since it is your bill, I am sure I don't have to remind you that the reporting, the dissemination of results that is part of section—of title two is not required under the roadmap part of the bill, so there is in the roadmap portion of the bill there is nothing that will guarantee any transparency or any openness.

And so it is—the reporting is only required under title two of this bill, if I am not mistaken, and so it is—I just want to remind the Committee that there is—that under the roadmap portion there is not reporting necessary, required. There is no transparency required, thus, the only way that we are going to have the transparency, the only way we are going to have the ability to have at least a portion of it being transparent and required on the roadmap portion is by having the Secretary of Energy have the where with all to direct what the Secretary wants to do.

And so it is—I think it is important to not handcuff the Secretary but to allow the Secretary to have some flexibility and give the Secretary the option of giving 75 percent or 100 percent to the recommendations of the Roadmap Committee, but by locking it in with a set formula of 75 percent, then I think we are hamstringing the Secretary, we are hamstringing the American public to have the transparency that they deserve.

And so I think it is important for us to give the Secretary the flexibility. I still hope that folks on your side will see fit to vote for my amendment, and I yield back.

Chairman GORDON. Mr. McCaul is recognized.

Mr. MCCAUL. Thank you, Mr. Chairman. I just had a question of clarification to the author of the bill.

Is this committee subject to the *Freedom of Information Act*?

Ms. GIFFORDS. Yes, it is.

Mr. MCCAUL. Okay. In terms of the transparency, in terms of the meetings that would be subject to the FOI. Okay.

Ms. GIFFORDS. Yes.

Mr. MCCAUL. I yield back. Thanks.

Ms. GIFFORDS. And, Mr. McCaul, if actually you can yield me some of your time and we can hear from staff specifically about the transparency.

Mr. MCCAUL. Yeah. I would be happy to.

COUNSEL. The roadmap needs to be submitted to both Congress and the Secretary of Energy, so it would be submitted publicly, and with that I yield back.

Mr. BROUN. Mr. McCaul, would you yield please?

Mr. MCCAUL. Yes. I yield to Dr. Broun.

Mr. BROUN. Okay. There is no way to know how the decisions are made, what the process was, or anything else, just it is when we go through the *Freedom of Information Act,* which would be the only way to know, we still couldn't get the process revealed. We couldn't get decision-making thoughts revealed to the American public, and, again, we just lock it into 75 percent with this bill the way it is, and so I don't think that is in the best interest of—and the Secretary could decide to give 100 percent of the funds to what the Roadmap Committee recommends. It is all with—if my amendment passes, everything will be at the discretion and only a percentage is required, but that percentage could be set by the Secretary of Energy.

And I just think it makes sense to give the Secretary that kind of flexibility.

Mr. MCCAUL. And I appreciate the gentleman's arguments.

Mr. BROUN. And I yield back.

Mr. MCCAUL. I just wanted the clarification that this is subject to Congressional review and oversight and to the FOI as well, and I think that is the case.

Ms. GIFFORDS. Mr. McCaul, I don't mean to beat a dead horse, but right now the decisions are being made by the EERE, by a program manager with their staff in an office at the DOE with absolutely no requirement for any consultation with the industry, with Congress, with researchers. Right now none of that is happening. It is just a small group of people stuck away at the DOE. I mean, this is a process, a public process, where we are going to have the best and the brightest in the industry, private sector, public sector, universities, and actually have a plan.

So, Mr. Broun, I mean, I understand your concerns, and obviously precisely because we have the same concerns, this is why the roadmap is being created.

Mr. BROUN. Will the gentlelady yield?

Ms. GIFFORDS. It is not my time to yield.

Mr. BROUN. If I could just reclaim my time.

Chairman GORDON. If Mr. McCaul will yield to you.

Mr. MCCAUL. I reclaim my time, and I yield to Dr. Broun.

Mr. BROUN. Thank you, Mr. McCaul.

Mr. MCCAUL. Sure.

Mr. BROUN. I don't think anything should be decided in the dark, and I agree with the gentlelady that we need to make some changes of the process, but—and it is—the process today is flawed, and I congratulate the gentlelady for bringing that forward.

The biggest objection I have is that we don't have a flexibility for the Secretary to be able to look at valid awards that are outside that 25 percent that they will have, and so there may be other things that the Secretary would like to look at but the Roadmap Committee had not recommended. And that is not going to be available under this current bill without my amendment.

My amendment would just give the flexibility to the Secretary, and I think it is critical that the Secretary have that flexibility, and I yield back.

Mr. MCCAUL. Reclaiming my time——

Mr. HALL. Would the gentleman yield to me?

Mr. MCCAUL. I would be happy to yield.

Mr. HALL. That is just like a general indictment of the lack of oversight by Republicans or Democrats. That is the key to it. They are subject to an advisory committee unless they are oversight.

Mr. MCCAUL. Uh-huh. And reclaiming my time, and I know I am out of step with my party on this particular piece of legislation, but I like the idea of the private industry, academia, national labs collaborating together, making these decisions rather than some bureaucrats behind closed doors, you know, in Washington. And I think that is part of this bill that I think is a good feature to it, and with that, Mr. Chairman, I yield back.

Chairman GORDON. Thank you, Mr. McCaul.

If there is no further discussion on the amendment, the vote occurs on the amendment. All in favor, say aye. Opposed, no. The no's have it. The amendment is not agreed to.

The eighth amendment on the roster is an amendment offered by the gentleman from Georgia. Mr. Broun, are you ready to proceed with your amendment?

Mr. BROUN. Yes, I am, Mr. Chairman. I am glad you moved me to my proper place.

Chairman GORDON. I thought you would feel more——

Mr. BROUN. And I know my place around here, too. I have an amendment at the desk, Mr. Chairman.

Chairman GORDON. The Clerk will report the amendment.

The CLERK. Amendment to H.R. 3585, amendment number 141, offered by Mr. Broun of Georgia.

Chairman GORDON. I ask unanimous consent to dispense with the reading.

Without objection, so ordered.

I recognize the gentleman for five minutes to explain the amendment.

Mr. BROUN. Thank you, Mr. Chairman. Again, I would like to thank you for allowing me to submit my amendment for consideration here today.

As my colleagues have already stated, our country is in dire need of a strong and stable domestic energy supply. I have authored and co-sponsored many pieces of legislation designed to do just that. In tearing down the barriers that exist today on new nuclear power sources to allowing for safe and environmental-friendly oil and gas

exploration, to do wind and hydroelectricity projects. We have it in our power to allow our own private industries to solve the problems set before us today.

Mr. Chairman, I believe we should be passing legislation which will encourage innovation and expansion in all of these arenas. The energy solution we are focusing on today is on solar energy and with good reason. As our fellow Committee Members, Ms. Giffords and Mr. Rohrabacher, have often stated, the technological advances in this specific field are almost endless and are growing more numerous by the day.

And they are not only the ones among us who know firsthand about the great potential available in this field. We should be doing all that we can to foster that potential and to scale back the regulatory burdens that exist in our markets to allow easier pathways for private industry to help make that goal a reality.

But we must also recognize one plain and simple fact. We do not currently have enough money to do all of the things that we all would like to do. The goal of energy independence is rightfully centered around getting our country away from its dependence on specific foreign countries who at best have very shaky internal leadership and at worst are outright hostile toward America.

But realizing this noble and vital goal cannot come at the expense of shifting our monetary needs onto still other countries that have proven to be unpredictable towards us in even the most stable of economic times. I think that we can all agree that our current economic situation is far from stable.

So with an eye towards balancing the notable self-interest of energy independence and sustaining a stable monetary system, the amendment I have offered today would freeze the amount authorized in this legislation for the next five years at $200 million each year.

Mr. Chairman, while I am still not certain that there should be a federal role in the expansion of solar energy other than to make it easier for the private sector to do so, I am quite certain that we simply do not have the monetary resources to spend well over $2 billion over the next five years out of the federal treasury, and our children and our grandchildren certainly cannot afford that bill.

I ask my colleagues to understand that our financial resources are not unlimited. We must be responsible with our spending. We must also be aware that the debt we force upon our children and grandchildren, even in the pursuit of noble and Earth-while projects, is still debt.

So I ask my colleagues to support my amendment, which I hope will start us down the co-equal paths of fiscal and energy independence. The amendment reduces it to $200 million in each of the next three years, and I yield back the balance of my time.

[The prepared statement of Mr. Broun follows:]

PREPARED STATEMENT OF REPRESENTATIVE PAUL C. BROUN

Mr. Chairman, again I would like to thank you for allowing me to submit my amendment for consideration here today.

As my colleagues have already stated, our country is in dire need of a strong and stable domestic energy supply.

I have authored and co-sponsored many pieces of legislation designed to do just that.

From tearing down the barriers that exist today on new nuclear power sources, to allowing for safer and environmentally friendly oil and gas exploration, to new wind and hydro-electricity projects, we have it in our power to allow our own private industries to solve the problem set before us.

And Mr. Chairman I believe we should be passing legislation which will encourage innovation and expansion in all of these arenas.

The energy solution we are focusing on today on is Solar Energy, and with good reason.

As our fellow Committee Members, Mrs. Giffords and Mr. Rohrbacher, have often stated, the technological advances in this specific field are almost endless and are growing more numerous by the day.

And they are not the only ones among us who know first hand about the great potential available in this field.

We should be doing all that we can to foster that potential and to scale back the regulatory burdens that exist in our markets to allow easier pathways for private industry to help make that goal a reality.

But we must also recognize one plain and simple fact: we do not currently have enough money to do all of the things that we would like to do.

The goal of energy independence is rightfully centered around getting our country away from its dependence on specific foreign countries who, at best, have very shaky internal leadership and at worst, are outright hostile toward America.

But realizing this noble and vital goal cannot come at the expense of shifting our monetary needs onto still other countries that have proven to be unpredictable towards us in even the most stable of economic times.

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We must be responsible with our spending.

We must also be aware that the debt we force upon our children and grandchildren, even in the pursuit of noble and erstwhile projects, is still debt.

So I ask my colleagues to support my amendment, which I hope will start us down the co-equal paths of energy and fiscal independence.

And I yield back the balance of my time.

Chairman GORDON. Thank you, Mr.—Dr. Broun.

Ms. Giffords is recognized.

Ms. GIFFORDS. Thank you. Dr. Broun, I hear your concerns, but I would just like to remind the Members of the Committee that your amendment would cap the authorization for solar R&D at $200 million per year, which is $50 million less than was authorized in fiscal year 2009, in the *Energy Policy Act of 2005.* Thats bill was, of course, passed by the Republican-led Congress.

I believe the best justification for the proposed authorization levels for this bill comes from taking a historical look at the investment that we have made in energy R&D. Between 1978, and 2005, the United States Government spent $30 billion on R&D for nuclear energy alone. We spent another $24 billion on fossil fuels research. During the same time period we spent less than half—excuse me. We spent less than $6.5 billion on solar energy. More than half of that research was actually performed prior to 1985, which was 25 years ago.

Now, maybe some people think these disperities are appropriate, maybe they think solar does not merit the same level of investment because it is not able to provide as much energy as other technologies, but today that is simply false. Our solar resources are

vast in scale, and they are capable of making a significant contribution to our energy needs.

Using today's technology, solar power could meet the electricity demands of the United States on a square piece of land only 100 by 100 miles, or 10,000 square miles. That is just one-fourth of the land area currently covered by artificial lakes behind hydroelectric dams, which provide less than 10 percent of our nation's electricity.

Scott Stephens, an engineer with the Solar Energy Technology Program at the Department of Energy, recently stated publicly that with the right incentives solar power has the potential to provide 20 percent, again, 20 percent of America's electricity needs by the year 2030. That is equal to the amount of power currently provided by nuclear power plants.

Yet to date we have spent just one-tenth the resources developing solar technologies than we have spent developing nuclear. In the last 30 years we have spent four times more money developing coal technology than solar, and burning coal is a technology that is over 150 years old.

At the end of the term covered in my bill it would authorize $550 million to solar R&D. At the peak of the energy crisis in the 1970s, we spent $3 billion a year on nuclear power development and $1.8 billion on fossil fuels in 2007, dollars.

So as I said before, solar is not a fringe energy. Solar and solar today specifically is really serious. I have spoken many times in this committee about the benefits of solar power: economic growth, good jobs, increased security, and reduced environmental impacts. It is time for our investment in this resource to match the scale of the opportunity before us.

In fiscal year 2011, the solar technology roadmap would authorize $350 million, which is only about 10 percent of today's energy R&D budget. As the solar technology roadmap ramps up, it will allow solar to fulfill its full potential by giving it the funding it needs to become a mature energy technology.

With that I yield back my time.

Mr. BROUN. Would the gentlelady yield?

Ms. GIFFORDS. Yes, Mr. Broun.

Mr. BROUN. Thank you, ma'am. I appreciate, Ms. Giffords.

I am all in favor of solar energy. I really am, and we have seen tremendous strides in that field just through the private sector, and I don't think the Federal Government is the sole arbiter of solar energy or any energy sources. I think the marketplace is going to be the best way to do that, and I want to facilitate the development of all these technologies.

You talk about 100 miles, about 100-mile grid that can provide all the electrical energy, I don't think you want to put that in Arizona, but the—and take up that kind of space there, and I don't think your constituents would either, but the last time that we did an authorization under Republican leadership we were in different economic times than we are today. We are borrowing from our grandchildren's future, and in fact, they are going to live at a lower standard of living today if we don't stop the outrageous spending here in Congress.

I am all for solar energy.

Ms. GIFFORDS. And Mr. Broun——

Mr. BROUN. And when families have economic hard times, they tighten their belts, and they stop spending money. Now——

Ms. GIFFORDS. Mr. Broun——

Mr. BROUN. —my amendment wouldn't——

Ms. GIFFORDS. —I am reclaiming my time

Mr. BROUN. Yes, ma'am. Thank you.

Ms. GIFFORDS. You know, we import over 60 percent of our energy here in the United States right now. About $400 billion. This is the largest transference of wealth. Weaning our dependence off of foreign energy is a national security priority. It is a priority because we are—our growth will continue, our needs for energy will continue, yet without aggressive, smart steps like this solar technology roadmap, we won't get there.

Other countries get it. They are moving forward. We are falling behind. This is a plan to put us on the right path. I am concerned about debt and deficient just like you are, but unless we take some aggressive steps, like actually planning for this new type of energy, we will continue to be left in the dust.

Chairman GORDON. The gentlelady's time has expired, and we have enjoyed the conversation between the gentlelady and Dr. Broun, but if there is no further discussion——

Mr. HALL. I would like to——

Chairman GORDON. Mr. Hall is recognized.

Mr. HALL. I don't even know what I want to say.

Chairman GORDON. Do you want to think about it while we vote here?

Mr. HALL. I would like to brag on the author a little more if I could but—and I want to, and I will.

And we are on a bill here today, all of us are in kind of a bind on this, because we are all pro-solar. We all know we need solar. We know solar could be the answer to every problem we have power wise, and I think I would feel bad if I left here and had voted against the bill, the solar bill. But with this amendment, Mr. Broun, he has given us a little bit of cover there because we can always say, yeah, we voted to knock it down to $600 million.

But that brings me to talking about money, you know. Even in the bailout, you know, the $800 billion, if they had just waited a little bit there and when the President, the new President came in and asked for it and the old President joined him, when Bush and Obama got together, that passed that $800 billion bailout bill. It wouldn't have passed, but they had—they were there then, Mr. Chairman, with $450 billion in FDIC that they could have used, and I happen to know that was their fallback position. They could have used that instead, and they wouldn't have thrown away that $369 billion they threw at AIG.

So you can throw too much money at anything, but we are not without money here, and yes, Madam Author, they did authorize that much money, but they didn't appropriate it. It is just—I don't believe that happened. If it did, somebody—and correct me on it, I am pretty sure it didn't, and that is kind of the way it would happen here, and here we are also getting for this, for solar, they get $200 million for two years from the Stimulus Bill. That is added onto this. The annual current budget gives them a couple hundred million or $250 million per year.

It seems like, you know, it looks like $2.5 billion is just really—and maybe if we are just appropriating and not authorizing it, maybe that is okay. And, you know, I have the problem of asking for a vote on it when we could just vote it out, voice vote it, and everybody can always claim they voted either way, but I am really, I really have a hard time voting against a solar bill, and this is a good solar bill. The only problem I really have with it is the amount, and the amount overshadows so much the fact that I wanted the coverage of the national—of that—what is the name of that? The federal committee to use their regulations, normal regulations you use on something like this.

That is about all I have to say. At least—well, I am not really ready to quit talking. I would hope that we can pass this bill and then we can have some talks with you on down the line on what we are going to do with all this money and how they are going to allocate it and how they are going to report it and maybe get a little more strength in your bill as to the requirements for notice and requirements for hearings and requirements for the public other than just for those folks to be in it.

And to get with my group over here, Leslie Gilbert, Margaret, and these other ladies here that work and advise us, get with them and see if we can't have some—another second look at it before we hit the Floor with it and go to Rules Committee.

Ms. GIFFORDS. Mr. Hall, to your point, obviously authorization is a different process than appropriations. What we are—we are setting the optimal level for the spending, but, of course, the appropriators will then have to step in and make the decisions that they make in their committee.

You know, relative to historical times, and that is why I took the time to lay out how much our investment has been throughout the course of the last 25 years in this country to coal and to nuclear, it is big compared to what we have done historically. But compared to the amount of opportunity for solar energy with today's technology, this amount is actually relatively small.

So, of course, I am always interested in working with you and Members of the Committee to make this bill better. The manager's amendment, as I said earlier, the majority of the changes came from the Minority Members. The Minority Members brought some great amendments today, and we will continue to look forward with you, but I don't want to lose sight of this opportunity, and I want this committee to think big. The opportunities are great for our country, and putting this roadmap in place will be an excellent tool for us to be able to focus our efforts.

Chairman GORDON. The gentleman's time has expired.

Mr. HALL. I yield back. Thank you.

Chairman GORDON. Is there further discussion on the bill? If—Mr. Inglis.

Mr. INGLIS. Just briefly. I want to associate myself with the comments of the Ranking Member. I think that he speaks for many of us in saying that this is a good bill, we liked it before. It is just the money is beyond a level that is probably going to be appropriated.

In fact, not probably, it is beyond the level that is going to be appropriated. In fact, substantially beyond what is going to be ap-

propriated. And so it just—it calls into question why we authorize such a large number and then appropriations is going to come way below that, but meanwhile we went way out there on a very large number, especially with the money in the Stimulus Bill and with the other expenditures.

I think it does make sense to spend that money, a lot of money on solar. It is—and I would disagree with Mr. Broun's comments. Even when the government is in deficit, you would spend money if you were going to make money, and if you got a company that is in financial trouble, you can go borrow money even though you are in big trouble if they think you have got a great idea. You can find lenders who will lend you money to power your way out of your trouble, and that is the situation that the country is in, I think, as to energy.

It makes sense to spend money on energy. The question is whether it makes sense to spend this much money and—or to authorize this much money. And then, of course, as the Ranking Member said, we could just all take solace in the fact that, well, it is not going to be appropriated, so just vote for the thing and then just wait for how much the appropriators knock it down to.

But that gives us a little bit of a feeling of having authorized a huge number when it is not going to be appropriated.

Ms. GIFFORDS. Mr. Inglis, if I may. I just want to again remind everyone that in fiscal year 2011, the solar roadmap calls for $350 million, which is only 10 percent of today's energy R&D budget. So it is a number, but in the big picture it is only 10 percent, and look at the potential that solar energy has for the Nation.

So I want to make sure that you keep that number in perspective. Thank you.

Mr. BROUN. Will the gentleman yield?

Mr. INGLIS. Yes.

Mr. BROUN. I would like to throw in a couple of things.

It goes up about $50 million a year, first thing. Secondly, I don't think that solar research is—has to be necessarily funded by the Federal Government, particularly when the Federal Government is in such great debt. It is important for us to be fiscally responsible and just continue to spend money and spend money and spend money that we do not have even to authorize some money at these huge levels that we do not have.

I for one believe that if we are not energy independent as a Nation, we are not a secure nation. So I agree with Ms. Giffords on that, and I would like to see us energy independent. I would like to see us develop wind and solar and all these alternative energy sources. I would like to see us have greater development and easier permeating for nuclear power, and I have been a very strong advocate for doing so. I would like to see new energy sources developed, and I am a strong advocate for all of those things. It is just that I think authorizing a much less amount of money than what we are authorizing in the bill as it currently is written is being more fiscally responsible and doesn't preclude the private sector from spending whatever they want to spend, and I think we have seen breakthroughs in many areas of science and technology across the spectrum. They have come from the private sector.

Certainly in my business of healthcare and medicine we have seen the private sector develop lots of things. For instance, lasik surgery was never funded by the Federal Government, and the price has been lower because of the marketplace, just as a good example.

So just because we do or don't authorize the amount of money, doesn't make the appropriators appropriate it. They appropriate more than we authorize, and we have seen that in numerous cases, too.

But I think it is just incumbent upon us as Representatives, not rules of the people that are in our District but Representatives of the people in our District and Representatives of our children and grandchildren's future that we need to cut down the amount of money that is being authorized in this bill, and I yield back.

Chairman GORDON. Thank you, Mr. Broun. If there is no further——

Mr. BARTLETT. Mr. Chairman.

Chairman GORDON. Oh, Dr. Bartlett is recognized.

Mr. BARTLETT. Thank you very much. You know, if oil was still $150 a barrel, we wouldn't be here today talking about funding in this bill, because when oil was $150 a barrel, industry was spending plenty of money on alternatives. The problem is that the government did not do the responsible thing, and that is to put a floor under oil. We needed to have told industry that oil will never be less than say $80 a barrel, which I think is a reasonable figure where industry will now invest in alternatives.

We didn't do that, and so now that oil has plummeted down to $60, now $70 a barrel, there just isn't a lot of private capitol out there. I wish we had done the other rather than fund each of these individual bills, because we need to put no public money in this if oil was $150 a barrel. Now, there was plenty incentive for the private sector to invest money, but the government, we in Congress did not do the responsible thing, and that is putting a floor, in effect a floor under oil. Tell industry if it ever drops below a certain value, I am not sure what that value is, but if it ever drops below a certain value, we will make up the difference so you can continue to invest in alternatives because there is going to be a future in alternatives. We didn't do that, and now we are stuck, so here we are.

And I am not sure this is too much money to spend. We face a huge, huge crisis in energy. You don't see it now because the world is in recession, but the sad fact is that never, ever again can the world have sustained good times unless we do something about alternative energy. Because as soon as the economy comes back worldwide, the demand for oil will go up, it will be $150, $200, $250 a barrel, and that will squelch the economy.

So because we didn't do the right thing, now we have to do something which many Members on my side think is the wrong thing to do. But, you know, here we are. We are kind of stuck, and we really do need this alternative energy.

Thank you, and I yield back.

Mr. TONKO. Just quickly.

Chairman GORDON. Thank you, Dr. Bartlett, and Mr. Tonko is recognized.

Mr. TONKO. Yeah. Just quickly, Mr. Chair. I want to commend the sponsor for her legislation. You know, we are challenging each other on this—on the Committee and rightfully so, and our choices that we are acknowledging need to be made. The real choice is are we going to commit our nation to compete with other emerging energy powers in the world?

That is so obvious right now. If we do not commit to winning this green energy race like we did 40 years ago with the space race, we are going to fall behind. We can talk about a safe, secure, sustainable future for our children. But that doesn't happen unless we provide the sort of green energy outcomes that are, you know, fueling the innovation economy in this Nation.

We must emerge from this race as the go-to Nation that will be the exporter of energy intellect, energy innovation. The government has a role to play in that. We have to shave the priciness off of some of the renewables. We have to commit to the most efficient use of dollars in these sciences and technologies that are developed for renewable opportunities.

And so I commend the sponsor, and I think it deserves a supportive vote here.

Chairman GORDON. If there is no further discussion on the bill, the vote occurs on the amendment. All in favor, say aye. Those opposed, no. The no's have it. The amendment is not agreed to.

The Clerk will record, will call the role, please. Record the vote.

The CLERK. Chairman Gordon.

Chairman GORDON. No.

The CLERK. Chairman Gordon votes no. Mr. Costello.

[No response.]

The CLERK. Ms. Johnson.

[No response.]

The CLERK. Ms. Woolsey.

[No response.]

The CLERK. Mr. Wu.

[No response.]

The CLERK. Mr. Baird.

[No response.]

The CLERK. Mr. Miller.

[No response.]

The CLERK. Mr. Lipinski.

Mr. LIPINSKI. No.

The CLERK. Mr. Lipinski votes no. Ms. Giffords.

Ms. GIFFORDS. No.

The CLERK. Ms. Giffords votes no. Ms. Edwards.

[No response.]

The CLERK. Ms. Fudge.

Ms. FUDGE. No.

The CLERK. Ms. Fudge votes no. Mr. Luján.

Mr. LUJÁN. No.

The CLERK. Mr. Luján votes no. Mr. Tonko.

Mr. TONKO. No.

The CLERK. Mr. Tonko votes no. Mr. Griffith.

Mr. GRIFFITH. No.

The CLERK. Mr. Griffith votes no. Mr. Rothman.

[No response.]

The CLERK. Mr. Matheson.
Mr. MATHESON. No.
The CLERK. Mr. Matheson votes no. Mr. Davis.
Mr. DAVIS. No.
The CLERK. Mr. Davis votes no. Mr. Chandler.
Mr. CHANDLER. No.
The CLERK. Mr. Chandler votes no. Mr. Carnahan.
Mr. CARNAHAN. No.
The CLERK. Mr. Carnahan votes no. Mr. Hill.
Mr. HILL. No.
The CLERK. Mr. Hill votes no. Mr. Mitchell.
Mr. MITCHELL. No.
The CLERK. Mr. Mitchell votes no. Mr. Wilson.
Mr. WILSON. No.
The CLERK. Mr. Wilson votes no. Ms. Dahlkemper.
[No response.]
The CLERK. Mr. Grayson.
Mr. GRAYSON. No.
The CLERK. Mr. Grayson votes no. Ms. Kosmas.
Ms. KOSMAS. No.
The CLERK. Ms. Kosmas votes no. Mr. Peters.
[No response.]
The CLERK. Mr. Hall.
Mr. HALL. Aye.
The CLERK. Mr. Hall votes aye. Mr. Sensenbrenner.
[No response.]
The CLERK. Mr. Lamar Smith.
[No response.]
The CLERK. Mr. Rohrabacher.
Mr. ROHRABACHER. Yes.
The CLERK. Mr. Rohrabacher votes aye. Mr. Bartlett.
Mr. BARTLETT. Present.
The CLERK. Mr. Bartlett votes present. Mr. Ehlers.
[No response.]
The CLERK. Mr. Lucas.
[No response.]
The CLERK. Ms. Biggert.
Ms. BIGGERT. Aye.
The CLERK. Ms. Biggert votes aye. Mr. Akin.
[No response.]
The CLERK. Mr. Neugebauer.
[No response.]
The CLERK. Mr. Inglis.
Mr. INGLIS. Aye.
The CLERK. Mr. Inglis votes aye. Mr. McCaul.
Mr. MCCAUL. No.
The CLERK. Mr. McCaul votes no. Mr. Diaz-Balart.
[No response.]
The CLERK. Mr. Bilbray.
[No response.]
The CLERK. Mr. Adrian Smith.
Mr. SMITH OF NEBRASKA. Aye.
The CLERK. Mr. Adrian Smith votes aye. Mr. Broun.
Mr. BROUN. Aye.

The CLERK. Mr. Broun votes aye. Mr. Olson.

[No response.]

Chairman GORDON. How is Mr. Baird recorded?

The CLERK. Mr. Baird is not recorded.

Mr. BAIRD. Mr. Baird votes no.

Chairman GORDON. And how is Mr. Costello recorded?

The CLERK. Mr. Costello is not recorded.

Mr. COSTELLO. No.

The CLERK. Mr. Costello votes no.

Chairman GORDON. Is there anyone else that has not been recorded?

If not, when the tally is made, please report.

The CLERK. Mr. Chairman, six Members vote aye, 19 Members vote no, and one Member votes present.

COMMITTEE ON SCIENCE AND TECHNOLOGY - 111th

DATE 10/7/09 AMENDMENT NO. 141 ROLL CALL NO.___

Bill: H.R. 3585 – the Solar Technology Roadmap Act.

SPONSOR of AMEND – Mr. Broun

PASSED VOICE VOTE
DEFEATED X WITHDRAWN

Quorum – 15 to vote – 22 to report

MEMBER	AYE	NO	PRESENT	NOT VOTING
1 Mr. GORDON, Chair		X		
2 Mr. COSTELLO - *IL*		X		
3 Ms. JOHNSON - *TX*				
4 Ms. WOOLSEY - *CA*				
5 Mr. WU - *OR*				
6 Mr. BAIRD - *WA*		X		
7 Mr. MILLER - *NC*				
8 Mr. LIPINSKI - *IL*		X		
9 Ms. GIFFORDS - *AZ*		X		
10 Ms. EDWARDS - *MD*				
11 Ms. FUDGE - *OH*		X		
12 Mr. LUJÁN - *NM*		X		
13 Mr. TONKO - *NY*		X		
14 Mr. GRIFFITH - *AL*		X		
15 Mr. ROTHMAN - *NJ*				
16 Mr. MATHESON - *UT*		X		
17 Mr. DAVIS - *TN*		X		
18 Mr. CHANDLER - *KY*		X		
19 Mr. CARNAHAN - *MO*		X		
20 Mr. HILL - *IN*		X		
21 Mr. MITCHELL - *AZ*		X		
22 Mr. WILSON - *OH*		X		
23 Mrs. DAHLKEMPER- *PA*				
24 Mr. GRAYSON – *FL*		X		
25 Ms. KOSMAS - *FL*		X		
26 Mr. PETERS - *MI*				
27 Vacancy				

MEMBER	AYE	NO	PRESENT	NOT VOTING
1 Mr. HALL- *TX*	X			
2 Mr. SENSENBRENNER-*WI*				
3 Mr. LAMAR SMITH- *TX*				
4 Mr. ROHRABACHER- *CA*	X			
5 Mr. BARTLETT- *MD*			X	
6 Mr. EHLERS- *MI*				
7 Mr. LUCAS- *OK*				
8 Mrs. BIGGERT- *IL*	X			
9 Mr. AKIN- *MO*				
10 Mr. NEUGEBAUER- *TX*				
11 Mr. INGLIS- *SC*	X			
12 Mr. McCAUL- *TX*		X		
13 Mr. DIAZ-BALART- *FL*				
14 Mr. BILBRAY- *CA*				
15 Mr. ADRIAN SMITH- *NE*	X			
16 Mr. BROUN - *GA*	X			
17 Mr. OLSON- *TX*				
TOTALS	6	19	1	

Mr. Chairman, _____ Members vote Aye and _____ vote No

Chairman GORDON. The no's have it. The amendment is not agreed to.

Are there other amendments?

If no, then the vote is on the bill. H.R. 3585 as amended. All those in favor will say, aye. All those opposed, no. In the opinion of the Chair the ayes have it.

I now recognize—well, I recognize Mr. Tonko for a motion.

Mr. TONKO. Mr. Chair, I move that the Committee favorably report H.R. 3585 as amended to the House with the recommendation that the bill do pass. Furthermore, I move that the staff be instructed to prepare the legislative report and make necessary technical and conforming changes and that the Chair take all necessary steps to bring the bill before the House for consideration.

Chairman GORDON. The question is on the motion to report the bill favorably. Those in favor of the motion will signify by saying, aye. Opposed, no. The ayes have it. The bill is favorably reported.

Without objection, the motion to—okay. Without objection, the motion is reconsidered. It is laid upon the table. Members will have two subsequent calendar days in which to submit supplemental, Minority, or additional views on the measure.

I want to thank the Members for their attendance and the staff on both sides for their good work. This concludes our Committee markup.

[Whereupon, at 3:55 p.m., the Committee was adjourned.]

Appendix:

H.R. 3585 AS AMENDED, AMENDMENT ROSTER

H.R. 3585, AS AMENDED BY THE SUBCOMMITTEE ON ENERGY AND ENVIRONMENT ON SEPTEMBER 30, 2009

1 **SECTION 1. SHORT TITLE.**

2 This Act may be cited as the ''Solar Technology
3 Roadmap Act''.

4 **SEC. 2. DEFINITIONS.**

5 In this Act:

6 (1) SECRETARY.—The term ''Secretary'' means
7 the Secretary of Energy.

8 (2) SOLAR TECHNOLOGY.—The term ''solar
9 technology'' means—

10 (A) photovoltaic technologies, including
11 technologies utilizing—

12 (i) crystalline silicon;

13 (ii) cadmium telluride;

14 (iii) semiconductor materials con-
15 taining copper, indium, and selenium;

16 (iv) thin film silicon;

17 (v) gallium arsenide alloy and multi-
18 junctions;

19 (vi) dye-sensitized and organic solar
20 cell technologies;

(vii) concentrating photovoltaics; and

(viii) other photovoltaic methods identified by the Secretary;

(B) solar thermal electric technology, including linear concentrator systems, dish/engine systems, and power tower systems;

(C) solar thermal water heating technology;

(D) solar heating and air conditioning technologies;

(E) passive solar design in architecture, including both heating and lighting applications; and

(F) related or enabling technologies, including thin films, semiconducting materials, transparent conductors, optics, and technologies that increase durability or decrease cost or weight.

TITLE I—SOLAR TECHNOLOGY RESEARCH, DEVELOPMENT, AND DEMONSTRATION

SEC. 101. PROGRAM.

(a) IN GENERAL.—The Secretary shall conduct a program of research, development, and demonstration for solar technology, including—

1 (1) photovoltaics;
2 (2) solar hot water and solar space heating and
3 cooling;
4 (3) concentrating solar power;
5 (4) lighting systems that integrate sunlight and
6 electrical lighting in complement to each other in
7 common lighting fixtures for the purpose of improv-
8 ing energy efficiency;
9 (5) manufacturability of low cost, high-quality
10 solar energy systems;
11 (6) development of solar technology products
12 that can be easily integrated into new and existing
13 buildings; and
14 (7) other areas as the Secretary considers ap-
15 propriate.
16 (b) AWARDS.—The Secretary shall provide awards
17 under this section on a merit-reviewed, competitive basis
18 to—
19 (1) academic institutions, national laboratories,
20 Federal research agencies, State research agencies,
21 nonprofit organizations, industrial entities, or con-
22 sortia thereof for research, development, and dem-
23 onstration activities; and

1 (2) industry-led consortia for research, develop-
2 ment, and demonstration of advanced techniques for
3 manufacturing a variety of solar energy products.
4 (c) OBJECTIVE.—It is the policy of the United States
5 that at least 75 percent of funding for solar technology
6 research, development, and demonstration activities con-
7 ducted by the Department of Energy after fiscal year
8 2014 support activities identified by and recommended
9 under the Solar Technology Roadmap as described in sec-
10 tion 102.

11 **SEC. 102. SOLAR TECHNOLOGY ROADMAP.**

12 (a) IN GENERAL.—Not later than 18 months after
13 the date of enactment of this Act, the Solar Technology
14 Roadmap Committee established under section 103 shall
15 develop and transmit to the Secretary of Energy and the
16 Congress a Solar Technology Roadmap that—
17 (1) presents the best current estimate of the
18 near-term (up to 2 years), mid-term (up to 7 years),
19 and long-term (up to 15 years) research, develop-
20 ment, and demonstration needs in solar technology;
21 and
22 (2) provides guidance to the solar technology
23 research, development, and demonstration activities
24 supported by the Federal Government for the pur-
25 poses of meeting national priorities in energy secu-

1 rity, United States competitiveness, climate change
2 mitigation, and energy diversification.
3 (b) CONTENTS.—The Solar Technology Roadmap
4 shall—
5 (1) identify research, development, and dem-
6 onstration needs to address—
7 (A) the key solar energy production chal-
8 lenges of intermittency, transience, storage, and
9 scaling, including determining—
10 (i) which solar-related technological
11 solutions are appropriate for various appli-
12 cations, locations, and seasons;
13 (ii) how to store excess solar energy in
14 batteries, supercapacitors, compressed air,
15 flywheels, hydrogen, synthetic fuels, ther-
16 mal storage, or superconductors, or
17 through other means;
18 (iii) how and when to integrate solar
19 energy into the electricity grid effectively,
20 including—
21 (I) the integration of solar tech-
22 nologies with a Smart Grid;
23 (II) electrical power smoothing;
24 (III) microgrid integration;
25 (IV) solar resource forecasting;

(V) long distance transmission; and

(VI) ways to address arbitrage over minutes, hours, days, weeks, and seasons with respect to the full range of project scales; and

(iv) how best to integrate solar technologies into buildings;

(B) modeling and simulation;

(C) the design, materials, and manufacture of solar technologies, as well as related factory sciences;

(D) the development of standards;

(E) the need for demonstration facilities;

(F) optimized packaging methods; and

(G) environmental, safety, and health concerns including reuse, recycling, hazardous materials disposal, and photovoltaic waste issues;

(2) identify opportunities for coordination with partner industries such as those for semiconductors, LED lighting, energy storage, Smart Grid, and wind that can benefit from similar advances;

(3) establish research, development, and demonstration goals with specific timeframes with respect to solar technologies for—

1 (A) improving performance;
2 (B) decreasing cost of electricity generated;
3 (C) improving reliability; and
4 (D) decreasing negative environmental im-
5 pacts and maximizing the environmental bene-
6 fits of solar technologies by examining life-cycle
7 assessments of greenhouse gas emissions, en-
8 ergy payback time, and water usage; and
9 (4) include recommendations, as appropriate, to
10 guide solar technology research, development, and
11 demonstration activities.
12 (c) REVISIONS AND UPDATES.—
13 (1) REVISIONS.—Once every 3 years after com-
14 pletion of the first Solar Technology Roadmap under
15 this Act, the Solar Technology Roadmap Committee
16 shall conduct a comprehensive review and revision of
17 the Solar Technology Roadmap.
18 (2) UPDATES.—The Solar Technology Road-
19 map Committee shall update the Solar Technology
20 Roadmap annually as necessary.
21 **SEC. 103. SOLAR TECHNOLOGY ROADMAP COMMITTEE.**
22 (a) ESTABLISHMENT.—Not later than 4 months after
23 the date of enactment of this Act, the Secretary shall es-
24 tablish, and provide support for as necessary, a Solar
25 Technology Roadmap Committee.

(b) MEMBERSHIP.—

(1) IN GENERAL.—The Solar Technology Roadmap Committee shall consist of at least 11 members. Each member shall be appointed by the Secretary from among subject matter experts representing—

(A) different sectors of the solar technology industry, including manufacturers and equipment suppliers;

(B) national laboratories;

(C) academia;

(D) relevant Federal agencies;

(E) relevant State and local government entities; and

(F) other entities or organizations, as appropriate.

(2) TERMS.—

(A) IN GENERAL.—Except as provided in subparagraph (B), the term of a member of the Solar Technology Roadmap Committee shall be 3 years.

(B) ORIGINAL TERMS.—Of the members appointed originally to the Solar Technology Roadmap Committee, approximately ⅓ shall be appointed for a 2-year term, approximately ⅓ shall be appointed for a 3-year term, and ap-

1 proximately ⅓ shall be appointed for a 4-year
2 term.
3 (3) LIMIT ON TERMS.—A member of the Solar
4 Technology Roadmap Committee may serve more
5 than 1 term, except that such member may not serve
6 a subsequent term unless 2 years have elapsed since
7 the end of a previous term.
8 (4) INDUSTRY PARTICIPATION.—At least ⅓ of
9 the members of the Solar Technology Roadmap
10 Committee shall be individuals described in para-
11 graph (1)(A).
12 (5) CHAIR.—The Secretary shall select a Chair
13 from among the members of the Committee. The
14 Chair shall not be an employee of the Federal Gov-
15 ernment.
16 (c) EXPERT ADVICE.—In developing the Solar Tech-
17 nology Roadmap, the Solar Technology Roadmap Com-
18 mittee may establish subcommittees, working groups com-
19 prised of experts outside the membership of the Solar
20 Technology Roadmap Committee, and other means of
21 gathering expert advice on—
22 (1) particular solar technologies or technological
23 challenges;

1 (2) crosscutting issues or activities relating to
2 more than 1 particular solar technology or techno-
3 logical challenge; or
4 (3) any other area the Solar Technology Road-
5 map Committee considers appropriate.
6 (d) FEDERAL ADVISORY COMMITTEE ACT.—The
7 Federal Advisory Committee Act (5 U.S.C. App.) shall not
8 apply to the Solar Technology Roadmap Committee.

9 **SEC. 104. INTERAGENCY COORDINATION.**

10 The Director of the Office of Science and Technology
11 Policy shall coordinate Federal interagency activities iden-
12 tified in and related to the Solar Technology Roadmap.

13 **SEC. 105. SOLAR TECHNOLOGY DEMONSTRATION**
14 **PROJECTS.**

15 (a) ESTABLISHMENT OF PROGRAM.—The Secretary
16 shall establish a program to provide grants for demonstra-
17 tion projects to support the development of solar energy
18 production, consistent with the Solar Technology Road-
19 map.
20 (b) IMPLEMENTATION.—In carrying out the dem-
21 onstration program under this section, to the extent prac-
22 ticable, the Secretary shall—
23 (1) include at least 10 photovoltaic technology
24 projects that generate between 1 and 3 megawatts;

1 (2) include at least 2 but not more than 3 solar
2 thermal electric technology projects that generate
3 greater than 30 megawatts; and
4 (3) make awards for projects that—
5 (A) are located and can be replicated at a
6 wide range of sites;
7 (B) demonstrate technologies that address
8 intermittency, transience, and storage chal-
9 lenges;
10 (C) facilitate identification of optimum
11 techniques among competing alternatives;
12 (D) include business commercialization
13 plans that have the potential for production of
14 equipment at high volumes;
15 (E) improve United States competitiveness
16 and lead to development of manufacturing tech-
17 nology;
18 (F) demonstrate positive environmental
19 performance through life-cycle analysis; and
20 (G) satisfy other criteria that the Sec-
21 retary considers necessary to carry out the pro-
22 gram.
23 (c) GRANT AWARDS.—Funding provided under this
24 section may be used, to the extent that funding is not oth-

1 erwise available through other Federal programs or power
2 purchase agreements, for—
3 (1) a necessary and appropriate site engineering
4 study;
5 (2) a detailed economic assessment of site-spe-
6 cific conditions;
7 (3) appropriate feasibility studies to determine
8 whether the demonstration can be replicated;
9 (4) installation of equipment, service, and sup-
10 port;
11 (5) operation for a minimum of 3 years and
12 monitoring for the duration of the demonstration;
13 and
14 (6) validation of technical, economic, and envi-
15 ronmental assumptions and documentation of les-
16 sons learned.
17 (d) GRANT SELECTION.—Not later than 90 days
18 after the date of enactment of this Act and annually there-
19 after, the Secretary shall conduct a national solicitation
20 for applications for grants under this section. Grant re-
21 cipients shall be selected on a merit-reviewed, competitive
22 basis. The Secretary shall give preference to proposals
23 that address multiple elements described in subsection (b).
24 (e) LIMITATIONS.—Funding shall not be provided
25 under this section for more than 50 percent of the costs

1 of the project for which assistance is provided. Not more
2 than a total of $300,000,000 shall be provided under this
3 section for the period encompassing fiscal years 2011
4 through 2015.

5 **SEC. 106. PHOTOVOLTAIC PERFORMANCE STUDY.**

6 (a) IN GENERAL.—Not later than one year after the
7 date of enactment of this Act, the Secretary shall transmit
8 to the Congress the results of a study that analyzes the
9 performance of photovoltaic installations in the United
10 States. The study shall assess the current performance of
11 photovoltaic installations and identify opportunities to im-
12 prove the energy productivity of these systems through
13 management, technology, and installation best practices.
14 Such study shall include—

15 (1) identification of the average energy produc-
16 tivity of current commercial and residential installa-
17 tions;

18 (2) assessment of areas where energy produc-
19 tivity is reduced, including wire loss, module mis-
20 match, shading, dust, and other factors;

21 (3) identification of practices and technologies
22 that improve energy productivity;

23 (4) analysis of the potential cost savings and
24 energy productivity gains to the Federal, State, and
25 local governments, utilities, private enterprise, and

1 consumers available through the adoption, installa-
2 tion, and use of high-performance photovoltaic tech-
3 nologies and practices; and
4 (5) an overview of current government incen-
5 tives at the Federal, State, and local levels that en-
6 courage the adoption of highly efficient photovoltaic
7 systems and practices.
8 (b) PUBLIC INPUT.—The Secretary shall ensure that
9 interested stakeholders, including affected industry stake-
10 holders and energy efficiency advocates, have a meaningful
11 opportunity to provide comments, data, and other infor-
12 mation on the scope, contents, and conclusions of the
13 study.
14 **SEC. 107. SOLAR ENERGY PROGRAM REAUTHORIZATION.**
15 (a) IN GENERAL.—There are authorized to be appro-
16 priated to the Secretary to carry out section 101(a)—
17 (1) $350,000,000 for fiscal year 2011;
18 (2) $400,000,000 for fiscal year 2012;
19 (3) $450,000,000 for fiscal year 2013;
20 (4) $500,000,000 for fiscal year 2014; and
21 (5) $550,000,000 for fiscal year 2015.
22 (b) ROADMAP IDENTIFIED ACTIVITIES.—The Sec-
23 retary shall dedicate a percentage of funding received pur-
24 suant to subsection (a) for research, development, and
25 demonstration activities identified by and recommended

1 under the Solar Technology Roadmap in the following per-
2 centages:
3 (1) For fiscal year 2012, at least 30 percent.
4 (2) For fiscal year 2013, at least 45 percent.
5 (3) For fiscal year 2014, at least 60 percent.
6 (4) For fiscal year 2015, at least 75 percent.
7 (c) SOLAR TECHNOLOGY ROADMAP.—The Secretary
8 may use up to $2,000,000 of the funds appropriated pur-
9 suant to subsection (a) for each fiscal year to support the
10 establishment and maintenance of the Solar Technology
11 Roadmap.
12 (d) EXTENSION OF AUTHORIZATIONS.—Of funds au-
13 thorized by subsection (a), there are authorized to be ap-
14 propriated to the Secretary to carry out—
15 (1) section 602 of the Energy Independence
16 and Security Act of 2007 (42 U.S.C. 17171)
17 $12,000,000 for each of the fiscal years 2013
18 through 2015;
19 (2) section 604 of the Energy Independence
20 and Security Act of 2007 (42 U.S.C. 17172)
21 $10,000,000 for each of the fiscal years 2013
22 through 2015;
23 (3) section 605 of the Energy Independence
24 and Security Act of 2007 (42 U.S.C. 17173)

$3,500,000 for each of the fiscal years 2013 through 2015; and

(4) section 606 of the Energy Independence and Security Act of 2007 (42 U.S.C. 17174) $2,500,000 for each of the fiscal years 2013 through 2015.

SEC. 108. EXISTING PROGRAMS.

Except as otherwise specified in this Act, this Act shall supersede any duplicative or conflicting solar research, development, and demonstration programs within the Department of Energy.

SEC. 109. REPEALS.

The following are hereby repealed:

(1) The Solar Energy Research, Development, and Demonstration Act of 1974 (42 U.S.C. 5551 et seq.), except for section 10.

(2) The Solar Photovoltaic Energy Research, Development, and Demonstration Act of 1978 (42 U.S.C. 5581 et seq.).

(3) Section 4(a)(2) and (3) of the Renewable Energy and Energy Efficiency Technology Competitiveness Act of 1989 (42 U.S.C. 12003(a)(2) and (3)).

TITLE II—PHOTOVOLTAIC RECYCLING

SEC. 201. PHOTOVOLTAIC DEVICE RECYCLING RESEARCH, DEVELOPMENT, AND DEMONSTRATION.

(a) DEFINITION.—In this section, the term "photovoltaic device" includes photovoltaic cells and the electronic and electrical components of such devices.

(b) IN GENERAL.—In order to address the issues described in section 102(b)(1)(G), the Secretary shall award multiyear grants for research, development, and demonstration activities to create innovative and practical approaches to increase reuse and recycling of photovoltaic devices and, through such activities, to contribute to the professional development of scientists, engineers, and technicians in the fields of photovoltaic and electronic device manufacturing, design, refurbishing, and recycling. The activities supported under this section shall address—

(1) technology to increase the efficiency of photovoltaic device recycling and maximize the recovery of valuable raw materials for use in new products while minimizing the life-cycle environmental impacts such as greenhouse gas emissions and water usage;

(2) expanded uses for materials from recycled photovoltaic devices;

1 (3) development and demonstration of environ-
2 mentally responsible alternatives to the use of haz-
3 ardous materials in photovoltaic devices and the pro-
4 duction of such devices;
5 (4) development of methods to separate and re-
6 move hazardous materials from photovoltaic devices
7 and to recycle or dispose of those materials in a safe
8 manner;
9 (5) product design and construction to facilitate
10 disassembly and recycling of photovoltaic devices;
11 (6) tools and methods to aid in assessing the
12 environmental impacts of the production of photo-
13 voltaic devices and photovoltaic device recycling and
14 disposal;
15 (7) product design and construction and other
16 tools and techniques to extend the life cycle of pho-
17 tovoltaic devices, including methods to promote their
18 safe reuse;
19 (8) strategies to increase consumer acceptance
20 and practice of recycling of photovoltaic devices; and
21 (9) processes to reduce the costs and environ-
22 mental impact of disposal of toxic materials used in
23 photovoltaic devices.
24 (c) MERIT REVIEW.—Grants shall be awarded under
25 this section on a merit-reviewed, competitive basis.

1 (d) APPLICATIONS.—Each application shall include a
2 description of—
3 (1) the project that will be undertaken and the
4 contributions of each participating entity;
5 (2) the applicability of the project to increasing
6 reuse and recycling of photovoltaic devices with the
7 least environmental impacts as measured by life-
8 cycle analyses, and the potential for incorporating
9 the research results into industry practice; and
10 (3) how the project will promote collaboration
11 among scientists and engineers from different dis-
12 ciplines, such as electrical engineering, materials
13 science, and social science.
14 (e) DISSEMINATION OF RESULTS.—The results of ac-
15 tivities supported under this section shall be made publicly
16 available through—
17 (1) development of best practices or training
18 materials for use in the photovoltaics manufacturing,
19 design, refurbishing, or recycling industries;
20 (2) dissemination at industry conferences;
21 (3) coordination with information dissemination
22 programs relating to recycling of electronic devices
23 in general;
24 (4) demonstration projects; and

1 (5) educational materials for the public pro-
2 duced in conjunction with State and local govern-
3 ments or nonprofit organizations on the problems
4 and solutions related to reuse and recycling of pho-
5 tovoltaic devices.
6 (f) PHOTOVOLTAIC MATERIALS PHYSICAL PROPERTY
7 DATABASE.—
8 (1) IN GENERAL.—The Secretary shall establish
9 an initiative to develop a comprehensive physical
10 property database of materials for use in photo-
11 voltaic devices.
12 (2) PRIORITIES.—The Secretary, working with
13 private industry, shall develop a plan to establish
14 priorities and requirements for the database under
15 this subsection.
16 (3) COORDINATION.—The Secretary shall co-
17 ordinate with the Director of the National Institute
18 of Standards and Technology and the Administrator
19 of the Environmental Protection Agency to facilitate
20 the incorporation of the database under this sub-
21 section with any existing ''green'' database for elec-
22 tronic manufacturing and recycling.

COMMITTEE ON SCIENCE AND TECHNOLOGY
FULL COMMITTEE MARKUP
OCTOBER 7, 2009

AMENDMENT ROSTER

H.R. 3585, the *Solar Technology Roadmap Act*

No.	Sponsor	Description	Results
1	Ms. Giffords (Manager's Amendment) (064)	Makes several technical and clarifying changes to the bill. Amends Section 2 ("Integrating Energy and Water Research") to specify that the Secretary shall ensure that no program or project of DOE is unnecessarily delayed or disrupted in carrying out subsection (a). Amends Section 2 to add two items to the list of specific considerations. Further amends Section 2 to add new subsections on Interagency Collaboration and Nonduplication, Intra-Agency Coordination and Nonduplication, Relevant Information and Recommendations, and Reports.	Agreed to by voice vote.
2	Mr. Peters (018)	Amends Section 101 ("Program") by adding a subsection stating that as a "criteria for providing awards under this Act, the Secretary shall consider areas with high unemployment." Further amends Section 101 by adding a subsection stating that, in carrying out section 105 ("Solar Technology Demonstration Projects"), the Department of Energy "shall strongly consider projects utilizing solar technologies manufactured in the United States."	Agreed to by voice vote.
3	Mr. Luján (028)	Amends Section 102 ("Solar Technology Roadmap") by replacing "long distance transmission" with "long distance transmission options, including direct current and superconducting transmission" as part of the Plan's contents.	Agreed to by voice vote.

4	Ms. Biggert (001)	Strikes the revisions and updates subsection of Section 102 ("Solar Technology Roadmap") and adds a sunset provision stating that the "Solar Technology Roadmap Committee shall cease its activities not later than October 1, 2015."	Defeated by voice vote.
5	Ms. Biggert (003)	Amends Section 105 ("Solar Technology Demonstration Projects") by adding a subsection stating that in carrying out the program, the Secretary shall make awards for projects that "provide the greatest potential to reduce energy costs for consumers..."	Agreed to by voice vote.
6	Mr. Bartlett (016)	Makes several technical and clarifying changes to the bill. Amends Section 105 ("Solar Technology Demonstration Projects") by increasing the number technology projects greater than 30 megawatts to be conducted pursuant to the Section, and makes the demonstration projects technology-neutral. Further amends Section 105 by adding a subsection stating that in carrying out the program, the Secretary shall make awards for projects that "promote overall electric infrastructure reliability and sustainability should grid functions be disrupted or damaged..."	Agreed to by voice vote.
7	Mr. Bilbray (005)	Amends Section 201 ("Photovoltaic Device Recycling Research, Development, and Demonstration") to add a requirement that the Secretary's plan to establish priorities and requirements for the Photovoltaic Materials Physical Property database include "the protection of proprietary information, trade secrets, and other confidential business information."	Agreed to by voice vote.
8	Mr. Broun (140)	Amends Section 101 ("Program") provision which states that it is the "policy of the United States that at least 75 percent of funding for solar technology research, development, and demonstration activities conducted by the Department of Energy after fiscal year 2014 support activities	Defeated by voice vote.

		identified by and recommended under the Solar Technology Roadmap…" by replacing "at least 75 percent" with "a percentage." Amends Section 107 ("Solar Energy Program Reauthorization") by eliminating the requirement that the following percentages of funds for research, development, and demonstration activities be dedicated to activities identified by the Solar Technology Roadmap: (1) at least 30 percent for fiscal year 2012; (2) at least 45 percent for fiscal year 2013; (3) at least 60 percent for fiscal year 2014; (4) at least 75 percent for fiscal year 2015.	
9	Mr. Broun (141)	Amends Section 107 ("Solar Energy Program Reauthorization") by striking the authorization amounts for fiscal years 2011 through 2015 and reducing them to $200,000,000 for each of the fiscal years 2011 through 2013.	Defeated by roll call vote: Y-6 N-19 Present-1

AMENDMENT TO H.R. 3585
OFFERED BY MS. GIFFORDS OF ARIZONA

Page 3, line 17, insert ''to promote a diversity of research, development, and demonstration activities for solar technology'' after ''under this section''.

Page 3, line 21, insert ''research'' after ''nonprofit''.

Page 4, line 4, strike ''(c) OBJECTIVE.—It is the policy of the United States'' and insert ''(c) SENSE OF CONGRESS.—It is the sense of Congress''.

Page 4, line 8, insert ''a diversity of'' after ''2014 support''.

Page 5, lines 1 and 2, strike ''climate change mitigation'' and insert ''mitigation of adverse environmental impacts''.

Page 5, line 6, insert ''for a diversity of solar technologies'' after ''demonstration needs''.

Page 6, line 15, strike ''and''.

Page 6, line 18, strike the semicolon and insert ''; and''.

Page 6, after line 18, insert the following new subparagraph:

1 (H) other areas identified by the Sec-
2 retary;

Page 6, line 21, strike "LED".

Page 6, line 24, strike "specific" and insert "recommended".

Page 7, line 4, insert "potential" after "decreasing".

Page 7, lines 6 through 8, strike "by examining" and all that follows through "water usage; and" and insert a semicolon.

Page 7, line 11, strike the period and insert "; and".

Page 7, after line 11, insert the following new paragraph:

3 (5) outline the various technologies and prac-
4 tices considered by the Committee and the benefits
5 and shortcomings of each, as appropriate.

Page 8, line 13, strike "and".

Page 8, line 14, redesignate subparagraph (F) as subparagraph (G).

Page 8, after line 13, insert the following new subparagraph:

1 (F) private research institutions; and

Page 9, line 8, insert "and not more than 1/2" after "at least 1/3".

Page 9, after line 15, insert the following new paragraph:

2 (6) CONFLICTS OF INTEREST.—The Secretary,
3 in appointing members to the Committee, shall make
4 every effort to ensure that—
5 (A) no individual appointed to serve on the
6 Committee has a conflict of interest that is rel-
7 evant to the functions to be performed, unless
8 such conflict is promptly and publicly disclosed
9 and the Secretary determines that a waiver is
10 appropriate;
11 (B) the Committee membership is fairly
12 balanced as determined by the Secretary to be
13 appropriate for the functions to be performed;
14 and
15 (C) the final report of the Committee will
16 be the result of the Committee's independent
17 judgment.

1 The Secretary shall require that individuals that are
2 appointed or intended to be to appointed to serve on
3 the Committee inform the Department of Energy of
4 any individual's conflicts of interest that are relevant
5 to the functions to be performed.

Page 10, line 6, redesignate subsection (d) as subsection (e).

Page 10, after line 5, insert the following new subsection:

6 (d) COMPENSATION AND EXPENSES.—A member of
7 the Solar Technology Roadmap Committee shall not be
8 compensated for service on the Committee, but may be
9 allowed travel expenses, including per diem in lieu of sub-
10 sistence, in accordance with subchapter I of chapter 57
11 of title 5, United States Code.

Page 10, line 11, insert ''review and'' after ''Policy shall''.

Page 10, line 12, insert ''as appropriate'' after ''Technology Roadmap''.

Page 10, line 19, insert ''as available'' after ''Technology Roadmap''.

Page 13, line 8, insert ''and the Solar Technology Roadmap Committee'' after ''to the Congress''.

Page 13, lines 12 and 13, strike ''through management, technology, and installation best practices''.

Page 13, line 21, strike ''practices and technologies'' and insert ''technology development and technical standards''.

Page 14, line 13, insert ''All forums for the Department to receive this input from interested stakeholders shall be announced in the Federal Register.'' after ''of the study.''.

Page 16, line 9, strike ''or conflicting''.

Page 20, line 3, insert ''research'' after ''or nonprofit''.

Page 20, line 9, strike ''an initiative to develop''.

Page 20, line 11, after ''photovoltaic devices.'' insert ''This database shall include—

1 (A) identification of materials used in pho-
2 tovoltaic devices;
3 (B) a list of commercially available
4 amounts of these materials;
5 (C) amounts of these materials projected
6 to be available through mining or recycling of
7 photovoltaic and other electronic devices; and

1 (D) a list of other significant uses for each
2 of these materials.''.

Page 20, line 21, strike '' 'green' ''.

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AMENDMENT TO H.R. 3585

OFFERED BY MR. PETERS OF MICHIGAN

Page 4, after line 10, insert the following new subsections:

1 (d) SPECIAL CONSIDERATION.—As a criteria for pro-
2 viding awards under this Act, the Secretary shall consider
3 areas with high unemployment.
4 (e) COMPETITIVENESS.—In carrying out section 105,
5 the Department of Energy shall strongly consider projects
6 utilizing solar technologies manufactured in the United
7 States.

Page 8, line 6, insert "domestic" after "sectors of the".

AMENDMENT TO H.R. 3585
OFFERED BY MR. LUJÁN OF NEW MEXICO

Page 6, line 1, strike ''long distance transmission'' and insert ''long distance transmission options, including direct current and superconducting transmission''.

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AMENDMENT TO H.R. 3585

OFFERED BY Mrs. Biggert (IL)

Page 7, lines 12 through 20, strike subsection (c)

Page 10, after line 8, insert the following new subsection:

1 (e) SUNSET.—The Solar Technology Roadmap Com-
2 mittee shall cease its activities not later than October 1,
3 2015.

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AMENDMENT TO H.R. 3585

OFFERED BY Mrs. Biggert (IL)

Page 11, line 19, strike "and"

Page 11, after line 19, insert the following new subgraph (and redesignate the subsequent subparagraph rdingly):

(G) provide the greatest potential to reduce energy costs for consumers; and

AMENDMENT TO H.R. 3585

OFFERED BY MR. BARTLETT OF MARYLAND

Page 11, lines 1 and 2, strike "2 but not more than 3 solar thermal electric" and insert "3 but not more than 5 solar".

Page 11, after line 6, insert the following new subparagraph (and redesignate the subsequent subparagraphs accordingly):

1 (B) are located and can be replicated in a
2 variety of regions and climates;

Page 11, lines 8 and 9, strike "and storage challenges" and insert "storage challenges, and independent operational capability".

Page 11, line 19, strike "and".

Page 11, after line 19, insert the following new subparagraph (and redesignate the subsequent subparagraph accordingly):

3 (H) promote overall electric infrastructure
4 reliability and sustainability should grid func-
5 tions be disrupted or damaged; and

AMENDMENT TO H.R. 3585

OFFERED BY MR. BROUN OF GEORGIA

Page 4, line 5, strike "at least 75 percent" and insert "a percentage".

Page 15, lines 1 through 6, strike "in the following" and all that follows through "75 percent".

☒

AMENDMENT TO H.R. 3585
OFFERED BY MR. BROUN OF GEORGIA

Page 14, lines 16 through 21, strike "section 101(a)" and all that follows through "2015" and insert "section 101(a) $200,000,000 for each of the fiscal years 2011 through 2013".

AMENDMENT TO H.R. 3585

OFFERED BY Mr. Bilbray

Page 20, line 15, insert ", including the protection of proprietary information, trade secrets, and other confidential business information" after "under this subsection".

XIII. Additional Views

ADDITIONAL VIEWS

As a conference, we are supportive of solar energy and have so voted. We certainly see the great potential it has to be a contributor of energy to our constituents. However we do have some concerns with the large authorization in this bill and the requirement of funds to be directed to the roadmap recommendations.

First, the bill authorizes $2.25 billion over five years. This is not an insignificant amount—especially in our current financial climate. The question was raised whether or not investment tax credits for solar energy, long-term incentives to develop renewable energy in general, or an easing of burdensome regulations would be a better way to encourage the development and use of solar energy. Solar energy has been "on the forefront" for over thirty years and it still only makes up 1% of the 7% of the renewable energy consumed in the U.S. according to the Energy Information Administration. This authorization, coupled with the requirement that the Secretary of Energy (Secretary) allocate at least 75% of funding to those solar research, development, and demonstration projects directed under the Roadmap, leaves little flexibility for innovations that may be viable and yet not included as part of the Roadmap.

Second, the bill directs the Secretary to spend a minimum increasing amount (starting with at least 30% in 2012 and culminating with at least 75% in 2015) with no maximum limit of the authorization on the research, development and demonstration (RD&D) set forth by the Roadmap Committee. At least one third of the Committee is made up of industry officials who are explicitly exempted from the Federal Advisory Committee Act, which is intended to provide an open and transparent process. While we support the Department of Energy, university, and industry collaboration in the area of solar research, development and demonstration, the optics of this exemption are that you now have a Committee, half of whose membership could be industry, telling the Department of Energy (DOE) where to direct taxpayer money into RD&D that could benefit their companies while not having to answer to anyone or defend their recommendations. We do appreciate the inclusion, at our suggestion, of language dealing with potential conflicts of interest in regard to Roadmap Committee membership, as well as the other suggestions we made that were included in the Manager's Amendment.

During the markup, we attempted to address our concerns through amendments that would have reduced the authorization, given the Secretary of DOE discretion as to how much funding should go to the Roadmap recommendations, and sunset the Roadmap Committee in 2015. These amendments were all voted down.

We are hopeful that these concerns can be addressed should we move to a conference with the Senate.

RALPH HALL.
JAMES SENSENBRENNER.
BRIAN BILBRAY.
DANA ROHRABACHER.
VERNON EHLERS.
FRANK D. LUCAS.
JUDY BIGGERT.
BOB INGLIS.
MARIO DIAZ-BALART.
PAUL BROUN.
PETE OLSON.
ADRIAN SMITH.
LAMAR SMITH.

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