111TH CONGRESS
2D SESSION

H. R. 5116

AN ACT

To invest in innovation through research and development, to improve the competitiveness of the United States, 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; TABLE OF CONTENTS.

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

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

TITLE I—SCIENCE AND TECHNOLOGY POLICY

Subtitle A—National Nanotechnology Initiative Amendments

SEC. 101. SHORT TITLE.

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

SEC. 102. NATIONAL NANOTECHNOLOGY PROGRAM AMENDMENTS.

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

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

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

sessing progress toward the objectives, and that describes—

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

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

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

(2) in section 2—

(A) in subsection (d)—

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

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

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

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

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

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

''(b) FUNDING.—(1) The operation of the National Nanotechnology Coordination Office shall be supported by funds from each agency participating in the Program. The portion of such Office's total budget provided by each agency for each fiscal year shall be in the same proportion as the agency's share of the total budget for the Program for the previous fiscal year, as specified in the report required under section 2(d)(1).

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

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

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

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

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

''(d) PUBLIC INFORMATION.—(1) The National Nanotechnology Coordination Office shall develop and maintain a database accessible by the public of projects funded under the Environmental, Health, and Safety, the Education and Societal Dimensions, and the Nanomanufacturing program component areas, or any successor pro-

gram component areas, including a description of each project, its source of funding by agency, and its funding history. For the Environmental, Health, and Safety program component area, or any successor program component area, projects shall be grouped by major objective as defined by the research plan required under section 103(b) of the National Nanotechnology Initiative Amendments Act of 2010. For the Education and Societal Dimensions program component area, or any successor program component area, the projects shall be grouped in subcategories of—

''(A) education in formal settings;

''(B) education in informal settings;

''(C) public outreach; and

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

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

use at the facility, and a description of the technical support available to assist users of the facility.'';

(5) in section 4(a)—

(A) by striking ''or designate'';

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

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

(6) in section 4(b)—

(A) by striking ''or designated'' and ''or designating''; and

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

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

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

''(a) IN GENERAL.—The Director of the National Nanotechnology Coordination Office shall enter into an arrangement with the National Research Council of the National Academy of Sciences to conduct a triennial review

of the Program. The Director shall ensure that the arrangement with the National Research Council is concluded in order to allow sufficient time for the reporting requirements of subsection (b) to be satisfied. Each triennial review shall include an evaluation of the—

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

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

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

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

''(b) EVALUATION TO BE TRANSMITTED TO CONGRESS.—The National Research Council shall document the results of each triennial review carried out in accordance with subsection (a) in a report that includes any recommendations for ways to improve the Program's man-

agement and coordination processes and for changes to the Program's objectives, funding priorities, and technical content. Each report shall be submitted to the Director of the National Nanotechnology Coordination Office, who shall transmit it to the Advisory Panel, the Committee on Commerce, Science, and Transportation of the Senate, and the Committee on Science and Technology of the House of Representatives not later than September 30 of every third year, with the first report due September 30, 2010.

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

''(1) $500,000 for fiscal year 2010.

''(2) $500,000 for fiscal year 2011.

''(3) $500,000 for fiscal year 2012.''; and

(8) in section 10—

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

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

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

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

SEC. 103. SOCIETAL DIMENSIONS OF NANOTECHNOLOGY.

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

(1) ensuring that a research plan for the environmental, health, and safety research activities re-

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

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

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

(b) RESEARCH PLAN.—

(1) IN GENERAL.—The Coordinator for Societal Dimensions of Nanotechnology shall convene and

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

(c) NANOTECHNOLOGY PARTNERSHIPS.—

(1) ESTABLISHMENT.—As part of the program authorized by section 9 of the National Science Foundation Authorization Act of 2002, the Director

of the National Science Foundation shall provide 1 or more grants to establish partnerships as defined by subsection (a)(2) of that section, except that each such partnership shall include 1 or more businesses engaged in the production of nanoscale materials, products, or devices. Partnerships established in accordance with this subsection shall be designated as ''Nanotechnology Education Partnerships''.

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

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

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

possibilities in nanotechnology as scientists, engineers, and technicians; and

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

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

(d) UNDERGRADUATE EDUCATION PROGRAMS.—

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

(A) development of courses of instruction or modules to existing courses;

(B) faculty professional development; and

(C) acquisition of equipment and instrumentation suitable for undergraduate education and research in nanotechnology.

(2) COURSE, CURRICULUM, AND LABORATORY IMPROVEMENT AUTHORIZATION.—There are authorized to be appropriated to the Director of the National Science Foundation to carry out activities described in paragraph (1) through the Course, Curriculum, and Laboratory Improvement program from amounts authorized under section 7002(c)(2)(B) of the America COMPETES Act, $5,000,000 for fiscal year 2010.

(3) ADVANCED TECHNOLOGY EDUCATION AUTHORIZATION.—There are authorized to be appropriated to the Director of the National Science Foundation to carry out activities described in paragraph (1) through the Advanced Technology Education program from amounts authorized under section 7002(c)(2)(B) of the America COMPETES Act, $5,000,000 for fiscal year 2010.

(e) INTERAGENCY WORKING GROUP.—The National Science and Technology Council shall establish under the Nanoscale Science, Engineering, and Technology Subcommittee an Education Working Group to coordinate,

prioritize, and plan the educational activities supported under the Program.

(f) SOCIETAL DIMENSIONS IN NANOTECHNOLOGY EDUCATION ACTIVITIES.—Activities supported under the Education and Societal Dimensions program component area, or any successor program component area, that involve informal, precollege, or undergraduate nanotechnology education shall include education regarding the environmental, health and safety, and other societal aspects of nanotechnology.

(g) REMOTE ACCESS TO NANOTECHNOLOGY FACILITIES.—(1) Agencies supporting nanotechnology research facilities as part of the Program shall require the entities that operate such facilities to allow access via the Internet, and support the costs associated with the provision of such access, by secondary school students and teachers, to instruments and equipment within such facilities for educational purposes. The agencies may waive this requirement for cases when particular facilities would be inappropriate for educational purposes or the costs for providing such access would be prohibitive.

(2) The agencies identified in paragraph (1) shall require the entities that operate such nanotechnology research facilities to establish and publish procedures, guidelines, and conditions for the submission and approval of

applications for the use of the facilities for the purpose identified in paragraph (1) and shall authorize personnel who operate the facilities to provide necessary technical support to students and teachers.

SEC. 104. TECHNOLOGY TRANSFER.

(a) PROTOTYPING.—

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

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

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

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

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

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

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

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

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

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

(b) USE OF EXISTING TECHNOLOGY TRANSFER PROGRAMS.—

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

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

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

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

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

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

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

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

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

(2) NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY.—The Director of the National Institute of Standards and Technology in carrying out the requirements of section 28 of the National Insti-

tute of Standards and Technology Act (15 U.S.C. 278n) shall—

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

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

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

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

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

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

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

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

SEC. 105. RESEARCH IN AREAS OF NATIONAL IMPORTANCE.

(a) IN GENERAL.—The Program shall include support for nanotechnology research and development activities directed toward application areas that have the potential for significant contributions to national economic competitiveness and for other significant societal benefits. The activities supported shall be designed to advance the development of research discoveries by demonstrating technical solutions to important problems in such areas as nanoelectronics, energy efficiency, health care, and water remediation and purification. The Advisory Panel shall make recommendations to the Program for candidate research and development areas for support under this section.

(b) CHARACTERISTICS.—

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

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

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

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

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

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

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

(c) REPORT.—Reports required under section 2(d) of the 21st Century Nanotechnology Research and Develop-

ment Act (15 U.S.C. 7501(d)) shall include a description of research and development areas supported in accordance with this section, including the same budget information as is required for program component areas under paragraphs (1) and (2) of such section 2(d).

SEC. 106. NANOMANUFACTURING RESEARCH.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

(i) to meet current and near-term requirements for the fabrication and charac-

terization of nanoscale devices and systems; and

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

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

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

(ii) the operation and maintenance of such facilities.

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

(3) REPORT.—Not later than 18 months after the date of enactment of this Act, the Advisory Panel shall submit to the Committee on Commerce, Science, and Transportation of the Senate and the Committee on Science and Technology of the House

of Representatives a report on its assessment required under paragraph (2), along with any recommendations and a copy of the report prepared in accordance with paragraph (1).

SEC. 107. DEFINITIONS.

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

Subtitle B—Networking and Information Technology Research and Development

SEC. 111. SHORT TITLE.

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

SEC. 112. PROGRAM PLANNING AND COORDINATION.

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

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

''(1) periodically assess the contents and funding levels of the Program Component Areas and re-

structure the Program when warranted, taking into consideration any relevant recommendations of the advisory committee established under subsection (b); and

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

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

''(e) STRATEGIC PLAN.—

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

''(2) CONTENTS.—The strategic plan shall specify near-term and long-term objectives for the

Program, the anticipated time frame for achieving the near-term objectives, the metrics to be used for assessing progress toward the objectives, and how the Program will—

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

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

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

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

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

''(F) attract more women and underrepresented minorities to pursue postsecondary degrees in networking and information technology.

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

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

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

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

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

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

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

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

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

(d) ADVISORY COMMITTEE.—Section 101(b)(1) of such Act (15 U.S.C. 5511(b)(1)) is amended by inserting

after ''an advisory committee on high-performance computing,'' the following: ''in which the co-chairs shall be members of the President's Council of Advisors on Science and Technology and with the remainder of the committee''.

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

(1) in subparagraph (C)—

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

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

(2) in subparagraph (D)—

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

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

(C) by striking ''and'' after the semicolon;

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

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

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

''(F) include—

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

''(b) CHARACTERISTICS.—

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

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

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

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

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

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

''(3) AGENCY COLLABORATION.—If 2 or more agencies identified in section 101(a)(3)(B), or other

appropriate agencies, are working on large-scale research and development activities in the same area of national importance, then such agencies shall strive to collaborate through joint solicitation and selection of applications for support and subsequent funding of projects.

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

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

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

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

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

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

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

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

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

''SEC. 105. UNIVERSITY/INDUSTRY TASK FORCE.

''(a) ESTABLISHMENT.—Not later than 180 days after the date of enactment of the Networking and Information Technology Research and Development Act of 2010, the Director of the National Coordination Office established under section 102 shall convene a task force to explore mechanisms for carrying out collaborative research and development activities for cyber-physical systems, in-

cluding the related technologies required to enable these systems, through a consortium or other appropriate entity with participants from institutions of higher education, Federal laboratories, and industry.

''(b) FUNCTIONS.—The task force shall—

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

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

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

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

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

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

''(d) REPORT.—Not later than 1 year after the date of enactment of the Networking and Information Technology Research and Development Act of 2010, the Director of the National Coordination Office shall transmit to the Committee on Commerce, Science, and Transportation of the Senate and the Committee on Science and Technology of the House of Representatives a report describing the findings and recommendations of the task force.''.

SEC. 115. NATIONAL COORDINATION OFFICE.

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

''SEC. 102. NATIONAL COORDINATION OFFICE.

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

''(b) FUNCTIONS.—The National Coordination Office shall—

''(1) provide technical and administrative support to—

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

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

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

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

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

''(5) promote access to and early application of the technologies, innovations, and expertise derived

from Program activities to agency missions and systems across the Federal Government and to United States industry.

''(c) SOURCE OF FUNDING.—

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

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

SEC. 116. IMPROVING NETWORKING AND INFORMATION TECHNOLOGY EDUCATION.

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

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

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

''(2) the National Science Foundation shall use its existing programs, in collaboration with other

agencies, as appropriate, to improve the teaching and learning of networking and information technology at all levels of education and to increase participation in networking and information technology fields, including by women and underrepresented minorities;''.

SEC. 117. CONFORMING AND TECHNICAL AMENDMENTS.

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

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

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

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

(4) in paragraph (2)—

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

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

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

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

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

(2) in subsection (a)—

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

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

(i) in the matter preceding subparagraph (A), by striking ''National High-Performance Computing Program'' and inserting ''networking and information tech-

nology research and development program'';

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

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

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

(i) in subparagraphs (A) and (C)—

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

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

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

(3) in subsection (b)(1), in the matter preceding subparagraph (A), by striking ''high-perform-

ance computing'' both places it appears and inserting ''networking and information technology''; and

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

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

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

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

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

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

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

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

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

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

(1) in the section heading, by striking ''**HIGH-PERFORMANCE COMPUTING**'' and inserting ''**NETWORKING AND INFORMATION TECHNOLOGY**''; and

(2) in subsection (a)—

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

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

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

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

Subtitle C—Other OSTP Provisions

SEC. 121. FEDERAL SCIENTIFIC COLLECTIONS.

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

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

(c) CLEARINGHOUSE.—The Office of Science and Technology Policy, in consultation with relevant Federal agencies, shall ensure the development of an online clear-

inghouse for information on the contents of and access to Federal scientific collections.

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

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

(A) conduct a review of the research value of the collection; and

(B) consult with researchers who have used the collection, and other potentially interested parties, concerning—

(i) the collection's value for research purposes; and

(ii) possible additional educational uses for the collection; and

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

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

SEC. 122. COORDINATION OF MANUFACTURING RESEARCH AND DEVELOPMENT.

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

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

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

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

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

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

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

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

(D) describe how the Federal agencies supporting manufacturing research and development will strengthen all levels of manufacturing education and training programs to ensure an adequate, well-trained workforce.

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

(d) REPORT TO CONGRESS.—Not later than 1 year after the date of enactment of this Act, the Director of

the Office of Science and Technology Policy shall transmit the strategic plan developed under subsection (b)(3) to the Committee on Commerce, Science, and Transportation of the Senate, and the Committee on Science and Technology of the House of Representatives, and shall transmit subsequent updates to those committees when completed.

SEC. 123. INTERAGENCY PUBLIC ACCESS COMMITTEE.

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

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

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

consensus standards, including international standards;

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

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

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

(5) establish priorities for coordinating the development of any Federal science agency policies related to public access to the results of federally funded research to maximize uniformity of such policies with respect to their benefit to, and potential

economic or other impact on, the science and engineering enterprise and the stakeholders thereof.

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

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

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

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

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

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

(f) SENSE OF CONGRESS REGARDING PEER REVIEW.—It is the sense of Congress that peer review is an important part of the process of ensuring the integrity of

the record of scientific research, and that the National Science and Technology Council working group established under this section should take into account the role that scientific publishers play in the peer review process.

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

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

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

(1) IN GENERAL.—Not later than 6 months after the date of enactment of this Act, the Director of the Office of Science and Technology Policy shall develop a uniform policy for all Federal science agencies to carry out a program of workshops that educate program officers, members of grant review panels, institution of higher education STEM department chairs, and other federally funded researchers about methods that minimize the effects of gender bias in evaluation of Federal research grants and in the related academic advancement of actual

and potential recipients of these grants, including hiring, tenure, promotion, and selection for any honor based in part on the recipient's research record.

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

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

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

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

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

(A) Invitees to workshops shall include at least—

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

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

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

of an institution of higher education department chair; and

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

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

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

(D) Workshop programs shall include information on best practices and the value of

mentoring undergraduate and graduate women students as well as outreach to girls earlier in their STEM education.

(5) REPORT.—

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

(2) REPORTING OF DATA.—

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

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

(C) The National Science Foundation shall be responsible for storing and publishing all of the grant data submitted under subparagraph (B), disaggregated and cross-tabulated by race, ethnicity, and gender, in conjunction with the biennial report required under section 37 of the

Science and Engineering Equal Opportunities Act (42 U.S.C. 1885d).

SEC. 125. NATIONAL COMPETITIVENESS AND INNOVATION STRATEGY.

Not later than one year after the date of the enactment of this Act, the Director of the White House Office of Science and Technology Policy shall submit to Congress and the President a national competitiveness and innovation strategy for strengthening the innovative and competitive capacity of the Federal Government, State and local governments, institutions of higher education, and the private sector that includes—

(1) proposed legislative changes and action;

(2) proposed actions to be taken collectively by executive agencies, including White House offices;

(3) proposed actions to be taken by individual executive agencies, including White House offices; and

(4) a proposal for metrics-based monitoring and oversight of the progress of the Federal Government with respect to improving conditions for the innovation occurring in and the competitiveness of the United States.

TITLE II—NATIONAL SCIENCE FOUNDATION

SEC. 201. SHORT TITLE.

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

Subtitle A—General Provisions

SEC. 211. DEFINITIONS.

In this title:

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

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

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

(4) STATE.—The term ''State'' means one of the several States, the District of Columbia, the Commonwealth of Puerto Rico, the Virgin Islands, Guam, American Samoa, the Commonwealth of the

Northern Mariana Islands, or any other territory or possession of the United States.

(5) STEM.—The term ''STEM'' means science, technology, engineering, and mathematics.

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

SEC. 212. AUTHORIZATION OF APPROPRIATIONS.

(a) FISCAL YEAR 2011.—

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

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

(A) $6,020,000,000 shall be made available for research and related activities;

(B) $945,000,000 shall be made available for education and human resources;

(C) $166,000,000 shall be made available for major research equipment and facilities construction;

(D) $330,000,000 shall be made available for agency operations and award management;

(E) $4,840,000 shall be made available for the Office of the National Science Board; and

(F) $14,830,000 shall be made available for the Office of Inspector General.

(b) FISCAL YEAR 2012.—

(1) IN GENERAL.—There are authorized to be appropriated to the Foundation $8,127,000,000 for fiscal year 2012.

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

(A) $6,496,000,000 shall be made available for research and related activities;

(B) $1,020,000,000 shall be made available for education and human resources;

(C) $235,000,000 shall be made available for major research equipment and facilities construction;

(D) $356,000,000 shall be made available for agency operations and award management;

(E) $5,010,000 shall be made available for the Office of the National Science Board; and

(F) $15,350,000 shall be made available for the Office of Inspector General.

(c) FISCAL YEAR 2013.—

(1) IN GENERAL.—There are authorized to be appropriated to the Foundation $8,764,000,000 for fiscal year 2013.

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

(A) $7,009,000,000 shall be made available for research and related activities;

(B) $1,100,000,000 shall be made available for education and human resources;

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

(D) $384,000,000 shall be made available for agency operations and award management;

(E) $5,180,000 shall be made available for the Office of the National Science Board; and

(F) $15,890,000 shall be made available for the Office of Inspector General.

(d) FISCAL YEAR 2014.—

(1) IN GENERAL.—There are authorized to be appropriated to the Foundation $9,436,000,000 for fiscal year 2014.

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

(A) $7,562,000,000 shall be made available for research and related activities;

(B) $1,187,000,000 shall be made available for education and human resources;

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

(D) $415,000,000 shall be made available for agency operations and award management;

(E) $5,370,000 shall be made available for the Office of the National Science Board; and

(F) $16,440,000 shall be made available for the Office of Inspector General.

(e) FISCAL YEAR 2015.—

(1) IN GENERAL.—There are authorized to be appropriated to the Foundation $10,161,000,000 for fiscal year 2015.

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

(A) $8,160,000,000 shall be made available for research and related activities;

(B) $1,281,000,000 shall be made available for education and human resources;

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

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

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

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

SEC. 213. NATIONAL SCIENCE BOARD ADMINISTRATIVE AMENDMENTS.

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

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

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

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

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

(2) in paragraph (3), as so redesignated by paragraph (1) of this subsection—

(A) by striking ''February 15'' and inserting ''April 15''; and

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

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

SEC. 214. BROADER IMPACTS REVIEW CRITERION.

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

(1) Increased economic competitiveness of the United States.

(2) Development of a globally competitive STEM workforce.

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

(4) Increased partnerships between academia and industry.

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

(6) Improved undergraduate STEM education.

(7) Increased public scientific literacy.

(8) Increased national security.

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

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

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

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

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

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

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

(5) requires principal investigators applying for Foundation research grants to provide evidence of institutional support for the portion of the investigator's proposal designed to satisfy the Broader Impacts Review Criterion, including evidence of relevant training, programs, and other institutional resources available to the investigator from either their home institution or organization or another institution or organization with relevant expertise.

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

(a) ESTABLISHMENT.—There is established within the Foundation a National Center for Science and Engi-

neering Statistics (in this section referred to as the ''Center''), that shall serve as a central Federal clearinghouse for the collection, interpretation, analysis, and dissemination of objective data on science, engineering, technology, and research and development.

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

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

(A) research and development trends;

(B) the science and engineering workforce;

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

(c) REPORT TO CONGRESS.—Not later than 2 years after the date of enactment of this Act, the Director shall

submit a report to Congress on how the Foundation will gather the demographic data on STEM faculty, including—

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

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

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

Subtitle B—Research and Innovation

SEC. 221. SUPPORT FOR POTENTIALLY TRANSFORMATIVE RESEARCH.

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

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

(1) develop solicitations specifically for high-risk, high-reward basic research;

(2) establish review panels for the primary purpose of selecting high-risk, high-reward proposals or modify instructions to standard review panels to require identification of high-risk, high-reward proposals; and

(3) support workshops and participate in conferences with the primary purpose of identifying new opportunities for high-risk, high-reward basic research, especially at interdisciplinary interfaces.

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

SEC. 222. FACILITATING INTERDISCIPLINARY COLLABORATIONS FOR NATIONAL NEEDS.

(a) IN GENERAL.—The Director shall award competitive, merit-based awards in amounts not to exceed $5,000,000 over a period of up to 5 years to interdisciplinary research collaborations that are likely to assist in ad-

dressing critical challenges to national security, competitiveness, and societal well-being and that—

(1) involve at least 2 co-equal principal investigators at the same or different institutions;

(2) draw upon well-integrated, diverse teams of investigators, including students or postdoctoral researchers, from one or more disciplines; and

(3) foster creativity and pursue high-risk, high-reward research.

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

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

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

(1) nanomanufacturing;

(2) manufacturing and construction machines and equipment, including robotics, automation, and other intelligent systems;

(3) manufacturing enterprise systems;

(4) advanced sensing and control techniques;

(5) materials processing; and

(6) information technologies for manufacturing, including predictive and real-time models and simulations, and virtual manufacturing.

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

SEC. 224. STRENGTHENING INSTITUTIONAL RESEARCH PARTNERSHIPS.

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

higher education in the partnership, including at least one minority-serving institution or one predominantly undergraduate institution, to ensure a strong and equitable partnership.

(b) INSTITUTIONS.—The institutions referred to in subsection (a) are institutions of higher education that are among the 100 institutions receiving, over the 3-year period immediately preceding the awarding of grants, the highest amount of research funding from the Foundation.

(c) REPORT.—Not later than one year after the date of enactment of this Act, the Director shall provide a report to Congress on institutional research partnerships identified in subsection (a) funded in the previous fiscal year.

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

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

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

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

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

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

(4) a recommendation or recommendations regarding the need for and appropriateness of a new, Foundation-wide program or initiative in support of mid-scale instrumentation, including any recommendations regarding the administration of and

budget for such a program or initiative and the appropriate scope of instruments to be funded under such a program or initiative; and

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

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

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

SEC. 227. PARTNERSHIPS FOR INNOVATION.

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

(b) PARTNERSHIPS.—

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

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

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

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

(A) A minority serving institution.

(B) A primarily undergraduate institution.

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

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

(1) increase the economic or social impact of the most promising research at the institution or in-

stitutions of higher education that are members of the partnership through knowledge transfer or commercialization;

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

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

(4) strengthen the culture of the institution or institutions of higher education to undertake and participate in activities related to innovation and leading to economic or social impact;

(5) broaden the participation of all types of institutions of higher education in activities to meet STEM workforce needs and promote innovation and knowledge transfer; and

(6) build lasting partnerships with local and regional businesses, local and State governments, and other relevant entities.

(d) ADDITIONAL CRITERIA.—In selecting grant recipients under this section, the Director shall also consider

the extent to which the applicants are able to demonstrate evidence of institutional support for, and commitment to—

(1) achieving the goals of the program as described in subsection (c);

(2) expansion to an institution-wide program if the initial proposal is not for an institution-wide program; and

(3) sustaining any new innovation tools and resources generated from funding under this program.

(e) LIMITATION.—No funds provided under this section may be used to construct or renovate a building or structure.

SEC. 228. PRIZE AWARDS.

(a) SHORT TITLE.—This section may be cited as the ''Generating Extraordinary New Innovations in the United States Act of 2010''.

(b) IN GENERAL.—The Director shall carry out a pilot program to award innovation inducement cash prizes in any area of research supported by the Foundation. The Director may carry out a program of cash prizes only in conformity with this section.

(c) TOPICS.—In identifying topics for prize competitions under this section, the Director shall—

(1) consult widely both within and outside the Federal Government;

(2) give priority to high-risk, high-reward research challenges and to problems whose solution could improve the economic competitiveness of the United States; and

(3) give consideration to the extent to which the topics have the potential to raise public awareness about federally sponsored research.

(d) TYPES OF CONTESTS.—The Director shall consider all categories of innovation inducement prizes, including—

(1) contests in which the award is to the first team or individual who accomplishes a stated objective; and

(2) contests in which the winner is the team or individual who comes closest to achieving an objective within a specified time.

(e) ADVERTISING AND ANNOUNCEMENT.—

(1) ADVERTISING AND SOLICITATION OF COMPETITORS.—The Director shall widely advertise prize competitions to encourage broad participation, including by individuals, institutions of higher education, nonprofit organizations, and businesses.

(2) ANNOUNCEMENT THROUGH FEDERAL REGISTER NOTICE.—The Director shall announce each prize competition by publishing a notice in the Federal Register. This notice shall include the subject of the competition, the duration of the competition, the eligibility requirements for participation in the competition, the process for participants to register for the competition, the amount of the prize, and the criteria for awarding the prize, including the method by which the prize winner or winners will be selected.

(3) TIME TO ANNOUNCEMENT.—The Director shall announce a prize competition within 18 months after receipt of appropriated funds.

(f) FUNDING.—

(1) FUNDING SOURCES.—Prizes under this section shall consist of Federal appropriated funds and any funds raised pursuant to donations authorized under section 11(f) of the National Science Foundation Act of 1950 (42 U.S.C. 1870(f)) for specific prize competitions.

(2) ANNOUNCEMENT OF PRIZES.—The Director may not issue a notice as required by subsection (e)(2) until all of the funds needed to pay out the announced amount of the prize have been appro-

priated or committed in writing by another entity pursuant to paragraph (1).

(g) ELIGIBILITY.—To be eligible to win a prize under this section, an individual or entity—

(1) shall have complied with all of the requirements under this section;

(2) in the case of a private entity, shall be incorporated in and maintain a primary place of business in the United States, and in the case of an individual, whether participating singly or in a group, shall be a United States citizen or national, or an alien lawfully admitted to the United States for permanent residence;

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

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

(h) AWARDS.—

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

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

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

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

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

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

tual property developed for a prize competition under this section.

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

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

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

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

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

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

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

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

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

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

(o) AUTHORIZATION OF APPROPRIATIONS.—

(1) IN GENERAL.—

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

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

(2) CARRYOVER OF FUNDS.—Funds appropriated for prize awards under this section shall remain available until expended, and may be transferred, reprogrammed, or expended for other purposes as authorized by law only after the expiration of 7 fiscal years after the fiscal year for which the funds were originally appropriated. No provision in this section permits obligation or payment of funds in violation of section 1341 of title 31 of the United States Code (commonly referred to as the Anti-Deficiency Act).

SEC. 229. COLLABORATION IN PLANNING FOR STEWARDSHIP OF LARGE-SCALE FACILITIES.

It is the sense of Congress that the Foundation should, in its planning for construction and stewardship of large facilities, coordinate and collaborate with other Federal agencies, including the Department of Energy's Office of Science, to ensure that joint investments may be made when practicable. In particular, the Foundation should ensure that it responds to recommendations by the

National Academy of Sciences and working groups convened by the National Science and Technology Council regarding such facilities and opportunities for partnership with other agencies in the design and construction of such facilities. For facilities in which research in multiple disciplines will be possible, the Director should include multiple units within the Foundation during the planning process.

SEC. 230. GREEN CHEMISTRY BASIC RESEARCH.

The Director shall establish a Green Chemistry Basic Research program to award competitive, merit-based grants to support research into green and sustainable chemistry which will lead to clean, safe, and economical alternatives to traditional chemical products and practices. The research program shall provide sustained support for green chemistry research, education, and technology transfer through—

(1) merit-reviewed competitive grants to individual investigators and teams of investigators, including, to the extent practicable, young investigators, for research;

(2) grants to fund collaborative research partnerships among universities, industry, and nonprofit organizations;

(3) symposia, forums, and conferences to increase outreach, collaboration, and dissemination of green chemistry advances and practices; and

(4) education, training, and retraining of undergraduate and graduate students and professional chemists and chemical engineers, including through partnerships with industry, in green chemistry science and engineering.

Subtitle C—STEM Education and Workforce Training

SEC. 241. GRADUATE STUDENT SUPPORT.

(a) FINDING.—The Congress finds that—

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

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

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

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

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

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

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

''(b) The Director shall establish for each year the amount to be awarded for scholarships and fellowships under this section for that year. Each such scholarship and fellowship shall include a cost of education allowance

of $12,000, subject to any restrictions on the use of cost of education allowance as determined by the Director.''.

SEC. 242. POSTDOCTORAL FELLOWSHIP IN STEM EDUCATION RESEARCH.

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

(b) AWARDS.—

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

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

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

Director determines is eligible for education research grants from the Foundation.

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

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

(1) learning processes and progressions;

(2) knowledge transfer, including curriculum development;

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

(4) integrating STEM fields; and

(5) assessment of student learning and program evaluation.

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

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

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

(e) OUTREACH.—In carrying out the program under this section, the Director shall conduct outreach efforts to encourage applications from underrepresented groups.

SEC. 243. ROBERT NOYCE TEACHER SCHOLARSHIP PROGRAM.

(a) MATCHING REQUIREMENT.—Section 10A(h)(1) of the National Science Foundation Authorization Act of 2002 (42 U.S.C. 1862n–1a(h)(1)) is amended to read as follows:

''(1) IN GENERAL.—An eligible entity receiving a grant under this section shall provide, from non-Federal sources, to carry out the activities supported by the grant—

''(A) in the case of grants in an amount of less than $1,500,000, an amount equal to at least 30 percent of the amount of the grant, at least one half of which shall be in cash; and

''(B) in the case of grants in an amount of $1,500,000 or more, an amount equal to at least 50 percent of the amount of the grant, at least one half of which shall be in cash.''.

(b) RETIRING STEM PROFESSIONALS.—Section 10A of the National Science Foundation Authorization Act of 2002 (42 U.S.C. 1862n–1a) is amended in subsection

(a)(2)(A) by inserting ''including retiring professionals in those fields,'' after ''mathematics professionals,''.

SEC. 244. INSTITUTIONS SERVING PERSONS WITH DISABILITIES.

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

SEC. 245. INSTITUTIONAL INTEGRATION.

(a) INNOVATION THROUGH INSTITUTIONAL INTEGRATION.—The Director shall award grants for the institutional integration of projects funded by the Foundation with a focus on education, or on broadening participation in STEM by underrepresented groups, for the purpose of increasing collaboration and coordination across funded

projects and institutions and expanding the impact of such projects within and among institutions of higher education in an innovative and sustainable manner.

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

(1) additional opportunities to increase the recruitment, retention, and degree attainment of underrepresented groups in STEM disciplines;

(2) the inclusion of programming, practices, and policies that encourage the integration of education and research;

(3) seamless transitions from one educational level to another, including from a 2-year to a 4-year institution; and

(4) other activities that expand and deepen the impact of Foundation-funded projects with a focus on education, or on broadening participation in STEM by underrepresented groups, and enhance their sustainability.

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

(1) the extent to which the proposed project addresses the goals of project and program integration and adds value to the existing funded projects;

(2) the extent to which there is a proven record of success for the existing projects on which the proposed integration project is based; and

(3) the extent to which the proposed project addresses the modification of programming, practices, and policies necessary to achieve the purpose described in subsection (a).

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

SEC. 246. POSTDOCTORAL RESEARCH FELLOWSHIPS.

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

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

and a research allowance, and may include an educational allowance.

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

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

(2) must have received a doctoral degree in any field of research supported by the Foundation within 3 years prior to the fellowship application deadline, or will complete a doctoral degree no more than 1 year after the application deadline; and

(3) may not have previously received funding as the principal investigator of a research grant from the Foundation, unless such funding was received as a graduate student.

(d) PRIORITY.—In evaluating applications for fellowships under this section, the Director shall give priority to applications that include—

(1) proposals for interdisciplinary research; or

(2) proposals for high-risk, high-reward research.

(e) ADDITIONAL CONSIDERATIONS.—

(1) IN GENERAL.—In evaluating applications for fellowships under this section, the Director shall

give consideration to the goal of promoting the participation of individuals identified in section 33 or 34 of the Science and Engineering Equal Opportunities Act (42 U.S.C. 1885a or 1885b) and veterans.

(2) DEFINITION.—For purposes of this subsection, the term ''veteran'' means a person who—

(A) served on active duty (other than active duty for training) in the Armed Forces of the United States for a period of more than 180 consecutive days, and who was discharged or released therefrom under conditions other than dishonorable; or

(B) served on active duty (other than active duty for training) in the Armed Forces of the United States and was discharged or released from such service for a service-connected disability before serving 180 consecutive days.

For purposes of subparagraph (B), the term ''service-connected'' has the meaning given such term under section 101 of title 38, United States Code.

(f) NONSUBSTITUTION.—The fellowship program authorized under this section is not intended to replace or reduce support for postdoctoral research through existing programs at the Foundation.

(g) OUTREACH.—In carrying out the program under this section, the Director shall conduct outreach efforts to encourage applications from underrepresented groups.

SEC. 247. BROADENING PARTICIPATION TRAINING AND OUTREACH.

The Director shall provide education and training—

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

(2) to Foundation staff on related outreach approaches.

SEC. 248. TRANSFORMING UNDERGRADUATE EDUCATION IN STEM.

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

"SEC. 17. TRANSFORMING UNDERGRADUATE EDUCATION IN STEM.

''(a) IN GENERAL.—The Director shall award grants, on a competitive, merit-reviewed basis, to institutions of higher education (or to consortia thereof) to reform undergraduate STEM education for the purpose of increasing the number and quality of students studying toward and

completing baccalaureate degrees in STEM and improving the STEM learning outcomes for all undergraduate students, including through—

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

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

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

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

''(2) expansion of undergraduate STEM research opportunities to include interdisciplinary research opportunities and research opportunities in

industry, at Federal labs, and at international research institutions or research sites;

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

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

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

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

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

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

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

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

''(d) SELECTION PROCESS.—

''(1) APPLICATIONS.—An institution of higher education seeking a grant under this section shall submit an application to the Director at such time,

in such manner, and containing such information as the Director may require. The application shall include, at a minimum—

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

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

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

"(D) a description of existing or planned institutional policies and practices regarding faculty hiring, promotion, tenure, and teaching

assignment that reward faculty contributions to undergraduate STEM education; and

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

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

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

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

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

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

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

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

SEC. 249. TWENTY-FIRST CENTURY GRADUATE EDUCATION.

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

of higher education, in industry, and at government agencies and research laboratories.

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

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

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

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

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

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

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

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

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

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

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

(d) SELECTION PROCESS.—

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

(A) a description of the proposed reform effort;

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

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

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

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

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

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

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

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

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

SEC. 250. UNDERGRADUATE BROADENING PARTICIPATION PROGRAM.

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

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

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

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

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

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

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

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

SEC. 251. GRAND CHALLENGES IN EDUCATION RESEARCH.

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

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

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

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

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

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

(2) solicit input from a wide range of stakeholders, including local and State education officials, STEM teachers, STEM education researchers, sci-

entific and engineering societies, STEM faculty at institutions of higher education, informal STEM education providers, businesses with a large STEM workforce, and other stakeholders in the teaching and learning of STEM at the pre-K–12 level, and may enter into an arrangement with the National Research Council for these purposes.

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

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

(2) Research that utilizes a systems approach to identifying challenges and opportunities to improve the teaching and learning of STEM, including development and evaluation of model systems that support improved teaching and learning of STEM across entire school districts and States, and encompassing and integrating the teaching and learning of

STEM in formal and informal venues, and in K–12 schools and institutions of higher education.

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

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

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

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

(A) improve student learning of mathematics and science;

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

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

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

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

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

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

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

(4) plans for periodically updating the grand challenges;

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

STEM programs and activities, and to non-Federal funders of STEM education; and

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

SEC. 252. RESEARCH EXPERIENCES FOR UNDERGRADUATES.

(a) RESEARCH SITES.—The Director shall award grants, on a merit-reviewed, competitive basis, to institutions of higher education, nonprofit organizations, or consortia of such institutions and organizations, for sites designated by the Director to provide research experiences for 6 or more undergraduate STEM students for sites designated at primarily undergraduate institutions of higher education and 10 or more undergraduate STEM students for all other sites, with consideration given to the goal of promoting the participation of individuals identified in section 33 or 34 of the Science and Engineering Equal Opportunities Act (42 U.S.C. 1885a or 1885b). The Director shall ensure that—

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

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

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

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

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

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

(b) INCLUSION OF UNDERGRADUATES IN STANDARD RESEARCH GRANTS.—The Director shall require that every recipient of a research grant from the Foundation proposing to include 1 or more students enrolled in certificate, associate, or baccalaureate degree programs in carrying out the research under the grant shall request sup-

port, including stipend support, for such undergraduate students as part of the research proposal itself rather than as a supplement to the research proposal, unless such undergraduate participation was not foreseeable at the time of the original proposal.

SEC. 253. LABORATORY SCIENCE PILOT PROGRAM.

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

SEC. 254. STEM INDUSTRY INTERNSHIP PROGRAMS.

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

(b) PRIORITY.—In awarding grants under this section, the Director shall give priority to institutions of higher education or consortia thereof that demonstrate significant outreach to and coordination with local or regional private sector entities in developing academic courses de-

signed to provide students with the skills necessary for employment in local or regional companies.

(c) OUTREACH TO RURAL COMMUNITIES.—The Foundation shall conduct outreach to institutions of higher education and private sector entities in rural areas to encourage those entities to participate in partnerships under this section.

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

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

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

(2) as payment or reimbursement to private sector entities, except for institutions of higher education.

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

pating students, and an economic and ethnic breakdown of the participating students.

SEC. 255. TRIBAL COLLEGES AND UNIVERSITIES PROGRAM.

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

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

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

(2) faculty development;

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

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

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

SEC. 256. CYBER-ENABLED LEARNING FOR NATIONAL CHALLENGES.

The Director shall, in consultation with appropriate Federal agencies, identify ways to use cyber-enabled learning to create an innovative STEM workforce and to help retrain and retain our existing STEM workforce to address national challenges, including national security and competitiveness.

SEC. 257. SENSE OF CONGRESS.

It is the sense of Congress that retaining graduate-level talent trained at American universities in Science, Technology, Engineering, and Mathematics (STEM) fields is critical to enhancing the competitiveness of American businesses.

TITLE III—STEM EDUCATION

SEC. 301. COORDINATION OF FEDERAL STEM EDUCATION.

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

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

(c) ESTABLISHMENT.—The Director of the Office of Science and Technology Policy shall establish a committee under the National Science and Technology Council with the responsibility to coordinate Federal programs and activities in support of STEM education, including at the National Science Foundation, the Department of Energy,

the National Aeronautics and Space Administration, the National Oceanic and Atmospheric Administration, the Department of Education, and all other Federal agencies that have programs and activities in support of STEM education.

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

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

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

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

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

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

(D) with respect to subparagraph (A), describe the role of each agency in supporting programs and activities designed to achieve the objectives;

(E) describe the approaches that will be taken by each agency to increase the participation of underrepresented minority groups in STEM studies and careers both for programs specifically designed to broaden participation and for all programs in general, including by providing for programs and activities that increase participation by individuals in these groups at all institutions, and by increasing the engagement of Historically Black Colleges and Universities and minority-serving institutions in the STEM education and outreach activities supported by the agencies; and

(F) describe the approaches that will be taken by each participating agency to conduct outreach designed to promote widespread public understanding of career opportunities in the STEM fields specific to the workforce needs of each agency, including outreach to women, Latinos, African-Americans, Native Americans, and other students from groups underrepresented in STEM; and

(3) establish, periodically update, and maintain an inventory of federally sponsored STEM education programs and activities, including documentation of

assessments of the effectiveness of such programs and activities and rates of participation by underrepresented minorities in such programs and activities; and

(4) establish and maintain a publically accessible online database of all federally sponsored STEM education programs and activities at all levels and for all audiences, including students, teachers, and the general public.

(e) RESPONSIBILITIES OF OSTP.—The Director of the Office of Science and Technology Policy shall encourage and monitor the efforts of the participating agencies to ensure that the strategic plan under subsection (d)(2) is developed and executed effectively and that the objectives of the strategic plan are met.

(f) REPORT.—The Director of the Office of Science and Technology Policy shall transmit a report annually to Congress at the time of the President's budget request describing the plan required under subsection (d)(2). The annual report shall include—

(1) a description of the STEM education programs and activities for the previous and current fiscal years, and the proposed programs and activities under the President's budget request, of each participating Federal agency;

(2) the levels of funding for each participating Federal agency for the programs and activities described under paragraph (1) for the previous fiscal year and under the President's budget request;

(3) except for the initial annual report, a description of the progress made in carrying out the implementation plan, including a description of the outcome of any program assessments completed in the previous year, and any changes made to that plan since the previous annual report; and

(4) a description of how the participating Federal agencies will disseminate information about federally supported resources for STEM education practitioners, including teacher professional development programs, to States and to STEM education practitioners, including to teachers and administrators in high-need schools, as defined in section 200 of the Higher Education Act of 1965 (20 U.S.C. 1021).

SEC. 302. ADVISORY COMMITTEE ON STEM EDUCATION.

(a) IN GENERAL.—The President shall establish or designate an advisory committee on science, technology, engineering, and mathematics (STEM) education.

(b) MEMBERSHIP.—The advisory committee established or designated by the President under subsection (a)

shall be chaired by at least 2 members of the President's Council of Advisors on Science and Technology, with the remaining advisory committee membership consisting of non-Federal members who are specially qualified to provide the President with advice and information on STEM education. Membership of the advisory committee, at a minimum, shall include individuals from the following categories of individuals and organizations:

(1) Elementary school and secondary school administrator associations.

(2) STEM educator professional associations.

(3) Organizations that provide informal STEM education activities.

(4) Institutions of higher education.

(5) Scientific and engineering professional societies.

(6) Business and industry associations.

(7) Foundations that fund STEM education activities.

(c) RESPONSIBILITIES.—The responsibilities of the advisory committee shall include—

(1) soliciting input from teachers and administrators in both public and private schools, local educational agencies, States, and other public and private STEM education stakeholder groups for the

purpose of informing the Federal agencies that support STEM education programs on the STEM education needs of States and school districts, including the unique needs of schools in rural areas;

(2) soliciting input from all STEM education, including through the interagency committee established under section 301, stakeholder groups regarding STEM education programs, including STEM education research programs, supported by Federal agencies;

(3) providing advice to the Federal agencies, including through the interagency committee established under section 301, that support STEM education programs on how their programs can be better aligned with the needs of States and school districts as identified in paragraph (1), consistent with the mission of each agency;

(4) offering guidance to the President on current STEM education activities, research findings, and best practices, with the purpose of increasing connectivity between public and private STEM education efforts;

(5) facilitating improved coordination between federally supported STEM education programs and

activities and State level activities, including the efforts of P–16 and P–20 councils in the States; and

(6) providing advice to Federal agencies on how their STEM technical training and education programs can be better aligned with the workforce needs of States and regions.

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

(1) P-16.—The term ''P–16'' refers to a system of education that encompasses preschool through undergraduate level education.

(2) P-20.—The term ''P–20'' refers to a system of education that encompasses preschool through graduate level education.

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

(a) DEFINITIONS.—Section 5002 of the America COMPETES Act (42 U.S.C. 16531) is amended—

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

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

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

''(A) nuclear science and engineering, including—

''(i) nuclear engineering;

''(ii) nuclear chemistry;

''(iii) radiochemistry; and

''(iv) health physics;

''(B) hydrocarbon system science and engineering, including—

''(i) petroleum or reservoir engineering;

''(ii) environmental geoscience;

''(iii) petrophysics;

''(iv) geophysics;

''(v) geochemistry;

''(vi) petroleum geology;

''(vii) ocean engineering;

''(viii) environmental engineering; and

''(ix) carbon capture and sequestration science and engineering;

''(C) energy efficiency and renewable energy technology systems science and engineering, including with respect to—

''(i) solar technology systems;

''(ii) wind technology systems;

''(iii) buildings technology systems;

''(iv) transportation technology systems;

''(v) hydropower systems;

''(vi) marine and hydrokinetic technology systems;

''(vii) geothermal systems; and

''(viii) biomass technology systems; and

''(D) energy storage and distribution systems science and engineering, including with respect to—

''(i) energy storage; and

''(ii) energy delivery.''.

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

(1) in section 3170—

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

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

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

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

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

''(A) nuclear science and engineering, including—

''(i) nuclear engineering;

''(ii) nuclear chemistry;

''(iii) radiochemistry; and

''(iv) health physics;

''(B) hydrocarbon system science and engineering, including—

''(i) petroleum or reservoir engineering;

''(ii) environmental geoscience;

''(iii) petrophysics;

''(iv) geophysics;

''(v) geochemistry;

''(vi) petroleum geology;

''(vii) ocean engineering;

''(viii) environmental engineering; and

''(ix) carbon capture and sequestration science and engineering;

''(C) energy efficiency and renewable energy technology systems science and engineering, including with respect to—

''(i) solar technology systems;

''(ii) wind technology systems;

''(iii) buildings technology systems;

''(iv) transportation technology systems;

''(v) hydropower systems;

''(vi) marine and hydrokinetic technology systems;

''(vii) geothermal systems; and

''(viii) biomass technology systems; and

''(D) energy storage and distribution systems science and engineering, including with respect to—

''(i) energy storage; and

''(ii) energy delivery.''; and

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

''(4) STEM.—The term 'STEM' means science, technology, engineering, and mathematics.'';

(2) by striking chapters 1, 2, 3, 4, and 6;

(3) by inserting after section 3170 the following new chapter:

"CHAPTER 1—STEM EDUCATION

"SEC. 3171. STEM EDUCATION.

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

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

"(1) informal educational programming designed to excite and inspire students and the general public about energy systems science and engineering

and other STEM disciplines supported by the Department, while strengthening their content knowledge in these fields;

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

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

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

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

''(6) competitive grants for institutions of higher education (as defined under section 101(a) of the Higher Education Act of 1965 (20 U.S.C. 1001(a))), including 2-year institutions of higher education, to establish or expand degree programs or courses in energy systems science and engineering; and

''(7) professional training for energy auditors, field technicians, and building contractors, in the areas of building energy retrofits and audits or related renewable energy technology installations.

''(c) ORGANIZATION OF STEM EDUCATION PROGRAMS.—

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

''(2) QUALIFICATIONS.—The Director shall be an individual, who by reason of professional background and experience, is specially qualified to advise the Secretary on all matters pertaining to

STEM education, including energy systems science and engineering education, at the Department.

"(3) DUTIES.—The Director shall—

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

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

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

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

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

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

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

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

''(1) identify and prioritize annual and long-term STEM education goals and objectives for the Department that are aligned with the overall goals of the National Science and Technology Council Committee on STEM Education Strategic plan re-

quired under section 301(d)(2) of the STEM Education Coordination Act of 2010;

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

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

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

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

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

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

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

(4) in section 3191—

(A) in subsection (a)—

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

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

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

(C) by striking subsection (d).

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

(1) AMENDMENT.—Strike sections 5004 and 5005 of the America COMPETES Act (42 U.S.C.

16532 and 16533) and insert the following new section:

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

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

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

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

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

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

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

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

''(3) recruit and retain new faculty;

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

''(5) encourage interdisciplinary and multidisciplinary research collaborations;

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

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

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

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

''(2) academic rigor; and

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

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

''(f) DURATION AND AMOUNT.—

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

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

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

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

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

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

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

''(5) $40,000,000 for fiscal year 2015.''.

(2) CONFORMING AMENDMENT.—The table of contents for the America COMPETES Act is

amended by striking the items relating to sections 5004 and 5005 and inserting the following:

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

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

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

(2) in subsection (b)(1)—

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

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

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

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

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

(6) in subsection (h)—

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

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

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

(1) in subsection (c)—

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

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

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

(3) by striking subsection (f).

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

SEC. 304. GREEN ENERGY EDUCATION.

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

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

(1) DIRECTOR.—The term ''Director'' means the Director of the National Science Foundation.

(2) HIGH PERFORMANCE BUILDING.—The term ''high performance building'' has the meaning given that term in section 914(a) of the Energy Policy Act of 2005 (42 U.S.C. 16194(a)).

(c) GRADUATE TRAINING IN ENERGY RESEARCH AND DEVELOPMENT.—

(1) FUNDING.—In carrying out research, development, demonstration, and commercial application activities authorized for the Department of Energy, the Secretary may contribute funds to the National Science Foundation for the Integrative Graduate Education and Research Traineeship program to support projects that enable graduate education related to such activities.

(2) CONSULTATION.—The Director shall consult with the Secretary when preparing solicitations and awarding grants for projects described in paragraph (1).

(d) CURRICULUM DEVELOPMENT FOR HIGH PERFORMANCE BUILDING DESIGN.—

(1) FUNDING.—In carrying out advanced energy technology research, development, demonstra-

tion, and commercial application activities authorized for the Department of Energy related to high performance buildings, the Secretary may contribute funds to curriculum development activities at the National Science Foundation for the purpose of improving undergraduate or graduate interdisciplinary engineering and architecture education related to the design and construction of high performance buildings, including development of curricula, of laboratory activities, of training practicums, or of design projects. A primary goal of curriculum development activities supported under this subsection shall be to improve the ability of engineers, architects, landscape architects, and planners to work together on the incorporation of advanced energy technologies during the design and construction of high performance buildings.

(2) CONSULTATION.—The Director shall consult with the Secretary when preparing solicitations and awarding grants for projects described in paragraph (1).

(3) PRIORITY.—In awarding grants with respect to which the Secretary has contributed funds under this subsection, the Director shall give priority to applications from departments, programs, or cen-

ters of a school of engineering that are partnered with schools, departments, or programs of design, architecture, landscape architecture, and city, regional, or urban planning.

SEC. 305. SENSE OF CONGRESS.

It is the Sense of Congress that—

(1) in order to maintain our Nation's competitiveness, we must improve the quality of STEM education in the Nation;

(2) the incorporation of engineering education at the elementary and secondary levels has the potential to improve student learning and achievement in science and mathematics, and to increase the technological literacy of all students;

(3) formal and informal educational providers, including K–12 schools, should integrate engineering design principles into their curriculum; and

(4) exposing elementary and secondary students to engineering education can expand students' understanding of engineering and their awareness of career opportunities in these fields.

SEC. 306. SENSE OF CONGRESS.

For science, technology, engineering, and mathematics (STEM) education programs or activities authorized under this Act or amendments made by this Act, it

is the sense of Congress that when more than 1 applicant is competing for the same grant and the applications from each applicant are considered equal in merit by the grant-awarding authority, the grant-awarding authority shall give additional consideration to any of the following:

(1) An applicant that has not previously received funding.

(2) An applicant that is an institution of higher education in a rural area.

SEC. 307. NATIONAL ACADEMY OF SCIENCES REPORT ON STRENGTHENING THE CAPACITY OF 2-YEAR INSTITUTIONS OF HIGHER EDUCATION TO PROVIDE STEM OPPORTUNITIES.

Not later than 6 months after the date of enactment of this Act, the Office of Science and Technology Policy shall enter into a contract with the National Academy of Sciences to carry out a study evaluating the role of 2-year institutions of higher education as STEM educators, including in the preparation of students for direct entry into the STEM workforce and in preparation of students for transition into 4-year STEM degree programs, as well as the role of the Federal Government in helping 2-year institutions of higher education build their capacity to be effective STEM educators. At a minimum, the report shall include—

(1) an evaluation of the current capacity of 2-year institutions of higher education to be effective STEM educators, including in the preparation of students for direct entry into the STEM workforce and for transition into 4-year STEM degree programs;

(2) a description of existing challenges to expanding opportunities for 2-year institutions of higher education to provide and enhance STEM learning and provide STEM degrees that prepare students well for direct entry into the STEM workforce or for transition into 4-year degree programs;

(3) identification and description of Federal programs that have successfully strengthened the capacity of 2-year institutions of higher education to provide and enhance STEM opportunities;

(4) a recommendation or recommendations regarding how Federal agencies should set priorities for supporting STEM education at 2-year institutions of higher education;

(5) a recommendation or recommendations regarding ways Federal agencies can provide increased opportunities for 2-year institutions of higher education to participate across their portfolios of STEM education and research programs, including—

(A) ways to engage 2-year institution of higher education faculty and students with research experiences;

(B) strategies for improving the curriculum and teaching of developmental mathematics given that many 2-year institutions of higher education provide remediation in mathematics and other STEM coursework; and

(C) enhancing the basic scientific laboratory infrastructure; and

(6) a recommendation or recommendations regarding the need for and appropriateness of new Federal programs in support of STEM education at 2-year institutions of higher education.

SEC. 308. ENCOURAGING FEDERAL SCIENTISTS AND ENGINEERS TO PARTICIPATE IN STEM EDUCATION.

Not later than 6 months after the date of enactment of this Act, the Director of the Office of Science and Technology Policy, in consultation with the Department of Education, shall develop a policy to—

(1) increase volunteerism in STEM education activities by encouraging scientists and engineers from Federal science agencies conducting nonmilitary scientific research and development, includ-

ing scientists and engineers of the federally funded research and development centers supported by those agencies, to volunteer in STEM education activities, and by providing administrative support for such scientists and engineers to engage in such volunteerism; and

(2) support increased communication and partnerships between scientists and engineers from Federal science agencies conducting nonmilitary scientific research and development, including scientists and engineers of the federally funded research and development centers supported by those agencies, and elementary and secondary schools and teachers through volunteerism in STEM education activities.

TITLE IV—NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY

SEC. 401. SHORT TITLE.

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

SEC. 402. AUTHORIZATION OF APPROPRIATIONS.

(a) FISCAL YEAR 2011.—

(1) IN GENERAL.—There are authorized to be appropriated to the Secretary of Commerce

$991,100,000 for the National Institute of Standards and Technology for fiscal year 2011.

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

(A) $620,000,000 shall be authorized for scientific and technical research and services laboratory activities;

(B) $125,000,000 shall be authorized for the construction and maintenance of facilities; and

(C) $246,100,000 shall be authorized for industrial technology services activities, of which—

(i) $95,000,000 shall be authorized for the Technology Innovation Program under section 28 of the National Institute of Standards and Technology Act (15 U.S.C. 278n);

(ii) $141,100,000 shall be authorized for the Manufacturing Extension Partnership program under sections 25 and 26 of such Act (15 U.S.C. 278k and 278l); and

(iii) $10,000,000 shall be authorized for the Malcolm Baldrige National Quality Award program under section 17 of the

Stevenson-Wydler Technology Innovation Act of 1980 (15 U.S.C. 3711a).

(b) FISCAL YEAR 2012.—

(1) IN GENERAL.—There are authorized to be appropriated to the Secretary of Commerce $992,400,000 for the National Institute of Standards and Technology for fiscal year 2012.

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

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

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

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

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

(ii) $150,900,000 shall be authorized for the Manufacturing Extension Partner-

ship program under sections 25 and 26 of such Act (15 U.S.C. 278k and 278l); and

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

(c) FISCAL YEAR 2013.—

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

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

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

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

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

(i) $89,000,000 shall be authorized for the Technology Innovation Program

under section 28 of the National Institute of Standards and Technology Act (15 U.S.C. 278n);

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

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

(d) FISCAL YEAR 2014.—

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

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

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

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

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

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

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

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

(e) FISCAL YEAR 2015.—

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

''(e) APPLICABILITY.—The individual serving as the Director of the Institute on the date of enactment of the National Institute of Standards and Technology Authorization Act of 2010 shall also serve as the Under Secretary

until such time as a successor is appointed under subsection (b).''.

(b) CONFORMING AMENDMENTS.—

(1) TITLE 5, UNITED STATES CODE.—

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

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

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

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

SEC. 404. REORGANIZATION OF NIST LABORATORIES.

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

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

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

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

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

(5) The Center for Nanoscale Science and Technology, a national shared-use facility for nanoscale fabrication and measurement, whose mission is to develop innovative nanoscale measurement and fabrication capabilities to support researchers from industry, institutions of higher education, the National Institute of Standards and Technology, and other Federal agencies in nanoscale technology from discovery to production.

(6) The NIST Center for Neutron Research, a national user facility, whose mission is to provide neutron-based measurement capabilities to researchers from industry, institutions of higher education, the National Institute of Standards and Technology, and other Federal agencies in support of materials

research, nondestructive evaluation, neutron imaging, chemical analysis, neutron standards, dosimetry, and radiation metrology.

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

(c) REVISION.—

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

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

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

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

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

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

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

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

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

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

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

(b) REPORT.—The Director, in consultation with appropriate Federal agencies, shall submit a report annually

to Congress addressing the Federal Government's technical standards and conformity assessment-related activities. The report shall identify—

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

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

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

SEC. 406. MANUFACTURING EXTENSION PARTNERSHIP.

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

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

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

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

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

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

''(g) INNOVATIVE SERVICES INITIATIVE.—

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

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

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

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

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

''(h) REPORTS.—

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

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

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

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

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

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

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

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

''(4) FEDERAL ADVISORY COMMITTEE ACT APPLICABILITY.—

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

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

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

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

(g) EVALUATION OF OBSTACLES UNIQUE TO SMALL MANUFACTURERS.—Section 25 of such Act (15 U.S.C. 278k) is further amended by adding after subsection (i), as added by subsection (f), the following:

''(j) EVALUATION OF OBSTACLES UNIQUE TO SMALL MANUFACTURERS.—The Director shall—

''(1) evaluate obstacles that are unique to small manufacturers that prevent such manufacturers from effectively competing in the global market;

''(2) implement a comprehensive plan to train the Centers to address such obstacles; and

''(3) facilitate improved communication between the Centers to assist such manufacturers in imple-

menting appropriate, targeted solutions to such obstacles.''.

SEC. 407. EMERGENCY COMMUNICATION AND TRACKING TECHNOLOGIES RESEARCH INITIATIVE.

(a) ESTABLISHMENT.—The Director shall establish a research initiative to support the development of emergency communication and tracking technologies for use in locating trapped individuals in confined spaces, such as underground mines, and other shielded environments, such as high-rise buildings or collapsed structures, where conventional radio communication is limited.

(b) ACTIVITIES.—In order to carry out this section, the Director shall work with the private sector and appropriate Federal agencies to—

(1) perform a needs assessment to identify and evaluate the measurement, technical standards, and conformity assessment needs required to improve the operation and reliability of such emergency communication and tracking technologies;

(2) support the development of technical standards and conformance architecture to improve the operation and reliability of such emergency communication and tracking technologies; and

(3) incorporate and build upon existing reports and studies on improving emergency communications.

(c) REPORT.—Not later than 18 months after the date of enactment of this Act, the Director shall submit to Congress and make publicly available a report describing the assessment performed under subsection (b)(1) and making recommendations about research priorities to address gaps in the measurement, technical standards, and conformity assessment needs identified by such assessment.

SEC. 408. TIP ADVISORY BOARD.

Section 28(k)(4) of the National Institute of Standards and Technology Act (15 U.S.C. 278n(k)(4)) is amended to read as follows:

''(4) FEDERAL ADVISORY COMMITTEE ACT APPLICABILITY.—

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

''(B) EXCEPTION.—Section 14 of the Federal Advisory Committee Act shall not apply to the TIP Advisory Board.''.

SEC. 409. UNDERREPRESENTED MINORITIES.

(a) RESEARCH FELLOWSHIPS.—Section 18 of the National Institute of Standards and Technology Act (15 U.S.C. 278g–1) is amended by adding at the end the following:

''(c) UNDERREPRESENTED MINORITIES.—In evaluating applications for fellowships under this section, the Director shall give consideration to the goal of promoting the participation of underrepresented minorities in research areas supported by the Institute.''.

(b) POSTDOCTORAL FELLOWSHIP PROGRAM.—Section 19 of such Act (15 U.S.C. 278g–2) is amended by adding at the end the following: ''In evaluating applications for fellowships under this section, the Director shall give consideration to the goal of promoting the participation of underrepresented minorities in research areas supported by the Institute.''.

(c) TEACHER DEVELOPMENT.—Section 19A(c) of such Act (15 U.S.C. 278g–2a(c)) is amended by adding at the end the following: ''The Director shall give special consideration to an application from a teacher from a high-need school, as defined in section 200 of the Higher Education Act of 1965 (20 U.S.C. 1021).''.

SEC. 410. CYBER SECURITY STANDARDS AND GUIDELINES.

Cyber security standards and guidelines developed by the National Institute of Standards and Technology for

use by United States industry and the public shall be voluntary.

SEC. 411. NANOMATERIAL INITIATIVE.

The Director shall carry out a nanomaterial research initiative to—

(1) develop reference materials for nanomaterials and derived products to be used in benchmarking toxicity, calibrating instruments, and facilitating laboratory comparisons;

(2) assist in the development of international documentary standards relating to nanomaterials;

(3) develop instruments and measurement methods to determine the physical and chemical properties of nanomaterials; and

(4) gather and develop data to support the correlation of physical and chemical properties of nanomaterials to any environmental, safety, or other risks.

SEC. 412. DISASTER RESILIENT BUILDINGS AND INFRASTRUCTURE.

(a) ESTABLISHMENT.—The Director shall carry out a disaster resilient buildings and infrastructure program.

(b) REAL-SCALE STRUCTURES.—As part of the program, the Director shall—

(1) develop the capability to test real-scale structures under realistic fire and structural loading conditions; and

(2) assist in the validation of predictive models by developing a database on the performance of large-scale structures under realistic fire and structural loading conditions.

(c) DATABASE.—As part of the program, the Director shall develop a database on the performance of the built environment during natural and man-made hazard events.

SEC. 413. REPORT ON THE USE OF MODELING AND SIMULATION.

(a) IN GENERAL.—Within 1 year after the date of enactment of this Act, the Director shall submit a report to Congress examining the use of high-performance computational modeling and simulation by small- and medium-sized manufacturers.

(b) SPECIFIC REQUIREMENTS.—Such report shall include the following:

(1) An assessment of the current utilization of high-performance computational modeling and simulation by small- and medium-sized manufacturers.

(2) An examination of any barriers or challenges to the use of high-performance computational

modeling and simulation by small- and medium-sized manufacturers, including—

(A) access to high-performance computing facilities and resources;

(B) the availability of software and other applications tailored to meet the needs of such manufacturers;

(C) appropriate expertise and training; and

(D) the availability of tools and other methods to understand and manage the costs and risks associated with transitioning to the use of computational modeling and simulation.

(3) Recommendations for addressing any barriers or challenges identified in paragraph (2) and, if appropriate, suggestions for action that the Federal Government may take to foster the development and utilization of high-performance computing resources by small- and medium-sized manufacturers.

(c) CONSULTATION.—In carrying out this section, the Director shall consult with the Office of Science and Technology Policy and with other relevant Federal agencies.

SEC. 414. GREEN MANUFACTURING AND CONSTRUCTION.

The Director shall carry out a green manufacturing and construction initiative to—

(1) develop accurate sustainability metrics and practices for use in manufacturing;

(2) advance the development of standards and the creation of an information infrastructure to communicate sustainability information about suppliers; and

(3) improve energy performance, service life, and indoor air quality of new and retrofitted buildings through validated measurement data.

SEC. 415. MANUFACTURING RESEARCH.

(a) IN GENERAL.—The Director shall carry out a program to support transformational manufacturing research.

(b) ACTIVITIES.—As part of such program, the Director shall—

(1) develop and disseminate measurement tools and capabilities for new additive manufacturing and robotics technologies and methods;

(2) establish new techniques and methods to efficiently generate and assemble products integrating nanoscale materials and devices; and

(3) carry out other research with significant transformational potential for manufacturing.

SEC. 416. DEFINITIONS.

In this title:

(1) DIRECTOR.—The term ''Director'' means the Director of the National Institute of Standards and Technology.

(2) FEDERAL AGENCY.—The term ''Federal agency'' has the meaning given such term in section 4 of the Stevenson-Wydler Technology Innovation Act of 1980 (15 U.S.C. 3703).

TITLE V—INNOVATION

SEC. 501. OFFICE OF INNOVATION AND ENTREPRENEURSHIP.

The Stevenson-Wydler Technology Innovation Act of 1980 (15 U.S.C. 3701 et seq.) is amended by adding at the end the following new section:

''SEC. 24. OFFICE OF INNOVATION AND ENTREPRENEURSHIP.

''(a) IN GENERAL.—The Secretary shall establish an Office of Innovation and Entrepreneurship to foster innovation and the commercialization of new technologies, products, processes, and services with the goal of promoting productivity and economic growth in the United States.

''(b) DUTIES.—The Office of Innovation and Entrepreneurship shall be responsible for—

''(1) developing policies to accelerate innovation and advance the commercialization of research and

development, including federally funded research and development;

''(2) identifying existing barriers to innovation and commercialization, including access to capital and other resources, and ways to overcome those barriers;

''(3) providing access to relevant data, research, and technical assistance on innovation and commercialization;

''(4) strengthening collaboration on and coordination of policies relating to innovation and commercialization, including those focused on the needs of small businesses and rural communities, within the Department of Commerce and between the Department of Commerce and other Federal agencies, as appropriate; and

''(5) any other duties as determined by the Secretary.

''(c) ADVISORY COMMITTEE.—The Secretary shall establish an Advisory Council on Innovation and Entrepreneurship to provide advice to the Secretary on carrying out subsection (b).''.

SEC. 502. FEDERAL LOAN GUARANTEES FOR INNOVATIVE TECHNOLOGIES IN MANUFACTURING.

The Stevenson-Wydler Technology Innovation Act of 1980 (15 U.S.C. 3701 et seq.) is further amended by adding after section 24, as added by section 501 of this title, the following new section:

"SEC. 25. FEDERAL LOAN GUARANTEES FOR INNOVATIVE TECHNOLOGIES IN MANUFACTURING.

''(a) ESTABLISHMENT.—The Secretary shall establish a program to provide loan guarantees for obligations to small- or medium-sized manufacturers for the use or production of innovative technologies.

''(b) ELIGIBLE PROJECTS.—A loan guarantee may be made under such program only for a project that reequips, expands, or establishes a manufacturing facility in the United States to—

''(1) use an innovative technology or an innovative process in manufacturing; or

''(2) manufacture an innovative technology product or an integral component of such product.

''(c) ELIGIBLE BORROWER.—A loan guarantee may be made under such program only for a borrower who is a small- or medium-sized manufacturer, as determined by the Secretary under the criteria established pursuant to subsection (m).

''(d) LIMITATION ON AMOUNT.—A loan guarantee shall not exceed an amount equal to 80 percent of the obligation, as estimated at the time at which the loan guarantee is issued.

''(e) LIMITATIONS ON LOAN GUARANTEE.—No loan guarantee shall be made unless the Secretary determines that—

''(1) there is a reasonable prospect of repayment of the principal and interest on the obligation by the borrower;

''(2) the amount of the obligation (when combined with amounts available to the borrower from other sources) is sufficient to carry out the project;

''(3) the obligation is not subordinate to other financing;

''(4) the obligation bears interest at a rate that does not exceed a level that the Secretary determines appropriate, taking into account the prevailing rate of interest in the private sector for similar loans and risks; and

''(5) the term of an obligation requires full repayment over a period not to exceed the lesser of—

''(A) 30 years; or

"(B) 90 percent of the projected useful life, as determined by the Secretary, of the physical asset to be financed by the obligation.

"(f) DEFAULTS.—

"(1) PAYMENT BY SECRETARY.—

"(A) IN GENERAL.—If a borrower defaults (as defined in regulations promulgated by the Secretary and specified in the loan guarantee) on the obligation, the holder of the loan guarantee shall have the right to demand payment of the unpaid amount from the Secretary.

"(B) PAYMENT REQUIRED.—Within such period as may be specified in the loan guarantee or related agreements, the Secretary shall pay to the holder of the loan guarantee the unpaid interest on and unpaid principal of the obligation as to which the borrower has defaulted, unless the Secretary finds that there was no default by the borrower in the payment of interest or principal or that the default has been remedied.

"(C) FORBEARANCE.—Nothing in this subsection precludes any forbearance by the holder of the obligation for the benefit of the borrower

which may be agreed upon by the parties to the obligation and approved by the Secretary.

''(2) SUBROGATION.—

''(A) IN GENERAL.—If the Secretary makes a payment under paragraph (1), the Secretary shall be subrogated to the rights, as specified in the loan guarantee, of the recipient of the payment or related agreements including, if appropriate, the authority (notwithstanding any other provision of law) to—

''(i) complete, maintain, operate, lease, or otherwise dispose of any property acquired pursuant to such loan guarantee or related agreement; or

''(ii) permit the borrower, pursuant to an agreement with the Secretary, to continue to pursue the purposes of the project if the Secretary determines that such an agreement is in the public interest.

''(B) SUPERIORITY OF RIGHTS.—The rights of the Secretary, with respect to any property acquired pursuant to a loan guarantee or related agreements, shall be superior to the rights of any other person with respect to the property.

''(3) NOTIFICATION.—If the borrower defaults on an obligation, the Secretary shall notify the Attorney General of the default.

''(g) PAYMENT OF PRINCIPAL AND INTEREST BY SECRETARY.—With respect to any obligation guaranteed under this section, the Secretary may enter into a contract to pay, and pay, holders of the obligation for and on behalf of the borrower from funds appropriated for that purpose the principal and interest payments that become due and payable on the unpaid balance of the obligation if the Secretary finds that—

''(1)(A) the borrower is unable to make the payments and is not in default;

''(B) it is in the public interest to permit the borrower to continue to pursue the project; and

''(C) the probable net benefit to the Federal Government in paying the principal and interest will be greater than that which would result in the event of a default;

''(2) the amount of the payment that the Secretary is authorized to pay shall be no greater than the amount of principal and interest that the borrower is obligated to pay under the obligation being guaranteed; and

''(3) the borrower agrees to reimburse the Secretary for the payment (including interest) on terms and conditions that are satisfactory to the Secretary.

''(h) TERMS AND CONDITIONS.—A loan guarantee under this section shall include such detailed terms and conditions as the Secretary determines appropriate to—

''(1) protect the interests of the United States in the case of default; and

''(2) have available all the patents and technology necessary for any person selected, including the Secretary, to complete and operate the project.

''(i) CONSULTATION.—In establishing the terms and conditions of a loan guarantee under this section, the Secretary shall consult with the Secretary of the Treasury.

''(j) FEES.—

''(1) IN GENERAL.—The Secretary shall charge and collect fees for loan guarantees in amounts the Secretary determines are sufficient to cover applicable administrative expenses.

''(2) AVAILABILITY.—Fees collected under this subsection shall—

''(A) be deposited by the Secretary into the Treasury of the United States; and

"(B) remain available until expended, subject to such other conditions as are contained in annual appropriations Acts.

"(3) LIMITATION.—In charging and collecting fees under paragraph (1), the Secretary shall take into consideration the amount of the obligation.

"(k) RECORDS.—

"(1) IN GENERAL.—With respect to a loan guarantee under this section, the borrower, the lender, and any other appropriate party shall keep such records and other pertinent documents as the Secretary shall prescribe by regulation, including such records as the Secretary may require to facilitate an effective audit.

"(2) ACCESS.—The Secretary and the Comptroller General of the United States, or their duly authorized representatives, shall have access to records and other pertinent documents for the purpose of conducting an audit.

"(l) FULL FAITH AND CREDIT.—The full faith and credit of the United States is pledged to the payment of all loan guarantees issued under this section with respect to principal and interest.

''(m) REGULATIONS.—The Secretary shall issue final regulations before making any loan guarantees under the program. Such regulations shall include—

''(1) criteria that the Secretary shall use to determine eligibility for loan guarantees under this section, including—

''(A) whether a borrower is a small- or medium-sized manufacturer; and

''(B) whether a borrower demonstrates that a market exists for the innovative technology product, or the integral component of such product, to be manufactured, as evidenced by written statements of interest from potential purchasers;

''(2) criteria that the Secretary shall use to determine the amount of any fees charged under subsection (j), including criteria related to the amount of the obligation;

''(3) policies and procedures for selecting and monitoring lenders and loan performance; and

''(4) any other policies, procedures, or information necessary to implement this section.

''(n) AUDIT.—

''(1) ANNUAL INDEPENDENT AUDITS.—The Secretary shall enter into an arrangement with an

independent auditor for annual evaluations of the program under this section.

''(2) COMPTROLLER GENERAL REVIEW.—The Comptroller General of the United States shall conduct a biennial review of the Secretary's execution of the program under this section.

''(3) REPORT.—The results of the independent audit under paragraph (1) and the Comptroller General's review under paragraph (2) shall be provided directly to the Committee on Science and Technology of the House of Representatives and the Committee on Commerce, Science, and Transportation of the Senate.

''(o) REPORT TO CONGRESS.—Concurrent with the submission to Congress of the President's annual budget request in each year after the date of enactment of this section, the Secretary shall transmit to the Committee on Science and Technology of the House of Representatives and the Committee on Commerce, Science, and Transportation of the Senate a report containing a summary of all activities carried out under this section.

''(p) COORDINATION AND NONDUPLICATION.—To the maximum extent practicable, the Secretary shall ensure that the activities carried out under this section are

coordinated with, and do not duplicate the efforts of, other loan guarantee programs within the Federal Government.

''(q) MEP CENTERS.—The Secretary may use centers established under section 25 of the National Institute of Standards and Technology Act (15 U.S.C. 278k) to provide information about the program established under this section and to conduct outreach to potential borrowers, as appropriate.

''(r) MINIMIZING RISK.—The Secretary shall promulgate regulations and policies to carry out this section in accordance with Office of Management and Budget Circular No. A–129, entitled 'Policies for Federal Credit Programs and Non-Tax Receivables', as in effect on the date of enactment of this section.

''(s) SENSE OF CONGRESS.—It is the sense of Congress that no loan guarantee shall be made under this section unless the borrower agrees to use a federally-approved electronic employment eligibility verification system to verify the employment eligibility of—

''(1) all persons hired during the contract term by the borrower to perform employment duties within the United States; and

''(2) all persons assigned by the borrower to perform work within the United States on the project.

''(t) DEFINITIONS.—In this section:

''(1) COST.—The term 'cost' has the meaning given such term under section 502 of the Federal Credit Reform Act of 1990 (2 U.S.C. 661a).

''(2) INNOVATIVE PROCESS.—The term 'innovative process' means a process that is significantly improved as compared to the process in general use in the commercial marketplace in the United States at the time the loan guarantee is issued.

''(3) INNOVATIVE TECHNOLOGY.—The term 'innovative technology' means a technology that is significantly improved as compared to the technology in general use in the commercial marketplace in the United States at the time the loan guarantee is issued.

''(4) LOAN GUARANTEE.—The term 'loan guarantee' has the meaning given such term in section 502 of the Federal Credit Reform Act of 1990 (2 U.S.C. 661a). The term includes a loan guarantee commitment (as defined in section 502 of such Act (2 U.S.C. 661a)).

''(5) OBLIGATION.—The term 'obligation' means the loan or other debt obligation that is guaranteed under this section.

''(6) PROGRAM.—The term 'program' means the loan guarantee program established in subsection (a).

''(u) AUTHORIZATION OF APPROPRIATIONS.—

''(1) COST OF LOAN GUARANTEES.—There are authorized to be appropriated $100,000,000 for each of fiscal years 2011 through 2015 to provide the cost of loan guarantees under this section.

''(2) PRINCIPAL AND INTEREST.—There are authorized to be appropriated such sums as are necessary to carry out subsection (g).''.

SEC. 503. REGIONAL INNOVATION PROGRAM.

The Stevenson-Wydler Technology Innovation Act of 1980 (15 U.S.C. 3701 et seq.) is further amended by adding after section 25, as added by section 502 of this title, the following new section:

''SEC. 26. REGIONAL INNOVATION PROGRAM.

''(a) ESTABLISHMENT.—The Secretary shall establish a regional innovation program to encourage and support the development of regional innovation strategies, including regional innovation clusters.

''(b) REGIONAL INNOVATION CLUSTER GRANTS.—

''(1) IN GENERAL.—As part of the program established under subsection (a), the Secretary may award grants on a competitive basis to eligible re-

cipients for activities relating to the formation and development of regional innovation clusters.

''(2) PERMISSIBLE ACTIVITIES.—Grants awarded under this subsection may be used for activities determined appropriate by the Secretary, including the following:

''(A) Feasibility studies.

''(B) Planning activities.

''(C) Technical assistance.

''(D) Developing or strengthening communication and collaboration between and among participants of a regional innovation cluster.

''(E) Attracting additional participants to a regional innovation cluster.

''(F) Facilitating market development of products and services developed by a regional innovation cluster, including through demonstration, deployment, technology transfer, and commercialization activities.

''(G) Developing relationships between a regional innovation cluster and entities or clusters in other regions.

''(H) Interacting with the public and State and local governments to meet the goals of the cluster.

''(3) ELIGIBLE RECIPIENT.—For purposes of this subsection, the term 'eligible recipient' means any of the following:

''(A) A State.

''(B) An Indian tribe.

''(C) A city or other political subdivision of a State.

''(D) An entity that—

''(i) is a nonprofit organization, an institution of higher education, a public-private partnership, a science park, a Federal laboratory, or an economic development organization or similar entity; and

''(ii) has an application that is supported by a State or a political subdivision of a State.

''(E) A consortium of any of the entities listed in subparagraphs (A) through (D).

''(4) APPLICATION.—

''(A) IN GENERAL.—An eligible recipient shall submit an application to the Secretary at such time, in such manner, and containing such information and assurances as the Secretary may require.

''(B) COMPONENTS.—The application shall include, at a minimum, a description of the regional innovation cluster supported by the proposed activity, including a description of the following:

''(i) Whether the regional innovation cluster is supported by the private sector, State and local governments, and other relevant stakeholders.

''(ii) How the existing participants in the regional innovation cluster will encourage and solicit participation by all types of entities that might benefit from participation, including newly formed entities and those rival to existing participants.

''(iii) The extent to which the regional innovation cluster is likely to stimulate innovation and have a positive impact on regional economic growth and development.

''(iv) Whether the participants in the regional innovation cluster have access to, or contribute to, a well-trained workforce.

''(v) Whether the participants in the regional innovation cluster are capable of

attracting additional funds from non-Federal sources.

''(vi) The likelihood that the participants in the regional innovation cluster will be able to sustain activities once grant funds under this subsection have been expended.

''(C) SPECIAL CONSIDERATION.—The Secretary shall give special consideration to applications from regions that contain communities negatively impacted by trade.

''(5) SPECIAL CONSIDERATION.—The Secretary shall give special consideration to an eligible recipient who agrees to collaborate with local workforce investment area boards.

''(6) COST SHARE.—The Secretary may not provide more than 50 percent of the total cost of any activity funded under this subsection.

''(7) USE AND APPLICATION OF RESEARCH AND INFORMATION PROGRAM.—To the maximum extent practicable, the Secretary shall ensure that activities funded under this subsection use and apply any relevant research, best practices, and metrics developed under the program established in subsection (c).

''(c) REGIONAL INNOVATION RESEARCH AND INFORMATION PROGRAM.—

''(1) IN GENERAL.—As part of the program established under subsection (a), the Secretary shall establish a regional innovation research and information program to—

''(A) gather, analyze, and disseminate information on best practices for regional innovation strategies (including regional innovation clusters), including information relating to how innovation, productivity, and economic development can be maximized through such strategies;

''(B) provide technical assistance, including through the development of technical assistance guides, for the development and implementation of regional innovation strategies (including regional innovation clusters);

''(C) support the development of relevant metrics and measurement standards to evaluate regional innovation strategies (including regional innovation clusters), including the extent to which such strategies stimulate innovation, productivity, and economic development; and

''(D) collect and make available data on regional innovation cluster activity in the United States, including data on—

''(i) the size, specialization, and competitiveness of regional innovation clusters;

''(ii) the regional domestic product contribution, total jobs and earnings by key occupations, establishment size, nature of specialization, patents, Federal research and development spending, and other relevant information for regional innovation clusters; and

''(iii) supply chain product and service flows within and between regional innovation clusters.

''(2) RESEARCH GRANTS.—The Secretary may award research grants on a competitive basis to support and further the goals of the program established under this subsection.

''(3) DISSEMINATION OF INFORMATION.—Data and analysis compiled by the Secretary under the program established in this subsection shall be made available to other Federal agencies, State and local governments, and nonprofit and for-profit entities.

''(4) CLUSTER GRANT PROGRAM.—The Secretary shall incorporate data and analysis relating to any regional innovation cluster supported by a grant under subsection (b) into the program established under this subsection.

''(d) INTERAGENCY COORDINATION.—

''(1) IN GENERAL.—To the maximum extent practicable, the Secretary shall ensure that the activities carried out under this section are coordinated with, and do not duplicate the efforts of, other programs at the Department of Commerce or other Federal agencies.

''(2) COLLABORATION.—

''(A) IN GENERAL.—The Secretary shall explore and pursue collaboration with other Federal agencies, including through multi-agency funding opportunities, on regional innovation strategies.

''(B) SMALL BUSINESSES.—The Secretary shall ensure that such collaboration with Federal agencies prioritizes the needs and challenges of small businesses.

''(e) EVALUATION.—

''(1) IN GENERAL.—Not later than 4 years after the date of enactment of this section, the Sec-

retary shall enter into a contract with an independent entity, such as the National Academy of Sciences, to conduct an evaluation of the program established under subsection (a).

''(2) REQUIREMENTS.—The evaluation shall include—

''(A) whether such program is achieving its goals;

''(B) any recommendations for how such program may be improved; and

''(C) a recommendation as to whether such program should be continued or terminated.

''(f) DEFINITIONS.—In this section:

''(1) REGIONAL INNOVATION CLUSTER.—The term 'regional innovation cluster' means a geographically bounded network of similar, synergistic, or complementary entities that—

''(A) are engaged in or with a particular industry sector;

''(B) have active channels for business transactions and communication;

''(C) share specialized infrastructure, labor markets, and services; and

''(D) leverage the region's unique competitive strengths to stimulate innovation and create jobs.

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

''(g) AUTHORIZATION OF APPROPRIATIONS.—There are authorized to be appropriated such sums as are necessary for each of fiscal years 2011 through 2015 to carry out this section, including such sums as are necessary to carry out the evaluation required under subsection (e).''.

SEC. 504. CLEAN ENERGY CONSORTIUM.

(a) PURPOSE.—The Secretary shall carry out a program to establish a Clean Energy Consortium to enhance the Nation's economic, environmental, and energy security by promoting commercial application of clean energy technology and ensuring that the United States maintains a technological lead in the development and commercial application of state-of-the-art energy technologies. To achieve these purposes the program shall leverage the expertise and resources of the university and private research communities, industry, venture capital, national

laboratories, and other participants in energy innovation to support collaborative, cross-disciplinary research and development in areas not being served by the private sector in order to develop and accelerate the commercial application of innovative clean energy technologies.

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

(1) CLEAN ENERGY TECHNOLOGY.—The term ''clean energy technology'' means a technology that—

(A) produces energy from solar, wind, geothermal, biomass, tidal, wave, ocean, and other renewable energy resources (as such term is defined in section 610 of the Public Utility Regulatory Policies Act of 1978);

(B) more efficiently transmits, distributes, or stores energy;

(C) enhances energy efficiency for buildings and industry, including combined heat and power;

(D) enables the development of a Smart Grid (as described in section 1301 of the Energy Independence and Security Act of 2007 (42 U.S.C. 17381)), including integration of renewable energy resources and distributed gen-

eration, demand response, demand side management, and systems analysis;

(E) produces an advanced or sustainable material with energy or energy efficiency applications; or

(F) improves energy efficiency for transportation, including electric vehicles.

(2) CLUSTER.—The term ''cluster'' means a network of entities directly involved in the research, development, finance, and commercial application of clean energy technologies whose geographic proximity facilitates utilization and sharing of skilled human resources, infrastructure, research facilities, educational and training institutions, venture capital, and input suppliers.

(3) CONSORTIUM.—The term ''Consortium'' means a Clean Energy Consortium established in accordance with this section.

(4) PROJECT.—The term ''project'' means an activity with respect to which a Consortium provides support under subsection (e).

(5) QUALIFYING ENTITY.—The term ''qualifying entity'' means each of the following:

(A) A research university.

(B) A State or Federal institution with a focus on the advancement of clean energy technologies.

(C) A nongovernmental organization with research or technology transfer expertise in clean energy technology development.

(6) SECRETARY.—The term ''Secretary'' means the Secretary of Energy.

(7) TECHNOLOGY DEVELOPMENT FOCUS.—The term ''technology development focus'' means the unique clean energy technology or technologies in which a Consortium specializes.

(8) TRANSLATIONAL RESEARCH.—The term ''translational research'' means coordination of basic or applied research with technical applications to enable promising discoveries or inventions to achieve commercial application of energy technology.

(c) ROLE OF THE SECRETARY.—The Secretary shall—

(1) have ultimate responsibility for, and oversight of, all aspects of the program under this section;

(2) select a recipient of a grant for the establishment and operation of a Consortium through a competitive selection process;

(3) coordinate the innovation activities of the Consortium with those occurring through other Department of Energy entities, including the National Laboratories, the Advanced Research Projects Agency—Energy, Energy Innovation Hubs, and Energy Frontier Research Collaborations, and within industry, including by annually—

(A) issuing guidance regarding national energy research and development priorities and strategic objectives; and

(B) convening a conference of staff of the Department of Energy and representatives from such other entities to share research results, program plans, and opportunities for collaboration.

(d) ENTITIES ELIGIBLE FOR SUPPORT.—A consortium shall be eligible to receive support under this section if—

(1) it is composed of—

(A) 2 research universities with a combined annual research budget of $500,000,000; and

(B) 1 or more additional qualifying entities;

(2) its members have established a binding agreement that documents—

(A) the structure of the partnership agreement;

(B) a governance and management structure to enable cost-effective implementation of the program;

(C) a conflicts of interest policy consistent with subsection (e)(1)(B);

(D) an accounting structure that meets the requirements of the Department of Energy and can be audited under subsection (f)(4); and

(E) that it has an External Advisory Committee consistent with subsection (e)(3);

(3) it receives funding from States, consortium participants, or other non-Federal sources, to be used to support project awards pursuant to subsection (e);

(4) it is part of an existing cluster or demonstrates high potential to develop a new cluster; and

(5) it operates as a nonprofit organization.

(e) CLEAN ENERGY CONSORTIUM.—

(1) ROLE.—The Consortium shall support translational research activities leading to commer-

cial application of clean energy technologies, in accordance with the purposes of this section, through issuance of awards to projects managed by qualifying entities and other entities meeting the Consortium's project criteria, including national laboratories. The Consortium shall—

(A) develop and make available to the public through the Department of Energy's Web site proposed plans, programs, project selection criteria, and terms for individual project awards under this subsection;

(B) establish conflict of interest procedures, consistent with those of the Department of Energy, to ensure that employees and designees for Consortium activities who are in decisionmaking capacities disclose all material conflicts of interest, including financial, organizational, and personal conflicts of interest;

(C) establish policies—

(i) to prevent resources provided to the Consortium from being used to displace private sector investment otherwise likely to occur, including investment from private sector entities that are members of the Consortium;

(ii) to facilitate the participation of private entities that invest in clean energy technologies to perform due diligence on award proposals, to participate in the award review process, and to provide guidance to projects supported by the Consortium; and

(iii) to facilitate the participation of parties with a demonstrated history of commercial application of clean energy technologies in the development of Consortium projects;

(D) oversee project solicitations, review proposed projects, and select projects for awards; and

(E) monitor project implementation.

(2) DISTRIBUTION OF AWARDS.—The Consortium, with prior approval of the Secretary, shall distribute awards under this subsection to support clean energy technology projects conducting translational research, provided that at least 50 percent of such support shall be provided to projects related to the Consortium's clean energy technology development focus. Upon approval by the Secretary, all remaining funds shall be available to support any

clean energy technology projects conducting translational research.

(3) EXTERNAL ADVISORY COMMITTEE.—

(A) IN GENERAL.—The Consortium shall establish an External Advisory Committee, the members of which shall have extensive and relevant scientific, technical, industry, financial, or research management expertise. The External Advisory Committee shall review the Consortium's proposed plans, programs, project selection criteria, and projects and shall ensure that projects selected for awards meet the conflict of interest policies of the Consortium. External Advisory Committee members other than those representing Consortium members shall serve for no more than 3 years. All External Advisory Committee members shall comply with the Consortium's conflict of interest policies and procedures.

(B) MEMBERS.—The External Advisory Committee shall consist of—

(i) 5 members selected by the Consortium's research universities;

(ii) 2 members selected by the Consortium's other qualifying entities;

(iii) 2 members selected at large by other External Advisory Committee members to represent the entrepreneur and venture capital communities; and

(iv) 1 member appointed by the Secretary.

(4) CONFLICT OF INTEREST.—The Secretary may disqualify an application or revoke funds distributed to the Consortium if the Secretary discovers a failure to comply with conflict of interest procedures established under paragraph (1)(B).

(f) GRANT.—

(1) IN GENERAL.—The Secretary shall make a grant under this section in accordance with section 989 of the Energy Policy Act of 2005 (42 U.S.C. 16353). The Secretary shall award the grant, on a competitive basis, to 1 regional Consortium, for a term of 3 years.

(2) AMOUNT.—A grant under this subsection shall be in an amount not greater than $10,000,000 per fiscal year over the 3 years of the term of the grant.

(3) USE.—The grant distributed under this section shall be used exclusively to support project awards pursuant to subsection (e)(1) and (2), pro-

vided that the Consortium may use not more than 10 percent of the amount of such grant for its administrative expenses related to making such awards. The grant made under this section shall not be used for construction of new buildings or facilities, and construction of new buildings or facilities shall not be considered as part of the non-Federal share of a cost sharing agreement under this section.

(4) AUDIT.—The Consortium shall conduct, in accordance with such requirements as the Secretary may prescribe, an annual audit to determine the extent to which a grant distributed to the Consortium under this subsection, and awards under subsection (e), have been utilized in a manner consistent with this section. The auditor shall transmit a report of the results of the audit to the Secretary and to the Government Accountability Office. The Secretary shall include such report in an annual report to Congress, along with a plan to remedy any deficiencies cited in the report. The Government Accountability Office may review such audits as appropriate and shall have full access to the books, records, and personnel of the Consortium to ensure that the grant distributed to the Consortium under this subsection,

and awards made under subsection (e), have been utilized in a manner consistent with this section.

(5) REVOCATION OF AWARDS.—The Secretary shall have authority to review awards made under this subsection and to revoke such awards if the Secretary determines that the Consortium has used the award in a manner not consistent with the requirements of this section.

TITLE VI—DEPARTMENT OF ENERGY

Subtitle A—Office of Science

SEC. 601. SHORT TITLE.

This subtitle may be cited as the ''Department of Energy Office of Science Authorization Act of 2010''.

SEC. 602. DEFINITIONS.

Except as otherwise provided, in this subtitle:

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

(2) DIRECTOR.—The term ''Director'' means the Director of the Office of Science.

(3) OFFICE OF SCIENCE.—The term ''Office of Science'' means the Department of Energy Office of Science.

(4) SECRETARY.—The term ''Secretary'' means the Secretary of Energy.

SEC. 603. MISSION OF THE OFFICE OF SCIENCE.

(a) MISSION.—The mission of the Office of Science shall be the delivery of scientific discoveries, capabilities, and major scientific tools to transform the understanding of nature and to advance the energy, economic, and national security of the United States.

(b) DUTIES.—In support of this mission, the Secretary shall carry out, through the Office of Science, programs on basic energy sciences, biological and environmental research, advanced scientific computing research, fusion energy sciences, high energy physics, and nuclear physics through activities focused on—

(1) Science for Discovery to unravel nature's mysteries through the study of subatomic particles, atoms, and molecules that make up the materials of our everyday world to DNA, proteins, cells, and entire biological systems;

(2) Science for National Need by—

(A) advancing a clean energy agenda through research on energy production, storage, transmission, efficiency, and use; and

(B) advancing our understanding of the Earth's climate through research in atmospheric and environmental sciences and climate change; and

(3) National Scientific User Facilities to deliver the 21st century tools of science, engineering, and technology and provide the Nation's researchers with the most advanced tools of modern science including accelerators, colliders, supercomputers, light sources and neutron sources, and facilities for studying the nanoworld.

(c) SUPPORTING ACTIVITIES.—The activities described in subsection (b) shall include providing for relevant facilities and infrastructure, analysis, coordination, and education and outreach activities.

(d) USER FACILITIES.—The Director shall carry out the construction, operation, and maintenance of user facilities to support the activities described in subsection (b). As practicable, these facilities shall serve the needs of the Department, industry, the academic community, and other relevant entities for the purposes of advancing the missions of the Department.

(e) OTHER AUTHORIZED ACTIVITIES.—In addition to the activities authorized under this subtitle, the Office of Science shall carry out such other activities it is authorized or required to carry out by law.

(f) COORDINATION AND JOINT ACTIVITIES.—The Department's Under Secretary for Science shall ensure the coordination of activities under this subtitle with the

other activities of the Department, and shall support joint activities among the programs of the Department.

(g) DOMESTICALLY SOURCED HARDWARE.—

(1) PLAN.—The Director shall develop a plan to increase the percentage of domestically sourced hardware for planned and ongoing projects of the Office of Science. In developing this plan, the Director shall—

(A) give consideration to technologies that the United States does not currently have the capacity to manufacture and to procurement activities that can strengthen United States high-technology competitiveness broadly;

(B) seek opportunities to engage and partner with domestic manufacturers; and

(C) annually assess levels of domestically available goods relevant to planned and ongoing projects of the Office of Science.

(2) INTERNATIONAL AGREEMENTS.—This subsection shall be applied in a manner consistent with United States obligations under international agreements.

(3) REPORT TO CONGRESS.—Not later than 1 year after the date of enactment of this Act, the Director shall transmit the plan developed under this

subsection to the Committee on Energy and Natural Resources of the Senate and the Committee on Science and Technology of the House of Representatives, and shall transmit any appropriate updates to those committees.

(h) MERIT-REVIEWED STUDY.—As part of the President's annual budget request, the Secretary shall include a detailed summary of the degree to which current research activities are competitive and merit-reviewed, including a list of activities that would have been undertaken in the absence of Congressionally-directed projects and an analysis of the effects of increasing the proportion of competitive, merit-reviewed activities on the strategic objectives of the Office of Science.

SEC. 604. BASIC ENERGY SCIENCES PROGRAM.

(a) PROGRAM.—As part of the activities authorized under section 603, the Director shall carry out a program in basic energy sciences, including materials sciences and engineering, chemical sciences, physical biosciences, and geosciences, for the purpose of providing the scientific foundations for new energy technologies.

(b) BASIC ENERGY SCIENCES USER FACILITIES.—

(1) IN GENERAL.—The Director shall carry out a program for the construction, operation, and maintenance of national user facilities to support the pro-

gram under this section. As practicable, these facilities shall serve the needs of the Department, industry, the academic community, and other relevant entities to create and examine new materials and chemical processes for the purposes of advancing new energy technologies and improving the competitiveness of the United States. These facilities shall include—

(A) x-ray light sources;

(B) neutron sources;

(C) electron beam microcharacterization centers;

(D) nanoscale science research centers; and

(E) other facilities the Director considers appropriate, consistent with section 603(d).

(2) FACILITY CONSTRUCTION AND UPGRADES.—Consistent with the Office of Science's project management practices, the Director shall support construction of—

(A) the National Synchrotron Light Source II;

(B) a Second Target Station at the Spallation Neutron Source; and

(C) an upgrade of the Advanced Photon Source to improve brightness and performance.

(c) ENERGY FRONTIER RESEARCH CENTERS.—

(1) IN GENERAL.—The Director shall carry out a grant program to provide awards, on a competitive, merit-reviewed basis, to multi-institutional collaborations or other appropriate entities to conduct fundamental and use-inspired energy research to accelerate scientific breakthroughs related to needs identified in—

(A) the Grand Challenges report of the Department's Basic Energy Sciences Advisory Committee;

(B) the Basic Energy Sciences Basic Research Needs workshop reports;

(C) energy-related Grand Challenges for Engineering, as described by the National Academy of Engineering; or

(D) other relevant reports identified by the Director.

(2) COLLABORATIONS.—A collaboration receiving a grant under this subsection may include multiple types of institutions and private sector entities.

(3) SELECTION AND DURATION.—

(A) IN GENERAL.—A collaboration under this subsection shall be selected for a period of 5 years.

(B) REAPPLICATION.—After the end of the period described in subparagraph (A), a grantee may reapply for selection for a second period of 5 years on a competitive, merit-reviewed basis.

(4) NO FUNDING FOR CONSTRUCTION.—No funding provided pursuant to this subsection may be used for the construction of new buildings or facilities.

(d) ACCELERATOR RESEARCH AND DEVELOPMENT.—The Director shall carry out research and development on advanced accelerator technologies relevant to the development of Basic Energy Sciences user facilities, in consultation with the Office of Science's High Energy Physics and Nuclear Physics programs.

SEC. 605. BIOLOGICAL AND ENVIRONMENTAL RESEARCH PROGRAM.

(a) IN GENERAL.—As part of the activities authorized under section 603, and coordinated with the activities authorized in section 604, the Director shall carry out a program of research, development, and demonstration in the areas of biological systems science and climate and en-

vironmental science to support the energy and environmental missions of the Department.

(b) BIOLOGICAL SYSTEMS SCIENCE ACTIVITIES.—

(1) ACTIVITIES.—As part of the activities authorized under subsection (a), the Director shall carry out research, development, and demonstration activities in fundamental, structural, computational, and systems biology to increase systems-level understanding of complex biological systems, which shall include activities to—

(A) accelerate breakthroughs and new knowledge that will enable cost-effective sustainable production of—

(i) biomass-based liquid transportation fuels, including hydrogen;

(ii) bioenergy; and

(iii) biobased products,

that support the energy and environmental missions of the Department;

(B) improve understanding of the global carbon cycle, including processes for removing carbon dioxide from the atmosphere, through photosynthesis and other biological processes, for sequestration and storage; and

(C) understand the biological mechanisms used to destroy, immobilize, or remove contaminants from subsurface environments.

(2) RESEARCH PLAN.—

(A) REQUIREMENT.—Not later than 1 year after the date of enactment of this Act, the Director shall prepare and transmit to Congress a research plan describing how the activities authorized under this subsection will be undertaken.

(B) UTILIZATION OF EXISTING PLAN.—In developing the plan in subparagraph (A), the Director may utilize an existing research plan and update such plan to incorporate the activities identified in paragraph (1).

(C) UPDATES.—Not later than 3 years after the initial report under this paragraph, and at least once every 3 years thereafter, the Director shall update the research plan and transmit it to Congress.

(3) BIOENERGY RESEARCH CENTERS.—

(A) IN GENERAL.—In carrying out the activities under paragraph (1), the Director shall support at least 3 bioenergy research centers to accelerate basic biological research, develop-

ment, demonstration, and commercial application of biomass-based liquid transportation fuels, bioenergy, and biobased products that support the energy and environmental missions of the Department and are produced from a variety of regionally diverse feedstocks.

(B) GEOGRAPHIC DISTRIBUTION.—The Director shall ensure that the bioenergy research centers under this paragraph are established in geographically diverse locations.

(C) SELECTION AND DURATION.—A center established under subparagraph (A) shall be selected on a competitive, merit-reviewed basis for a period of 5 years beginning on the date of establishment of that center. A center already in existence on the date of enactment of this Act may continue to receive support for a period of 5 years beginning on the date of establishment of that center.

(4) ENABLING SYNTHETIC BIOLOGY PLAN.—

(A) IN GENERAL.—The Secretary, in consultation with other relevant Federal agencies, the academic community, research-based nonprofit entities, and the private sector, shall develop a comprehensive plan for federally sup-

ported research and development activities that will support the energy and environmental missions of the Department and enable a competitive synthetic biology industry in the United States.

(B) PLAN.—The plan developed under subparagraph (A) shall assess the need to create a database for synthetic biology information, the need and process for developing standards for biological parts, components and systems, and the need for a federally funded facility that enables the discovery, design, development, production, and systematic use of parts, components, and systems created through synthetic biology. The plan shall describe the role of the Federal Government in meeting these needs.

(C) SUBMISSION TO CONGRESS.—The Secretary shall transmit the plan developed under subparagraph (A) to the Congress not later than 9 months after the date of enactment of this Act.

(5) COMPUTATIONAL BIOLOGY AND SYSTEMS BIOLOGY KNOWLEDGEBASE.—As part of the activities described in paragraph (1), the Director, in collaboration with the Advanced Scientific Computing

Research program described in section 606, shall carry out research in computational biology, acquire or otherwise ensure the availability of hardware for biology-specific computation, and establish and maintain an open virtual database and information management system to centrally integrate systems biology data, analytical software, and computational modeling tools that will allow data sharing and free information exchange within the scientific community.

(6) PROHIBITION ON BIOMEDICAL AND HUMAN CELL AND HUMAN SUBJECT RESEARCH.—

(A) NO BIOMEDICAL RESEARCH.—In carrying out activities under subsection (b), the Secretary shall not conduct biomedical research.

(B) LIMITATIONS.—Nothing in subsection (b) shall authorize the Secretary to conduct any research or demonstrations—

(i) on human cells or human subjects; or

(ii) designed to have direct application with respect to human cells or human subjects.

(C) INFORMATION SHARING.—Nothing in this paragraph shall restrict the Department

from sharing information, including research findings, research methodologies, models, or any other information, with any Federal agency.

(7) REPEAL.—Section 977 of the Energy Policy Act of 2005 (42 U.S.C. 16317) is repealed.

(c) CLIMATE AND ENVIRONMENTAL SCIENCES ACTIVITIES.—

(1) IN GENERAL.—As part of the activities authorized under subsection (a), the Director shall carry out climate and environmental science research, which shall include activities to—

(A) understand, observe, and model the response of the Earth's atmosphere and biosphere, including oceans and the Great Lakes, to increased concentrations of greenhouse gas emissions, and any associated changes in climate;

(B) understand the processes for sequestration, destruction, immobilization, or removal of, and understand the movement of, contaminants and carbon in subsurface environments, including at facilities of the Department; and

(C) inform potential mitigation and adaptation options for increased concentrations of

greenhouse gas emissions and any associated changes in climate.

(2) SUBSURFACE BIOGEOCHEMISTRY RESEARCH.—

(A) IN GENERAL.—As part of the activities described in paragraph (1), the Director shall carry out research to advance a fundamental understanding of coupled physical, chemical, and biological processes for controlling the movement of sequestered carbon and subsurface environmental contaminants, including field observations of subsurface microorganisms and field-scale subsurface research.

(B) COORDINATION.—

(i) DIRECTOR.—The Director shall carry out activities under this paragraph in accordance with priorities established by the Department's Under Secretary for Science to support and accelerate the decontamination of relevant facilities managed by the Department.

(ii) UNDER SECRETARY FOR SCIENCE.—The Department's Under Secretary for Science shall ensure the coordination of the activities of the Department,

including activities under this paragraph, to support and accelerate the decontamination of relevant facilities managed by the Department.

(3) NEXT-GENERATION ECOSYSTEM-CLIMATE EXPERIMENT.—

(A) IN GENERAL.—As part of the activities described in paragraph (1), the Director, in collaboration with other relevant agencies that are participants in the United States Global Change Research Program, shall carry out the selection and development of a next-generation ecosystem-climate change experiment to understand the impact and feedbacks of increased temperature and elevated carbon levels on ecosystems.

(B) REPORT.—Not later than 1 year after the date of enactment of this Act, the Director shall transmit to the Congress a report containing—

(i) an identification of the location or locations that have been selected for the experiment described in subparagraph (A);

(ii) a description of the need for additional experiments; and

(iii) an associated research plan.

(4) AMERIFLUX NETWORK COORDINATION AND RESEARCH.—As part of the activities described in paragraph (1), the Director shall carry out research and coordinate the AmeriFlux Network to directly observe and understand the exchange of greenhouse gases, water vapor, and heat energy within terrestrial ecosystems and the response of those systems to climate change and other dynamic terrestrial landscape changes. The Director, in collaboration with other relevant Federal agencies, shall—

(A) identify opportunities to incorporate innovative and emerging observation technologies and practices into the existing Network;

(B) conduct research to determine the need for increased greenhouse gas observation Network facilities across North America to meet future mitigation and adaptation needs of the United States; and

(C) examine how the technologies and practices described in subparagraph (A), and increased coordination among scientific communities through the Network, have the potential to help characterize terrestrial baseline green-

house gas emission sources and sinks in the United States and internationally.

(5) CLIMATE AND EARTH MODELING.—As part of the activities described in paragraph (1), the Director, in collaboration with the Advanced Scientific Computing Research program described in section 606, shall carry out research to develop, evaluate, and use high-resolution regional climate, global climate, Earth, and predictive models to inform decisions on reducing the impacts of changing climate.

(6) INTEGRATED ASSESSMENT RESEARCH.—As part of the activities described in paragraph (1), the Director shall carry out research into options for mitigation of and adaptation to climate change through multiscale models of the entire climate system. Such modeling shall include human processes and greenhouse gas emissions, land use, and interaction among human and Earth systems.

(7) COORDINATION.—The Director shall coordinate activities under this subsection with other Office of Science activities and with the United States Global Change Research Program.

(d) USER FACILITIES AND ANCILLARY EQUIPMENT.—

(1) IN GENERAL.—The Director shall carry out a program for the construction, operation, and maintenance of user facilities to support the program under this section. As practicable, these facilities shall serve the needs of the Department, industry, the academic community, and other relevant entities.

(2) INCLUDED FUNCTIONS.—User facilities described in paragraph (1) shall include facilities which carry out—

(A) genome sequencing and analysis of plants, microbes, and microbial communities using high throughput tools, technologies, and comparative analysis;

(B) molecular level research in biological, chemical, environmental, and subsurface sciences, including synthesis, dynamic properties, and interactions among natural and engineered materials; and

(C) measurement of cloud and aerosol properties used for examining atmospheric processes and evaluating climate model performance, including ground stations at various locations, mobile resources, and aerial vehicles.

SEC. 606. ADVANCED SCIENTIFIC COMPUTING RESEARCH PROGRAM.

(a) IN GENERAL.—As part of the activities authorized under section 603, the Director shall carry out a research, development, demonstration, and commercial application program to advance computational and networking capabilities to analyze, model, simulate, and predict complex phenomena relevant to the development of new energy technologies and the competitiveness of the United States.

(b) COORDINATION.—

(1) DIRECTOR.—The Director shall carry out activities under this section in accordance with priorities established by the Department's Under Secretary for Science to determine and meet the computational and networking research and facility needs of the Office of Science and all other relevant energy technology and energy efficiency programs within the Department.

(2) UNDER SECRETARY FOR SCIENCE.—The Department's Under Secretary for Science shall ensure the coordination of the activities of the Department, including activities under this section, to determine and meet the computational and networking research and facility needs of the Office of Science

and all other relevant energy technology and energy efficiency programs within the Department.

(c) RESEARCH TO SUPPORT ENERGY APPLICATIONS.—As part of the activities authorized under subsection (a), the program shall support research in high-performance computing and networking relevant to energy applications, including both basic and applied energy research programs carried out by the Secretary.

(d) REPORTS.—

(1) ADVANCED COMPUTING FOR ENERGY APPLICATIONS.—Not later than one year after the date of enactment of this Act, the Secretary shall transmit to the Congress a plan to integrate and leverage the expertise and capabilities of the program described in subsection (a), as well as other relevant computational and networking research programs and resources supported by the Federal Government, to advance the missions of the Department's applied energy and energy efficiency programs, including the development of smart grid technologies.

(2) EXASCALE COMPUTING.—At least 18 months prior to the initiation of construction or installation of any exascale-class computing facility, the Secretary shall transmit a plan to the Congress detailing—

(A) the proposed facility's cost projections and capabilities to significantly accelerate the development of new energy technologies;

(B) technical risks and challenges that must be overcome to achieve successful completion and operation of the facility; and

(C) an assessment of the scientific and technological advances expected from such a facility relative to those expected from a comparable investment in expanded research and applications at terascale-class and petascale-class computing facilities.

(e) APPLIED MATHEMATICS AND SOFTWARE DEVELOPMENT FOR HIGH-END COMPUTING SYSTEMS.—The Director shall carry out activities to develop, test, and support mathematics, models, and algorithms for complex systems, as well as programming environments, tools, languages, and operating systems for high-end computing systems (as defined in section 2 of the Department of Energy High-End Computing Revitalization Act of 2004 (15 U.S.C. 5541)).

(f) HIGH-END COMPUTING FACILITIES.—The Director shall—

(1) provide for sustained access by the public and private research community in the United

States to high-end computing systems, including access to the National Energy Research Scientific Computing Center and to Leadership Systems (as defined in section 2 of the Department of Energy High-End Computing Revitalization Act of 2004 (15 U.S.C. 5541));

(2) provide technical support for users of such systems; and

(3) conduct research and development on next-generation computing architectures and platforms to support the missions of the Department.

(g) OUTREACH.—The Secretary shall conduct outreach programs and may form partnerships to increase the use of and access to high-performance computing modeling and simulation capabilities by industry, including manufacturers.

SEC. 607. FUSION ENERGY RESEARCH PROGRAM.

(a) PROGRAM.—As part of the activities authorized under section 603, the Director shall carry out a fusion energy sciences research and enabling technology development program to effectively address the scientific and engineering challenges to building a cost-competitive fusion power plant and a competitive fusion power industry in the United States. As part of this program, the Director shall carry out research activities to expand the funda-

mental understanding of plasmas and matter at very high temperatures and densities.

(b) ITER.—The Director shall coordinate and carry out the responsibilities of the United States with respect to the ITER international fusion project pursuant to the Agreement on the Establishment of the ITER International Fusion Energy Organization for the Joint Implementation of the ITER Project.

(c) IDENTIFICATION OF PRIORITIES.—Not later than 18 months after the date of enactment of this Act, the Secretary shall transmit to the Congress a report on the Department's proposed research and development activities in magnetic fusion over the 10 years following the date of enactment of this Act under four realistic budget scenarios. The report shall—

(1) identify specific areas of fusion energy research and enabling technology development in which the United States can and should establish or solidify a lead in the global fusion energy development effort; and

(2) identify priorities for initiation of facility construction and facility decommissioning under each of those scenarios.

(d) FUSION MATERIALS RESEARCH AND DEVELOPMENT.—The Director, in coordination with the Assistant

Secretary for Nuclear Energy of the Department, shall carry out research and development activities to identify, characterize, and create materials that can endure the neutron, plasma, and heat fluxes expected in a commercial fusion power plant. As part of the activities authorized under subsection (c), the Secretary shall—

(1) provide an assessment of the need for a facility or facilities that can examine and test potential fusion and next generation fission materials and other enabling technologies relevant to the development of commercial fusion power plants; and

(2) provide an assessment of whether a single new facility that substantially addresses magnetic fusion, inertial fusion, and next generation fission materials research needs is feasible, in conjunction with the expected capabilities of facilities operational as of the date of enactment of this Act.

(e) ENABLING TECHNOLOGY DEVELOPMENT.—The Secretary shall carry out activities to develop technologies necessary to enable the reliable, sustainable, safe, and economically competitive operation of a commercial fusion power plant.

(f) FUSION SIMULATION PROJECT.—In collaboration with the Office of Science's Advanced Scientific Computing Research program described in section 606, the Di-

rector shall carry out a computational project to advance the capability of fusion researchers to accurately simulate an entire fusion energy system.

(g) INERTIAL FUSION ENERGY RESEARCH AND DEVELOPMENT PROGRAM.—The Secretary shall carry out a program of research and technology development in inertial fusion for energy applications, including ion beam and laser fusion. Not later than 180 days after the release of a report from the National Academies on inertial fusion energy research, the Secretary shall transmit to Congress a report describing the Department's plan to incorporate any relevant recommendations from the National Academies' report into this program.

SEC. 608. HIGH ENERGY PHYSICS PROGRAM.

(a) PROGRAM.—As part of the activities authorized under section 603, the Director shall carry out a research program on the elementary constituents of matter and energy and the nature of space and time.

(b) NEUTRINO RESEARCH.—As part of the program described in subsection (a), the Director shall carry out research activities on rare decay processes and the nature of the neutrino, which may—

(1) include collaborations with the National Science Foundation on relevant projects; and

(2) utilize components of existing accelerator facilities to produce neutrino beams of sufficient intensity to explore research priorities identified by the High Energy Physics Advisory Panel or the National Academy of Sciences.

(c) DARK ENERGY AND DARK MATTER RESEARCH.—As part of the program described in subsection (a), the Director shall carry out research activities on the nature of dark energy and dark matter. These activities shall be consistent with research priorities identified by the High Energy Physics Advisory Panel or the National Academy of Sciences, and may include—

(1) the development of space-based and land-based facilities and experiments; and

(2) collaborations with the National Aeronautics and Space Administration, the National Science Foundation, or international collaborations on relevant research projects.

(d) ACCELERATOR RESEARCH AND DEVELOPMENT.—The Director shall carry out research and development in advanced accelerator concepts and technologies to reduce the necessary scope and cost for the next generation of particle accelerators.

(e) INTERNATIONAL COLLABORATION.—The Director, as practicable and in coordination with other appro-

priate Federal agencies as necessary, shall ensure the access of United States researchers to the most advanced accelerator facilities and research capabilities in the world, including the Large Hadron Collider.

SEC. 609. NUCLEAR PHYSICS PROGRAM.

(a) PROGRAM.—As part of the activities authorized under section 603, the Director shall carry out a research program, and support relevant facilities, to discover and understand various forms of nuclear matter.

(b) FACILITY CONSTRUCTION AND UPGRADES.—Consistent with the Office of Science's project management practices, the Director shall carry out—

(1) an upgrade of the Continuous Electron Beam Accelerator Facility to a 12 gigaelectronvolt beam of electrons; and

(2) construction of the Facility for Rare Isotope Beams.

(c) ISOTOPE DEVELOPMENT AND PRODUCTION FOR RESEARCH APPLICATIONS.—The Director shall carry out a program for the production of isotopes, including the development of techniques to produce isotopes, that the Secretary determines are needed for research, excluding medical research. In making this determination, the Secretary shall consider any relevant recommendations made by Federal advisory committees, the National Academies,

and interagency working groups in which the Department participates.

SEC. 610. SCIENCE LABORATORIES INFRASTRUCTURE PROGRAM.

(a) PROGRAM.—The Director shall carry out a program to improve the safety, efficiency, and mission readiness of infrastructure at Office of Science laboratories. The program shall include projects to—

(1) renovate or replace space that does not meet research needs;

(2) replace facilities that are no longer cost effective to renovate or operate;

(3) modernize utility systems to prevent failures and ensure efficiency;

(4) remove excess facilities to allow safe and efficient operations; and

(5) construct modern facilities to conduct advanced research in controlled environmental conditions.

(b) MINOR CONSTRUCTION PROJECTS.—

(1) AUTHORITY.—Using operation and maintenance funds or facilities and infrastructure funds authorized by law, the Secretary may carry out minor construction projects with respect to laboratories administered by the Office of Science.

(2) ANNUAL REPORT.—The Secretary shall submit to Congress, as part of the annual budget submission of the Department, a report on each exercise of the authority under subsection (a) during the preceding fiscal year. Each report shall include a summary of maintenance and infrastructure needs and associated funding requirements at each of the laboratories, including the amount of both planned and deferred infrastructure spending at each laboratory. Each report shall provide a brief description of each minor construction project covered by the report.

(3) COST VARIATION REPORTS.—If, at any time during the construction of any minor construction project, the estimated cost of the project is revised and the revised cost of the project exceeds the minor construction threshold, the Secretary shall immediately submit to Congress a report explaining the reasons for the cost variation.

(4) DEFINITIONS.—In this section—

(A) the term ''minor construction project'' means any plant project not specifically authorized by law for which the approved total estimated cost does not exceed the minor construction threshold; and

(B) the term ''minor construction threshold'' means $10,000,000, with such amount to be adjusted by the Secretary in accordance with the Engineering News-Record Construction Cost Index, or an appropriate alternative index as determined by the Secretary, once every five years after the date of enactment of this Act.

(5) NONAPPLICABILITY.—Sections 4703 and 4704 of the Atomic Energy Defense Act (50 U.S.C. 2743 and 2744) shall not apply to laboratories administered by the Office of Science.

SEC. 611. AUTHORIZATION OF APPROPRIATIONS.

There are authorized to be appropriated to the Secretary for the activities of the Office of Science—

(1) $5,247,000,000 for fiscal year 2011, of which—

(A) $1,875,000,000 shall be for Basic Energy Sciences activities under section 604;

(B) $667,000,000 shall be for Biological and Environmental Research activities under section 605; and

(C) $466,000,000 shall be for Advanced Scientific Computing Research activities under section 606;

(2) $5,614,000,000 for fiscal year 2012, of which—

(A) $2,025,000,000 shall be for Basic Energy Sciences activities under section 604;

(B) $720,000,000 shall be for Biological and Environmental Research activities under section 605; and

(C) $503,000,000 shall be for Advanced Scientific Computing Research activities under section 606;

(3) $6,007,000,000 for fiscal year 2013, of which—

(A) $2,187,000,000 shall be for Basic Energy Sciences activities under section 604;

(B) $778,000,000 shall be for Biological and Environmental Research activities under section 605; and

(C) $544,000,000 shall be for Advanced Scientific Computing Research activities under section 606;

(4) $6,428,000,000 for fiscal year 2014, of which—

(A) $2,362,000,000 shall be for Basic Energy Sciences activities under section 604;

(B) $840,000,000 shall be for Biological and Environmental Research activities under section 605; and

(C) $587,000,000 shall be for Advanced Scientific Computing Research activities under section 606; and

(5) $6,878,000,000 for fiscal year 2015, of which—

(A) $2,551,000,000 shall be for Basic Energy Sciences activities under section 604;

(B) $907,000,000 shall be for Biological and Environmental Research activities under section 605; and

(C) $634,000,000 shall be for Advanced Scientific Computing Research activities under section 606.

Subtitle B—Advanced Research Projects Agency-Energy

SEC. 621. SHORT TITLE.

This subtitle may be cited as the ''ARPA-E Reauthorization Act of 2010''.

SEC. 622. ARPA-E AMENDMENTS.

Section 5012 of the America COMPETES Act (42 U.S.C. 16538) is amended—

(1) in subsection (c)(2)—

(A) in subparagraph (A), by inserting ''and applied'' after ''advances in fundamental'';

(B) by striking ''and'' at the end of subparagraph (B);

(C) by striking the period at the end of subparagraph (C) and inserting ''; and''; and

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

''(D) promoting the commercial application of advanced energy technologies.'';

(2) in subsection (e)(3), by amending subparagraph (C) to read as follows:

''(C) research and development of advanced manufacturing process and technologies for the domestic manufacturing of novel energy technologies; and'';

(3) in subsection (e)—

(A) by striking ''and'' at the end of paragraph (3)(D);

(B) by striking the period at the end of paragraph (4) and inserting ''; and''; and

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

''(5) pursuant to subsection (c)(2)(C)—

''(A) ensuring that applications for funding disclose the extent of current and prior efforts, including monetary investments as appropriate, in pursuit of the technology area for which funding is being requested;

''(B) adopting measures to ensure that, in making awards, program managers adhere to the objectives in subsection (c)(2)(C); and

''(C) providing as part of the annual report required by subsection (h)(1) a summary of the instances of and reasons for ARPA-E funding projects in technology areas already being undertaken by industry.'';

(4) by redesignating subsections (f) through (m) as subsections (g), (h), (i), (j), (l), (m), (n), and (o), respectively;

(5) by inserting after subsection (e) the following new subsection:

''(f) AWARDS.—In carrying out this section, the Director may initiate and execute awards in the form of grants, contracts, cooperative agreements, cash prizes, and other transactions. The Director shall make awards designed to overcome the long-term and high-risk barriers relating to the goals and means set forth in subsection (c) and facilitate submissions, where possible by small

businesses and entrepreneurs, pursuant to announcements published not less frequently than annually, of funding opportunities for—

''(1) specific areas of technological innovation; and

''(2) broadly defined areas of science and technology,

to remain open for periods of one year.'';

(6) in subsection (g), as so redesignated by paragraph (4) of this section—

(A) by redesignating paragraphs (1) and (2) as paragraphs (2) and (3), respectively;

(B) by inserting before paragraph (2), as so redesignated by subparagraph (A) of this paragraph, the following new paragraph:

''(1) IN GENERAL.—The Director shall establish and maintain within ARPA-E a staff with sufficient qualifications and expertise to enable ARPA-E to carry out its responsibilities under this section in conjunction with the operations of the rest of the Department.'';

(C) in paragraph (2)(A), as so redesignated by subparagraph (A) of this paragraph—

(i) in the paragraph heading, by striking ''PROGRAM MANAGERS'' and inserting ''PROGRAM DIRECTORS'';

(ii) by striking ''program managers'' and inserting ''program directors''; and

(iii) by striking ''each of''.

(D) in paragraph (2)(B), as so redesignated by subparagraph (A) of this paragraph—

(i) by striking ''program manager'' and inserting ''program director'';

(ii) in clause (iv), by striking '', with advice under subsection (j) as appropriate,'';

(iii) by redesignating clauses (v) and (vi) as clauses (vi) and (viii), respectively;

(iv) by inserting after clause (iv) the following new clause:

''(v) identifying innovative cost-sharing arrangements for ARPA-E projects, including through use of the authority under section 988(b)(3) of the Energy Policy Act of 2005 (42 U.S.C. 16352(b)(3));'';

(v) in clause (vi), as so redesignated by clause (iii) of this subparagraph, by

striking ''; and'' and inserting a semicolon; and

(vi) by inserting after clause (vi), as so redesignated by clause (iii) of this subparagraph, the following new clause:

''(vii) identifying mechanisms for commercial application of successful energy technology development projects, including through establishment of partnerships between awardees and commercial entities; and'';

(E) in paragraph (2)(C), as so redesignated by subparagraph (A) of this paragraph, by inserting ''up to'' after ''shall be'';

(F) in paragraph (3)(B), as so redesignated by subparagraph (A) of this paragraph, by striking ''not less than 70, and not more than 120,'' and inserting ''not more than 120''; and

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

''(4) FELLOWSHIPS.—The Director is authorized to select exceptional early-career and senior scientific, legal, business, and technical personnel to serve as fellows to work at ARPA-E for terms not

to exceed two years. Responsibilities of fellows may include—

''(A) supporting program directors in program creation, design, implementation, and management;

''(B) exploring technical fields for future ARPA-E program areas;

''(C) assisting the Director in the creation of the strategic vision for ARPA-E referred to in subsection (h)(2);

''(D) preparing energy technology and economic analyses; and

''(E) any other appropriate responsibilities identified by the Director.'';

(7) in subsection (h)(2), as so redesignated by paragraph (4) of this section—

(A) by striking ''2008'' and inserting ''2010''; and

(B) by striking ''2011'' and inserting ''2013'';

(8) by amending subsection (j), as so redesignated by paragraph (4) of this section, to read as follows:

''(j) FEDERAL DEMONSTRATION OF TECHNOLOGIES.—The Director shall seek opportunities to part-

ner with purchasing and procurement programs of Federal agencies to demonstrate energy technologies resulting from activities funded through ARPA-E.'';

(9) by inserting after such subsection (j) the following new subsection:

''(k) EVENTS.—

''(1) The Director is authorized to convene, organize, and sponsor events that further the objectives of ARPA-E, including events that assemble awardees, the most promising applicants for ARPA-E funding, and a broad range of ARPA-E stakeholders (which may include members of relevant scientific research and academic communities, government officials, financial institutions, private investors, entrepreneurs, and other private entities), for the purposes of—

''(A) demonstrating projects of ARPA-E awardees;

''(B) demonstrating projects of finalists for ARPA-E awards and other energy technology projects;

''(C) facilitating discussion of the commercial application of energy technologies developed under ARPA-E and other government-sponsored research and development programs; or

''(D) such other purposes as the Director considers appropriate.

''(2) Funding for activities described in paragraph (1) shall be provided as part of the technology transfer and outreach activities authorized under subsection (o)(4)(B).'';

(10) in subsection (m)(1), as so redesignated by paragraph (4) of this section, by striking ''4 years'' and inserting ''6 years'';

(11) in subsection (m)(2)(B), as so redesignated by paragraph (4) of this section, by inserting '', and how those lessons may apply to the operation of other programs within the Department of Energy'' after ''ARPA-E'';

(12) by amending subsection (o)(2), as so redesignated by paragraph (4) of this section, to read as follows:

''(2) AUTHORIZATION OF APPROPRIATIONS.—Subject to paragraph (4), there are authorized to be appropriated to the Director for deposit in the Fund, without fiscal year limitation—

''(A) $300,000,000 for fiscal year 2011;

''(B) $450,000,000 for fiscal year 2012;

''(C) $600,000,000 for fiscal year 2013;

''(D) $800,000,000 for fiscal year 2014; and

''(E) $1,000,000,000 for fiscal year 2015.'';

(13) in subsection (o), as so redesignated by paragraph (4) of this section, by—

(A) striking paragraph (4); and

(B) redesignating paragraph (5) as paragraph (4); and

(14) in subsection (o)(4)(B), as so redesignated by paragraphs (4) and (13)(B) of this subsection—

(A) by striking ''2.5 percent'' and inserting ''5 percent''; and

(B) by inserting '', consistent with the goal described in subsection (c)(2)(D) and within the responsibilities of program directors as specified in subsection (g)(2)(B)(vii)'' after ''outreach activities''.

Subtitle C—Energy Innovation Hubs

SEC. 631. SHORT TITLE.

This subtitle may be cited as the ''Energy Innovation Hubs Authorization Act of 2010''.

SEC. 632. ENERGY INNOVATION HUBS.

(a) ESTABLISHMENT OF PROGRAM.—

(1) IN GENERAL.—The Secretary of Energy shall carry out a program to enhance the Nation's economic, environmental, and energy security by making grants to consortia for establishing and operating Energy Innovation Hubs to conduct and support, whenever practicable at one centralized location, multidisciplinary, collaborative research, development, demonstration, and commercial application of advanced energy technologies in areas not being served by the private sector.

(2) TECHNOLOGY DEVELOPMENT FOCUS.—The Secretary shall designate for each Hub a unique advanced energy technology development focus.

(3) COORDINATION.—The Secretary shall ensure the coordination of, and avoid unnecessary duplication of, the activities of Hubs with those of other Department of Energy research entities, including the National Laboratories, the Advanced Research Projects Agency—Energy, and Energy Frontier Research Centers, and within industry. Such coordination shall include convening and consulting with representatives of staff of the Department of Energy, representatives from Hubs and the qualifying entities that are members of the consortia operating the Hubs, and representatives of such other

entities as the Secretary considers appropriate, to share research results, program plans, and opportunities for collaboration.

(4) ADMINISTRATION.—The Secretary shall administer this section with respect to each Hub through the Department program office appropriate to administer the subject matter of the technology development focus assigned under paragraph (2) for the Hub.

(b) CONSORTIA.—

(1) ELIGIBILITY.—To be eligible to receive a grant under this section for the establishment and operation of a Hub, a consortium shall—

(A) be composed of no fewer than 2 qualifying entities;

(B) operate subject to a binding agreement entered into by its members that documents—

(i) the proposed partnership agreement, including the governance and management structure of the Hub;

(ii) measures to enable cost-effective implementation of the program under this section;

(iii) a proposed budget, including financial contributions from non-Federal sources;

(iv) conflict of interest procedures consistent with subsection (d)(3), all known material conflicts of interest, and corresponding mitigation plans;

(v) an accounting structure that enables the Secretary to ensure that the consortium has complied with the requirements of this section; and

(vi) an external advisory committee consistent with subsection (d)(2); and

(C) operate as a nonprofit organization.

(2) APPLICATION.—A consortium seeking to establish and operate a Hub under this section, acting through a prime applicant, shall transmit to the Secretary an application at such time, in such form, and accompanied by such information as the Secretary shall require, including a detailed description of the elements of the consortium agreement required under paragraph (1)(B). If the consortium members will not be located at one centralized location, such application shall include a communica-

tions plan that ensures close coordination and integration of the Hub's activities.

(c) SELECTION AND SCHEDULE.—The Secretary shall select consortia for grants for the establishment and operation of Hubs through competitive selection processes. In selecting consortia, the Secretary shall consider the information a consortium must disclose according to subsection (b), as well as any existing facilities a consortium will provide for Hub activities. Grants made to a Hub shall be for a period not to exceed 5 years, after which the grant may be renewed, subject to a competitive selection process.

(d) HUB OPERATIONS.—

(1) IN GENERAL.—Hubs shall conduct or provide for multidisciplinary, collaborative research, development, demonstration, and commercial application of advanced energy technologies within the technology development focus designated for the Hub by the Secretary under subsection (a)(2). Each Hub shall—

(A) encourage collaboration and communication among the member qualifying entities of the consortium and awardees by conducting activities whenever practicable at one centralized location;

(B) develop and publish on the Department of Energy's website proposed plans and programs;

(C) submit an annual report to the Secretary summarizing the Hub's activities, including detailing organizational expenditures, listing external advisory committee members, and describing each project undertaken by the Hub; and

(D) monitor project implementation and coordination.

(2) EXTERNAL ADVISORY COMMITTEE.—Each Hub shall establish an external advisory committee, the membership of which shall have sufficient expertise to advise and provide guidance on scientific, technical, industry, financial, and research management matters.

(3) CONFLICTS OF INTEREST.—

(A) PROCEDURES.—Hubs shall establish conflict of interest procedures, consistent with those of the Department of Energy, to ensure that employees and consortia designees for Hub activities who are in decisionmaking capacities disclose all material conflicts of interest, includ-

ing financial, organizational, and personal conflicts of interest.

(B) DISQUALIFICATION AND REVOCATION.—The Secretary may disqualify an application or revoke funds distributed to a Hub if the Secretary discovers a failure to comply with conflict of interest procedures established under subparagraph (A).

(e) PROHIBITION ON CONSTRUCTION.—

(1) IN GENERAL.—No funds provided pursuant to this section may be used for construction of new buildings or facilities for Hubs. Construction of new buildings or facilities shall not be considered as part of the non-Federal share of a Hub cost-sharing agreement.

(2) TEST BED AND RENOVATION EXCEPTION.—Nothing in this subsection shall prohibit the use of funds provided pursuant to this section, or non-Federal cost share funds, for the construction of a test bed or renovations to existing buildings or facilities for the purposes of research if the Oversight Board determines that the test bed or renovations are limited to a scope and scale necessary for the research to be conducted.

(f) OVERSIGHT BOARD.—The Secretary shall establish and maintain within the Department an Oversight Board to oversee the progress of Hubs.

(g) PRIORITY CONSIDERATION.—The Secretary shall give priority consideration to applications in which 1 or more of the institutions under subsection (b)(1)(A) are 1890 Land Grant Institutions (as defined in section 2 of the Agricultural Research, Extension, and Education Reform Act of 1998 (7 U.S.C. 7061)), Predominantly Black Institutions (as defined in section 318 of the Higher Education Act of 1965 (20 U.S.C. 1059e)), Tribal Colleges or Universities (as defined in section 316(b) of the Higher Education Act of 1965 (20 U.S.C. 1059c(b)), or Hispanic Serving Institutions (as defined in section 318 of the Higher Education Act of 1965 (20 U.S.C. 1059e)).

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

(1) ADVANCED ENERGY TECHNOLOGY.—The term ''advanced energy technology'' means an innovative technology—

(A) that produces energy from solar, wind, geothermal, biomass, tidal, wave, ocean, or other renewable energy resources;

(B) that produces nuclear energy;

(C) for carbon capture and sequestration;

(D) that enables advanced vehicles, vehicle components, and related technologies that result in significant energy savings;

(E) that generates, transmits, distributes, utilizes, or stores energy more efficiently than conventional technologies, including through Smart Grid technologies; or

(F) that enhances the energy independence and security of the United States by enabling improved or expanded supply and production of domestic energy resources, including coal, oil, and natural gas.

(2) HUB.—The term ''Hub'' means an Energy Innovation Hub established in accordance with this section.

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

(4) QUALIFYING ENTITY.—The term ''qualifying entity'' means—

(A) an institution of higher education;

(B) an appropriate State or Federal entity, including the Department of Energy Federally Funded Research and Development Centers;

(C) a nongovernmental organization with expertise in advanced energy technology research, development, demonstration, or commercial application; or

(D) any other relevant entity the Secretary considers appropriate.

(5) SECRETARY.—The term ''Secretary'' means the Secretary of Energy.

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

(1) $110,000,000 for fiscal year 2011;

(2) $135,000,000 for fiscal year 2012;

(3) $195,000,000 for fiscal year 2013;

(4) $210,000,000 for fiscal year 2014; and

(5) $210,000,000 for fiscal year 2015.

Subtitle D—Cooperative Research and Development Fund

SEC. 641. SHORT TITLE.

This subtitle may be cited as the ''Cooperative Research and Development Fund Authorization Act of 2010''.

SEC. 642. COOPERATIVE RESEARCH AND DEVELOPMENT FUND.

(a) IN GENERAL.—The Secretary of Energy shall make funds available to Department of Energy National Laboratories for the Federal share of cooperative research and development agreements. The Secretary of Energy shall determine the apportionment of such funds to each Department of Energy National Laboratory and shall ensure that special consideration is given to small business firms and consortia involving small business firms in the selection process for which cooperative research and development agreements will receive such funds.

(b) REPORTING.—Each year the Secretary shall submit to Congress a report that describes how funds were expended under this subtitle.

(c) AUTHORIZATION OF APPROPRIATIONS.—There are authorized to be appropriated to the Secretary such sums as are necessary to carry out this section each fiscal year. No funds allocated for this section shall come from funds allocated for the Office of Science.

Subtitle E—Technology Transfer Database

SEC. 651. TECHNOLOGY TRANSFER DATABASE.

To support the commercial application of new energy technologies development by the Department of Energy, the Secretary of Energy may establish an online database

of technologies, capabilities, and resources available to the public at the National Laboratories.

TITLE VII—MISCELLANEOUS

SEC. 701. SENSE OF CONGRESS.

It is the sense of Congress that, among the programs and activities authorized in this Act, those that correspond to the recommendations of the National Academy of Sciences' 2005 report entitled ''Rising Above the Gathering Storm'' remain critical to maintaining long-term United States economic competitiveness, and accordingly shall receive funding priority.

SEC. 702. PERSONS WITH DISABILITIES.

For the purposes of the activities and programs supported by this Act and the amendments made by this Act—

(1) institutions of higher education chartered to serve large numbers of students with disabilities, including Gallaudet University, Landmark College, and the National Technical Institute for the Deaf, and institutions of higher education offering science, technology, engineering, and mathematics research and education activities and programs that serve veterans with disabilities, shall receive special consideration in the review of any proposals by these institutions for funding under the research and edu-

cation programs authorized in this Act to ensure that institutions of higher education chartered to or serving persons with disabilities benefit from such research and education activities and programs; and

(2) agencies with respect to which appropriations are authorized under this Act shall also conduct outreach to veterans with disabilities pursuing studies in science, technology, engineering, and mathematics to ensure that such veterans are aware of and benefit from the research and education activities and programs authorized by this Act.

SEC. 703. VETERANS AND SERVICE MEMBERS.

In awarding scholarships and fellowships under this Act, an institution of higher education shall give preference to applications from veterans and service members, including those who have received or will receive the Afghanistan Campaign Medal or the Iraq Campaign Medal as authorized by Public Law 108–234 (10 U.S.C. 1121 note; 118 Stat. 655) and Executive Order No. 13363.

SEC. 704. BUDGETARY EFFECTS.

The budgetary effects of this Act, for the purpose of complying with the Statutory Pay-As-You-Go Act of 2010, shall be determined by reference to the latest statement titled ''Budgetary Effects of PAYGO Legislation'' for this Act, submitted for printing in the Congressional Record

by the Chairman of the House Budget Committee, provided that such statement has been submitted prior to the vote on passage.

SEC. 705. LIMITATION.

No funds authorized under this Act shall be used for the employment of, or shall be received by, any individual who has been convicted of, or pleaded guilty to, a crime of child molestation, rape, or any other form of sexual assault.

SEC. 706. PROHIBITION ON LOBBYING.

Nothing in this Act shall be construed to supercede section 1913 of title 18, United States Code.

SEC. 707. INFORMATION REQUESTS BY LABOR ORGANIZATIONS.

(a) ELIGIBILITY FOR FUNDS.—Notwithstanding any other provision of this Act, a public institution of higher education that employs employees who are represented by a labor organization and perform work on an activity or program supported by this Act or an amendment made by this Act shall be eligible to receive funding for facilities and administrative costs for any activity or program supported by this Act or the amendments made by this Act only if the institution maintains a policy that meets the requirements set forth in subsection (b).

(b) REQUIREMENTS.—A policy described under subsection (a) shall require that the institution provide, within 15 days of receipt of a request by a labor organization representing the employees of the institution described in subsection (a), any information which the labor organization has a lawful right to obtain under applicable labor laws. Such a policy shall provide that, on a case-by-case basis, such 15 days may be extended to a longer time period by mutual agreement of the labor organization and the institution.

(c) FAILURE TO COMPLY WITH POLICY.—

(1) COMPLAINT OF NONCOMPLIANCE.—In the case of an institution of higher education that does not provide information requested by a labor organization in compliance with the requirements of a policy described in subsections (a) and (b), the labor organization may file a complaint of noncompliance with the head of the agency overseeing any activity or program supported by this Act or the amendments made by this Act for which the institution is receiving funds.

(2) NOTIFICATION TO INSTITUTION.—Upon receiving such a complaint, the head of such agency shall notify the institution of the complaint and provide the institution an additional 30 days to provide

the requested information to the labor organization or otherwise explain why the complaint of non-compliance is not valid.

(3) AGENCY ACTION.—If the information has not been provided by the institution at the conclusion of such 30 day period and the head of such agency determines the complaint to be valid, the head of such agency shall suspend payment of any funds for facilities and administrative costs that would otherwise be available to such institution for all activities and programs supported by this Act and the amendments made by this Act until such time as the requested information has been provided by the institution.

(d) DEFINITIONS.—For purposes of this section—

(1) the term ''institution of higher education'' has the meaning given such term in section 101(a) of the Higher Education Act of 1965 (20 U.S.C. 1001(a)), except that such term does not include a private institution of higher education; and

(2) the term ''facilities and administrative costs'' means facilities and administrative (F&A) costs as defined in the Office of Management and Budget Revised Circular A–21 (Cost Principles for

Educational Institutions, published in the Federal Register on May 10, 2004).

(e) EFFECTIVE DATE.—This section shall take effect on January 1, 2011.

SEC. 708. LIMITATION.

No funds authorized to be appropriated by this Act or the amendments made by this Act may be used to purchase gift items, knickknacks, souvenirs, trinkets, or other items without direct educational value.

SEC. 709. NO SALARIES FOR VIEWING PORNOGRAPHY.

None of the funds authorized under this Act may be used to pay the salary of any individual who has been officially disciplined for violations of subpart G of the Standards of Ethical Conduct for Employees of the Executive Branch for viewing, downloading, or exchanging pornography, including child pornography, on a Federal Government computer or while performing official Federal Government duties.

SEC. 710. INELIGIBILITY FOR AWARDS OR GRANTS.

None of the funds authorized under this Act shall be available to make awards to or provide grants for an institution of higher education under this Act if that institution is prevented from receiving funds for contracts or

grants for education under section 983 of title 10, United States Code.

Passed the House of Representatives May 28, 2010.

Attest:

Clerk.

111TH CONGRESS
2D SESSION

H. R. 5116

AN ACT

To invest in innovation through research and development, to improve the competitiveness of the United States, and for other purposes.