

113TH CONGRESS  
2D SESSION

# H. R. 4159

To provide for investment in innovation through research and development and STEM education, to improve the competitiveness of the United States, and for other purposes.

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## IN THE HOUSE OF REPRESENTATIVES

MARCH 6, 2014

Ms. EDDIE BERNICE JOHNSON of Texas (for herself, Mr. GEORGE MILLER of California, Mr. HOYER, Ms. LOFGREN, Mr. LIPINSKI, Ms. EDWARDS, Ms. WILSON of Florida, Ms. BONAMICI, Mr. SWALWELL of California, Mr. MAFFEI, Mr. GRAYSON, Mr. KENNEDY, Mr. PETERS of California, Mr. KILMER, Mr. BERA of California, Ms. ESTY, Mr. VEASEY, Ms. BROWNLEY of California, Mr. TAKANO, and Ms. KELLY of Illinois) introduced the following bill; which was referred to the Committee on Science, Space, and Technology, and in addition to the Committee on Education and the Workforce, for a period to be subsequently determined by the Speaker, in each case for consideration of such provisions as fall within the jurisdiction of the committee concerned

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## A BILL

To provide for investment in innovation through research and development and STEM education, to improve the competitiveness of the United States, and for other purposes.

1       *Be it enacted by the Senate and House of Representa-*  
2       *tives of the United States of America in Congress assembled,*

1 **SECTION 1. SHORT TITLE; TABLE OF CONTENTS.**

2 (a) SHORT TITLE.—This Act may be cited as the  
 3 “America Competes Reauthorization Act of 2014”.

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

Sec. 1. Short title; table of contents.

**TITLE I—OSTP; GOVERNMENTWIDE SCIENCE**

**Subtitle A—General Provisions**

Sec. 101. National Science and Technology Council amendments.  
 Sec. 102. Review of Federal regulations and reporting requirements.  
 Sec. 103. Amendments to prize competitions.  
 Sec. 104. Coordination of international science and technology partnerships.

**Subtitle B—Reauthorization of the National Nanotechnology Initiative**

Sec. 111. Short title.  
 Sec. 112. National Nanotechnology Program amendments.  
 Sec. 113. Societal dimensions of nanotechnology.  
 Sec. 114. Nanotechnology education.  
 Sec. 115. Technology transfer.  
 Sec. 116. Signature initiatives in areas of national importance.  
 Sec. 117. Nanomanufacturing research.  
 Sec. 118. Definitions.

**TITLE II—STEM EDUCATION AND DIVERSITY**

**Subtitle A—STEM Education and Workforce**

Sec. 201. Sense of Congress.  
 Sec. 202. Coordination of Federal STEM education.  
 Sec. 203. Grand challenges in education research.  
 Sec. 204. Establishment of the Advanced Research Project Agency-Education.  
 Sec. 205. Community college and industry partnerships STEM pilot grant program.  
 Sec. 206. National Research Council report on STEAM education.  
 Sec. 207. Engaging Federal scientists and engineers in STEM education.

**Subtitle B—Broadening Participation in STEM**

Sec. 211. Short title.  
 Sec. 212. Purpose.  
 Sec. 213. Federal science agency policies for caregivers.  
 Sec. 214. Collection and reporting of data on Federal research grants.  
 Sec. 215. Policies for review of Federal research grants.  
 Sec. 216. Collection of data on demographics of faculty.  
 Sec. 217. Cultural and institutional barriers to expanding the academic and Federal STEM workforce.  
 Sec. 218. Research and dissemination at the National Science Foundation.  
 Sec. 219. Report to Congress.

- Sec. 220. National Science Foundation support for increasing diversity among STEM faculty at institutions of higher education.
- Sec. 221. National Science Foundation support for broadening participation in undergraduate STEM education.
- Sec. 222. Definitions.

### TITLE III—NATIONAL SCIENCE FOUNDATION

#### Subtitle A—General Provisions

- Sec. 301. Authorization of appropriations.
- Sec. 302. Sense of Congress on support for all fields of science and engineering.
- Sec. 303. Management and oversight of large facilities.
- Sec. 304. Data management plans.
- Sec. 305. Support for potentially transformative research.
- Sec. 306. Strengthening institutional research partnerships.
- Sec. 307. Innovation Corps.
- Sec. 308. Definitions.

#### Subtitle B—STEM Education

- Sec. 321. National Science Board report on consolidation of STEM education activities at the Foundation.
- Sec. 322. Models for graduate student support.
- Sec. 323. Undergraduate STEM education reform.
- Sec. 324. Advanced manufacturing education.
- Sec. 325. STEM education partnerships.
- Sec. 326. Noyce scholarship program amendments.
- Sec. 327. Informal STEM education.
- Sec. 328. Research and development to support improved K–12 learning.

### TITLE IV—NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY

- Sec. 401. Short title.
- Sec. 402. Authorization of appropriations.
- Sec. 403. Advanced manufacturing technology consortia.
- Sec. 404. Network for manufacturing innovation.
- Sec. 405. Hollings Manufacturing Extension Partnership.
- Sec. 406. Bioscience measurement science and standards.
- Sec. 407. National Academy of Sciences review.
- Sec. 408. Improving NIST collaboration with other agencies.
- Sec. 409. Miscellaneous provisions.

### TITLE V—INNOVATION

- Sec. 501. Office of Innovation and Entrepreneurship.
- Sec. 502. Federal loan guarantees for innovative technologies in manufacturing.
- Sec. 503. Regional Innovation Program.
- Sec. 504. Innovation voucher pilot program.
- Sec. 505. Federal Acceleration of State Technology Commercialization Pilot Program.
- Sec. 506. National Academies report on university incubators and accelerators.

### TITLE VI—DEPARTMENT OF ENERGY

#### Subtitle A—Office of Science

- Sec. 601. Short title.
- Sec. 602. Definitions.
- Sec. 603. Mission of the Office of Science.
- Sec. 604. Basic energy sciences program.
- Sec. 605. Biological and environmental research.
- Sec. 606. Advanced scientific computing research program.
- Sec. 607. Fusion energy research.
- Sec. 608. High energy physics program.
- Sec. 609. Nuclear physics program.
- Sec. 610. Science laboratories infrastructure program.
- Sec. 611. Authorization of appropriations.

#### Subtitle B—ARPA–E

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

#### Subtitle C—Energy Innovation

- Sec. 641. Energy innovation hubs.
- Sec. 642. Participation in the Innovation Corps program.
- Sec. 643. Technology transfer.
- Sec. 644. Elimination of cost sharing requirement for research and development activities conducted by universities and nonprofit institutions.
- Sec. 645. Pilot Race to the Top for Energy Efficiency and Grid Modernization Program.
- Sec. 646. Rename Under Secretary for Science to Under Secretary for Science and Energy.
- Sec. 647. Special hiring authority for scientific, engineering, and project management personnel.

1 **TITLE I—OSTP;**  
 2 **GOVERNMENTWIDE SCIENCE**  
 3 **Subtitle A—General Provisions**  
 4 **SEC. 101. NATIONAL SCIENCE AND TECHNOLOGY COUNCIL**  
 5 **AMENDMENTS.**

6 Section 401 of the National Science and Technology  
 7 Policy, Organization, and Priorities Act of 1977 (42  
 8 U.S.C. 6651) is amended—

9 (1) in subsection (a), by striking “Federal Co-  
 10 ordinating Council for Science, Engineering, and  
 11 Technology” and inserting “National Science and  
 12 Technology Council”;

(2) in subsection (b), by striking “and Energy Research and Development Administration” and inserting “Department of Energy, and any other agency designated by the President”; and

(3) in subsection (e)—

(A) by striking “engineering, and technology” and inserting “engineering, technology, innovation, and STEM education”;

(B) in paragraph (1), by striking “engineering, and technological” and inserting “engineering, technological, innovation, and STEM education”;

(C) by redesignating paragraphs (3) and (4) as paragraphs (4) and (5), respectively; and

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

“(3) address research needs identified under paragraph (2) through appropriate funding mechanisms, which may include solicitations involving 2 or more agencies and public-private partnerships;”.

**SEC. 102. REVIEW OF FEDERAL REGULATIONS AND REPORTING REQUIREMENTS.**

(a) ESTABLISHMENT.—The Director of the Office of Science and Technology Policy shall establish or designate a working group under the National Science and Tech-

1 nology Council with the responsibility of reviewing Federal  
2 regulatory and reporting requirements across Federal  
3 agencies that affect the conduct of United States research  
4 in an effort to reduce regulatory burdens and to eliminate  
5 and harmonize duplicative regulatory and reporting re-  
6 quirements.

7 (b) RESPONSIBILITIES.—The working group estab-  
8 lished or designated under subsection (a) shall—

9 (1) periodically review all Federal regulations  
10 and reporting requirements that affect the conduct  
11 of United States research to—

12 (A) identify ways to harmonize overlapping  
13 or duplicative research regulations and report-  
14 ing requirements across Federal agencies;

15 (B) evaluate such regulations and report-  
16 ing requirements in relationship to the risks the  
17 requirements seek to address to determine if  
18 the benefits of the requirements are commensu-  
19 rate with the costs to the progress of science or  
20 to the taxpayer;

21 (C) identify any regulations that are ap-  
22 plied to scientific researchers or to research-per-  
23 forming institutions for which exemptions could  
24 be reasonably applied or for which adjustments

1           could be made to better fit those regulations to  
2           diverse research environments; and

3           (D) identify any specific regulations which  
4           could be refocused on performance-based goals  
5           rather than on process while still meeting the  
6           desired outcome;

7           (2) examine the extent to which agencies' guid-  
8           ance documents adhere with the most recently up-  
9           dated version of the Office of Management and  
10          Budget's Agency Good Guidance Practices bulletin;  
11          and

12          (3) develop and update at least once every 3  
13          years a strategic plan for streamlining Federal regu-  
14          lations and reporting requirements that affect the  
15          conduct of United States research that contains, at  
16          a minimum—

17                (A) a priority list of research-related regu-  
18                lations, reporting requirements, and agency  
19                guidance to be harmonized, streamlined, up-  
20                dated, or eliminated; and

21                (B) a plan, including a timeline, for imple-  
22                menting the regulatory and reporting reforms  
23                identified in subparagraph (A).

24          (c) STAKEHOLDER INPUT.—In carrying out the re-  
25          sponsibilities under subsection (b), including the develop-

1 ment of the strategic plan under subsection (b)(3), the  
2 working group established or designated under subsection  
3 (a) shall take into account input and recommendations  
4 from non-Federal stakeholders, including federally funded  
5 and nonfederally funded researchers, institutions of higher  
6 education, scientific disciplinary societies and associations,  
7 nonprofit research institutions, industry, including small  
8 businesses, federally funded research and development  
9 centers, and others with a stake in ensuring effectiveness,  
10 efficiency, and accountability in the performance of sci-  
11 entific research.

12 (d) RESPONSIBILITIES OF OSTP.—The Director of  
13 the Office of Science and Technology Policy, in collabora-  
14 tion with the Office of Management and Budget Office  
15 of Information and Regulatory Affairs, shall encourage  
16 and monitor the efforts of the participating agencies to  
17 ensure that the strategic plan is developed under sub-  
18 section (b)(3) and that appropriate steps are taken by the  
19 agencies to effectively implement the recommendations,  
20 achieve the objectives, and to adhere to the timeline in  
21 the strategic plan.

22 (e) REPORT.—Not later than 1 year after the date  
23 of enactment of this Act, the Director of the Office of  
24 Science and Technology Policy shall transmit the priority  
25 list and strategic plan developed under subsection (b)(3)



1 to the Congress. The Director shall further provide a re-  
2 port annually to the Congress, to be submitted not later  
3 than 60 days after the submission of the President’s an-  
4 nual budget request, on the progress toward implementa-  
5 tion of the regulatory reforms outlined in the strategic  
6 plan.

7 **SEC. 103. AMENDMENTS TO PRIZE COMPETITIONS.**

8 Section 24 of the Stevenson-Wydler Technology Inno-  
9 vation Act of 1980 (15 U.S.C. 3719) is amended—

10 (1) in subsection (c)—

11 (A) by inserting “competition” after “sec-  
12 tion, a prize”;

13 (B) by inserting “types” after “following”;  
14 and

15 (C) in paragraph (4), by striking “prizes”  
16 and inserting “prize competitions”;

17 (2) in subsection (f)—

18 (A) by striking “in the Federal Register”  
19 and inserting “on a publicly accessible Govern-  
20 ment website, such as [www.challenge.gov](http://www.challenge.gov),”; and

21 (B) in paragraph (4), by striking “prize”  
22 and inserting “cash prize purse”;

23 (3) in subsection (g), by striking “prize” and  
24 inserting “cash prize purse”;

1 (4) in subsection (h), by inserting “prize” be-  
2 fore “competition” both places it appears;

3 (5) in subsection (i)—

4 (A) in paragraph (1)(B), by inserting  
5 “prize” before “competition”;

6 (B) in paragraph (2)(A), by inserting  
7 “prize” before “competition” both places it ap-  
8 pears;

9 (C) by redesignating paragraph (3) as  
10 paragraph (4); and

11 (D) by inserting after paragraph (2) the  
12 following new paragraph:

13 “(3) WAIVER.—An agency may waive the re-  
14 quirement under paragraph (2). The annual report  
15 under subsection (p) shall include a list of such  
16 waivers granted during the preceding fiscal year,  
17 along with an explanation of the reasons for grant-  
18 ing the waivers.”;

19 (6) in subsection (j) by amending paragraph (2)  
20 to read as follows:

21 “(2) INTELLECTUAL PROPERTY.—

22 “(A) LICENSES.—The Federal Government  
23 may negotiate a license for the use of intellec-  
24 tual property developed by a participant for a  
25 prize competition.

1           “(B) OTHER CONDITIONS.—A Federal  
2           agency or agencies in cooperation may require  
3           participants to agree in advance to a specific  
4           approach to intellectual property as a condition  
5           for eligibility to participate in a prize competi-  
6           tion.”;

7           (7) in subsection (k)—

8                 (A) in paragraph (2)(A), by inserting  
9                 “prize” before “competition”; and

10                (B) in paragraph (3), by inserting “prize”  
11                before “competitions” both places it appears;

12           (8) in subsection (l), by striking all after “may  
13           enter into” and inserting “a grant, contract, cooper-  
14           ative agreement, or other agreement with a private  
15           sector for-profit or nonprofit entity to administer the  
16           prize competition, subject to the provisions of this  
17           section.”;

18           (9) in subsection (m)—

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

21                 “(1) IN GENERAL.—Support for a prize com-  
22                 petition under this section, including financial sup-  
23                 port for the design and administration of a prize  
24                 competition or funds for a cash prize purse, may  
25                 consist of Federal appropriated funds and funds

1 provided by private sector for-profit and nonprofit  
2 entities. The head of an agency may accept funds  
3 from other Federal agencies, private sector for-profit  
4 entities, and nonprofit entities to support such prize  
5 competitions. The head of an agency may not give  
6 any special consideration to any private sector for-  
7 profit or nonprofit entity in return for a donation.”;

8 (B) in paragraph (2), by striking “prize  
9 awards” and inserting “cash prize purses”;

10 (C) in paragraph (3)(A)—

11 (i) by striking “No prize” and insert-  
12 ing “No prize competition”; and

13 (ii) by striking “the prize” and insert-  
14 ing “the cash prize purse”;

15 (D) in paragraph (3)(B), by striking “a  
16 prize” and inserting “a cash prize purse”;

17 (E) in paragraph (3)(B)(i), by inserting  
18 “competition” after “prize”;

19 (F) in paragraph (4)(A), by striking “a  
20 prize” and inserting “a cash prize purse”; and

21 (G) in paragraph (4)(B), by striking “cash  
22 prizes” and inserting “cash prize purses”;

23 (10) in subsection (n), by inserting “for both  
24 for-profit and nonprofit entities,” after “contract ve-  
25 hicle”;

1           (11) in subsection (o)(1), by striking “or pro-  
 2       viding a prize” and insert “a prize competition or  
 3       providing a cash prize purse”; and

4           (12) in subsection (p)—

5               (A) in the heading, by striking “ANNUAL  
 6       REPORT” and inserting “BIENNIAL REPORT”;

7               (B) in paragraph (1), by striking “of each  
 8       year” and inserting “of each odd-numbered  
 9       year”; and

10              (C) in paragraph (2)(C), by striking “cash  
 11       prizes” both places it occurs and inserting  
 12       “cash prize purses”.

13 **SEC. 104. COORDINATION OF INTERNATIONAL SCIENCE**  
 14 **AND TECHNOLOGY PARTNERSHIPS.**

15       (a) **SHORT TITLE.**—This section may be cited as the  
 16 “International Science and Technology Cooperation Act of  
 17 2014”.

18       (b) **ESTABLISHMENT.**—The Director of the Office of  
 19 Science and Technology Policy shall establish a body  
 20 under the National Science and Technology Council  
 21 (NSTC) with the responsibility to identify and coordinate  
 22 international science and technology cooperation that can  
 23 strengthen the United States science and technology en-  
 24 terprise, improve economic and national security, and sup-  
 25 port United States foreign policy goals.

1       (c) NSTC BODY LEADERSHIP.—The body estab-  
2 lished under subsection (b) shall be co-chaired by senior  
3 level officials from the Office of Science and Technology  
4 Policy and the Department of State.

5       (d) RESPONSIBILITIES.—The body established under  
6 subsection (b) shall—

7           (1) plan and coordinate interagency inter-  
8 national science and technology cooperative research  
9 and training activities and partnerships supported or  
10 managed by Federal agencies and work with other  
11 National Science and Technology Council commit-  
12 tees to help plan and coordinate the international  
13 component of national science and technology prior-  
14 ities;

15           (2) establish Federal priorities and policies for  
16 aligning, as appropriate, international science and  
17 technology cooperative research and training activi-  
18 ties and partnerships supported or managed by Fed-  
19 eral agencies with the foreign policy goals of the  
20 United States;

21           (3) identify opportunities for new international  
22 science and technology cooperative research and  
23 training partnerships that advance both the science  
24 and technology and the foreign policy priorities of  
25 the United States;

1           (4) in carrying out paragraph (3), solicit input  
2           and recommendations from non-Federal science and  
3           technology stakeholders, including universities, sci-  
4           entific and professional societies, industry, and rel-  
5           evant organizations and institutions; and

6           (5) identify broad issues that influence the abil-  
7           ity of United States scientists and engineers to col-  
8           laborate with foreign counterparts, including bar-  
9           riers to collaboration and access to scientific infor-  
10          mation.

11          (e) REPORT TO CONGRESS.—The Director of the Of-  
12          fice of Science and Technology Policy shall transmit a re-  
13          port, to be updated annually, to the Committee on Science,  
14          Space, and Technology and the Committee on Foreign Af-  
15          fairs of the House of Representatives, and to the Com-  
16          mittee on Commerce, Science, and Transportation and the  
17          Committee on Foreign Relations of the Senate. The report  
18          shall also be made available to the public on the reporting  
19          agency’s website. The report shall contain a description  
20          of—

21                (1) the priorities and policies established under  
22                subsection (d)(2);

23                (2) the ongoing and new partnerships estab-  
24                lished since the last update to the report;

1           (3) the means by which stakeholder input was  
 2       received, as well as summary views of stakeholder  
 3       input; and

4           (4) the issues influencing the ability of United  
 5       States scientists and engineers to collaborate with  
 6       foreign counterparts.

## 7   **Subtitle B—Reauthorization of the** 8   **National Nanotechnology Initiative**

### 9   **SEC. 111. SHORT TITLE.**

10       This subtitle may be cited as the “National Nano-  
 11   technology Initiative Amendments Act of 2014”.

### 12   **SEC. 112. NATIONAL NANOTECHNOLOGY PROGRAM AMEND-** 13       **MENTS.**

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

16           (1) in section 2—

17               (A) in subsection (c), by amending para-  
 18       graph (4) to read as follows:

19               “(4) develop, and update every 3 years there-  
 20       after, a strategic plan to guide the activities de-  
 21       scribed under subsection (b) that specifies near-term  
 22       and long-term objectives for the Program, the antici-  
 23       pated timeframe for achieving the near-term objec-  
 24       tives, and the metrics to be used for assessing  
 25       progress toward the objectives, and that describes—



1           “(A) how the Program will move results  
2           out of the laboratory and into applications for  
3           the benefit of society, including through co-  
4           operation and collaborations with nanotechnol-  
5           ogy research, development, and technology tran-  
6           sition initiatives supported by the States; and

7           “(B) proposed research in areas of na-  
8           tional importance in accordance with the re-  
9           quirements of section 116 of the National  
10          Nanotechnology Initiative Amendments Act of  
11          2014;”;

12          (B) in subsection (d)—

13               (i) by redesignating paragraphs (1)  
14               through (5) as paragraphs (2) through (6),  
15               respectively;

16               (ii) by inserting before paragraph (2),  
17               as redesignated by clause (i), the following:

18               “(1) the Program budget, for the previous fiscal  
19               year, for each agency that participates in the Pro-  
20               gram, and for each program component area;”;

21               (iii) by amending paragraph (6), as  
22               redesignated by clause (i), to read as fol-  
23               lows:

24               “(6) an assessment of how Federal agencies are  
25               implementing the plan described in subsection (c)(7)

1 and a description of the amount of Small Business  
2 Innovative Research and Small Business Technology  
3 Transfer Research funds supporting the plan.”; and

4 (C) by adding at the end the following new  
5 subsection:

6 “(e) STANDARDS SETTING.—The agencies partici-  
7 pating in the Program shall support the activities of com-  
8 mittees involved in the development of standards for nano-  
9 technology and may reimburse the travel costs of scientists  
10 and engineers who participate in activities of such commit-  
11 tees.”;

12 (2) in section 3—

13 (A) by amending subsection (b)(1) to read  
14 as follows:

15 “(b) FUNDING.—

16 “(1) IN GENERAL.—The operation of the Na-  
17 tional Nanotechnology Coordination Office shall be  
18 supported by funds from each agency participating  
19 in the Program.

20 “(2) PROPORTION.—The portion of such Of-  
21 fice’s total budget provided by each agency for each  
22 fiscal year shall be in the same proportion as the  
23 agency’s share of the total budget for the Program  
24 for the previous fiscal year, as specified in the report  
25 required under section 2(d)(1).

1           “(3) EXCEPTION.—The Director of the Na-  
2           tional Nanotechnology Coordination Office may es-  
3           tablish a minimum contribution or other exception to  
4           the requirement in paragraph (2) for participating  
5           agencies whose share of the total budget for the Pro-  
6           gram is below a threshold level, to be set by the Di-  
7           rector.”; and

8                       (B) by adding at the end the following new  
9           subsection:

10          “(d) PUBLIC INFORMATION.—

11               “(1) DATABASE.—

12                       “(A) IN GENERAL.—The National Nano-  
13           technology Coordination Office shall develop  
14           and maintain a database accessible by the pub-  
15           lic of projects funded under at least the Envi-  
16           ronmental, Health, and Safety program compo-  
17           nent area, or any successor program component  
18           area, including, to the extent practicable, a de-  
19           scription of each project, its source of funding  
20           by agency, and its funding history.

21                       “(B) ORGANIZATION.—Projects shall be  
22           grouped by major objective as defined by the re-  
23           search plan required under section 3(b) of the  
24           National Nanotechnology Initiative Amend-  
25           ments Act of 2014.

1 “(2) ACCESSIBLE FACILITIES.—

2 “(A) IN GENERAL.—The National Nano-  
3 technology Coordination Office shall develop,  
4 maintain, and publicize information on nano-  
5 technology facilities supported under the Pro-  
6 gram, and may include information on nano-  
7 technology facilities supported by the States,  
8 that are accessible for use by individuals from  
9 academic institutions and from industry.

10 “(B) WEBSITES.—The National Nanotech-  
11 nology Coordination Office shall maintain active  
12 web links to the websites for each of these fa-  
13 cilities and shall work with each facility sup-  
14 ported under the Program to ensure that each  
15 facility publishes on its respective website up-  
16 dated information on the terms and conditions  
17 for the use of the facility, a description of the  
18 capabilities of the instruments and equipment  
19 available for use at the facility, and a descrip-  
20 tion of the technical support available to assist  
21 users of the facility.”;

22 (3) in section 4—

23 (A) in subsection (a), by adding at the end  
24 the following: “The co-chairs of the Advisory  
25 Panel shall meet the qualifications of Panel

1 membership required in subsection (b) and may  
2 be members of the President’s Council of Advi-  
3 sors on Science and Technology. The Advisory  
4 Panel shall include members having specific  
5 qualifications tailored to enable it to carry out  
6 the requirements of subsection (c)(6).”;

7 (B) in subsection (c)—

8 (i) by striking paragraph (1); and

9 (ii) by redesignating paragraphs (2)  
10 through (7) as paragraphs (1) through (6),  
11 respectively; and

12 (C) by amending subsection (d) to read as  
13 follows:

14 “(d) REPORTS.—The Advisory Panel shall report not  
15 less frequently than every 3 years, and, to the extent prac-  
16 ticable, 1 year following each of the National Research  
17 Council triennial reviews required under section 5, to the  
18 President on its assessments under subsection (c) and its  
19 recommendations for ways to improve the Program. The  
20 Director of the Office of Science and Technology Policy  
21 shall transmit a copy of each report under this subsection  
22 to the Committee on Commerce, Science, and Transpor-  
23 tation of the Senate, the Committee on Science, Space,  
24 and Technology of the House of Representatives, and  
25 other appropriate committees of the Congress.”;

1 (4) by amending section 5 to read as follows:

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

4 “(a) IN GENERAL.—The Director of the National  
5 Nanotechnology Coordination Office shall enter into an ar-  
6 rangement with the National Research Council of the Na-  
7 tional Academy of Sciences to conduct a triennial review  
8 of the Program. The Director shall ensure that the ar-  
9 rangement with the National Research Council is con-  
10 cluded in order to allow sufficient time for the reporting  
11 requirements of subsection (b) to be satisfied. Each tri-  
12 ennial review shall include an evaluation of the—

13 “(1) research priorities and technical content of  
14 the Program, including whether the balance of fund-  
15 ing among program component areas, as designated  
16 according to section 2(c)(2), is appropriate;

17 “(2) Program’s scientific and technological ac-  
18 complishments and its success in transferring tech-  
19 nology to the private sector; and

20 “(3) adequacy of the Program’s activities ad-  
21 dressing ethical, legal, environmental, and other ap-  
22 propriate societal concerns, including human health  
23 concerns.

24 “(b) PRIORITY REPORTS.—If the Director of the Na-  
25 tional Nanotechnology Coordination Office, working with

1 the National Research Council and with input from the  
 2 Advisory Panel, determines that a more narrowly focused  
 3 review of the Program is in the best interests of the Pro-  
 4 gram, the Director may enter into such an arrangement  
 5 with the National Research Council in lieu of a full review  
 6 as required under subsection (a), but not more often than  
 7 every second triennial review.

8 “(c) EVALUATION TO BE TRANSMITTED TO CON-  
 9 GRESS.—The National Research Council shall document  
 10 the results of each triennial review carried out in accord-  
 11 ance with this section in a report that includes any rec-  
 12 ommendations for changes to the Program’s objectives,  
 13 technical content, or other policy or Program changes.  
 14 Each report shall be submitted to the Director of the Na-  
 15 tional Nanotechnology Coordination Office, who shall  
 16 transmit it to the Advisory Panel, the Committee on Com-  
 17 merce, Science, and Transportation of the Senate, and the  
 18 Committee on Science, Space, and Technology of the  
 19 House of Representatives.”; and

20 (5) in section 10—

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

23 “(2) NANOTECHNOLOGY.—The term ‘nanotech-  
 24 nology’ means the science and technology that will  
 25 enable one to understand, measure, model, image,

1       manipulate, and manufacture at the nanoscale,  
2       aimed at creating materials, devices, and systems  
3       with fundamentally new properties or functions.”;  
4       and

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

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

10 **SEC. 113. SOCIETAL DIMENSIONS OF NANOTECHNOLOGY.**

11       (a) COORDINATOR FOR ENVIRONMENTAL, HEALTH,  
12 AND SAFETY RESEARCH.—The Director of the Office of  
13 Science and Technology Policy shall designate an associate  
14 director of the Office of Science and Technology Policy  
15 or other appropriate senior government official as the Co-  
16 ordinator for Environmental, Health, and Safety Re-  
17 search. The Coordinator shall be responsible for oversight  
18 of the coordination, planning, and budget prioritization of  
19 research and other activities related to environmental,  
20 health, safety, and other appropriate societal concerns re-  
21 lated to nanotechnology. The responsibilities of the Coor-  
22 dinator shall include—

23               (1) ensuring that a research plan for the envi-  
24       ronmental, health, and safety research activities re-  
25       quired under subsection (b) is developed, updated,



1 and implemented and that the plan is responsive to  
2 the recommendations of the Advisory Panel estab-  
3 lished under section 4(a) of the 21st Century Nano-  
4 technology Research and Development Act (15  
5 U.S.C. 7503(a)); and

6 (2) encouraging and monitoring the efforts of  
7 the agencies participating in the Program to allocate  
8 the level of resources and management attention  
9 necessary to ensure that the environmental, health,  
10 safety, and other appropriate societal concerns re-  
11 lated to nanotechnology are addressed under the  
12 Program.

13 (b) RESEARCH PLAN.—

14 (1) IN GENERAL.—The Coordinator for Envi-  
15 ronmental, Health, and Safety Research shall con-  
16 vene and chair a panel comprised of representatives  
17 from the agencies funding research activities under  
18 the Environmental, Health, and Safety program  
19 component area of the Program, or any successor  
20 program component area, and from such other agen-  
21 cies as the Coordinator considers necessary to de-  
22 velop, periodically update, and coordinate the imple-  
23 mentation of a research plan for this program com-  
24 ponent area. Such panel may be a subgroup of the  
25 Nanoscale Science, Engineering, and Technology

1 Subcommittee of the National Science and Tech-  
2 nology Council. In developing and updating the plan,  
3 the panel convened by the Coordinator shall solicit  
4 and be responsive to recommendations and advice  
5 from—

6 (A) the Advisory Panel established under  
7 section 4(a) of the 21st Century Nanotechnol-  
8 ogy Research and Development Act (15 U.S.C.  
9 7503(a)); and

10 (B) the agencies responsible for environ-  
11 mental, health, and safety regulations associ-  
12 ated with the production, use, and disposal of  
13 nanoscale materials and products.

14 (2) DEVELOPMENT OF STANDARDS.—The plan  
15 required under paragraph (1) shall include a de-  
16 scription of how the Program will help to ensure the  
17 development of—

18 (A) standards related to nomenclature as-  
19 sociated with engineered nanoscale materials;

20 (B) engineered nanoscale standard ref-  
21 erence materials for environmental, health, and  
22 safety testing; and

23 (C) standards related to methods and pro-  
24 cedures for detecting, measuring, monitoring,  
25 sampling, and testing engineered nanoscale ma-

1           terials for environmental, health, and safety im-  
2           pacts.

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

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

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

11                  (C) with respect to subparagraphs (A) and  
12                  (B), describe the role of each agency carrying  
13                  out or sponsoring research in order to meet the  
14                  objectives specified under subparagraph (A) and  
15                  to achieve the milestones specified under sub-  
16                  paragraph (B); and

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

20           (4) TRANSMITTAL TO CONGRESS.—Not later  
21           than 6 months after the date of enactment of this  
22           Act, the plan required under paragraph (1) shall be  
23           transmitted to the Committee on Commerce,  
24           Science, and Transportation of the Senate and the

1 Committee on Science, Space, and Technology of the  
2 House of Representatives.

3 (5) UPDATING AND APPENDING TO REPORT.—

4 The plan required under paragraph (1) shall be up-  
5 dated at least every 3 years and may be submitted  
6 as part of the report required under section 2(c)(4)  
7 of the 21st Century Nanotechnology Research and  
8 Development Act (15 U.S.C. 7501(c)(4)).

9 **SEC. 114. NANOTECHNOLOGY EDUCATION.**

10 (a) UNDERGRADUATE EDUCATION PROGRAMS.—The  
11 Program shall support efforts to introduce nanoscale  
12 science, engineering, and technology into undergraduate  
13 science and engineering education through a variety of  
14 interdisciplinary approaches. Activities supported may in-  
15 clude—

16 (1) development of courses of instruction or  
17 modules to existing courses;

18 (2) faculty professional development; and

19 (3) acquisition of equipment and instrumenta-  
20 tion suitable for undergraduate education and re-  
21 search in nanotechnology.

22 (b) INTERAGENCY COORDINATION OF EDUCATION.—

23 The Committee established under section 2(c) of the 21st  
24 Century Nanotechnology Research and Development Act  
25 (15 U.S.C. 7501(c)) shall coordinate, as appropriate, with

1 the Committee established under section 101 of the Amer-  
2 ica COMPETES Reauthorization Act of 2010 (42 U.S.C.  
3 6621) to prioritize, plan, and assess the educational activi-  
4 ties supported under the Program.

5 (c) SOCIETAL DIMENSIONS IN NANOTECHNOLOGY  
6 EDUCATION ACTIVITIES.—Activities supported under the  
7 Education and Societal Dimensions program component  
8 area, or any successor program component area, that in-  
9 volve informal, precollege, or undergraduate nanotechnol-  
10 ogy education shall include education regarding the envi-  
11 ronmental, health and safety, and other societal aspects  
12 of nanotechnology.

13 (d) REMOTE ACCESS TO NANOTECHNOLOGY FACILI-  
14 TIES.—

15 (1) IN GENERAL.—Agencies supporting nano-  
16 technology research facilities as part of the Program  
17 shall require the entities that operate such facilities  
18 to allow access via the Internet, and support the  
19 costs associated with the provision of such access, by  
20 secondary school students and teachers, to instru-  
21 ments and equipment within such facilities for edu-  
22 cational purposes. The agencies may waive this re-  
23 quirement for cases when particular facilities would  
24 be inappropriate for educational purposes or the  
25 costs for providing such access would be prohibitive.

1           (2) PROCEDURES.—The agencies identified in  
2       paragraph (1) shall require the entities that operate  
3       such nanotechnology research facilities to establish  
4       and publish procedures, guidelines, and conditions  
5       for the submission and approval of applications for  
6       the use of the facilities for the purpose identified in  
7       paragraph (1) and shall authorize personnel who op-  
8       erate the facilities to provide necessary technical  
9       support to students and teachers.

10 **SEC. 115. TECHNOLOGY TRANSFER.**

11       (a) PROTOTYPING.—

12           (1) ACCESS TO FACILITIES.—In accordance  
13       with section 2(b)(7) of 21st Century Nanotechnology  
14       Research and Development Act (15 U.S.C.  
15       7501(b)(7)), the agencies supporting nanotechnology  
16       research facilities as part of the Program shall pro-  
17       vide access to such facilities to companies for the  
18       purpose of assisting the companies in the develop-  
19       ment of prototypes of nanoscale products, devices, or  
20       processes (or products, devices, or processes enabled  
21       by nanotechnology) for determining proof of concept.  
22       The agencies shall publicize the availability of these  
23       facilities and encourage their use by companies as  
24       provided for in this section. The agencies may waive

1       this requirement for academic facilities for which the  
2       costs of providing such access would be prohibitive.

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

5           (A) shall establish and publish procedures,  
6       guidelines, and conditions for the submission  
7       and approval of applications for use of nano-  
8       technology facilities;

9           (B) shall publish descriptions of the capa-  
10      bilities of facilities available for use under this  
11      subsection, including the availability of tech-  
12      nical support; and

13          (C) may waive recovery, require full recov-  
14      ery, or require partial recovery of the costs as-  
15      sociated with use of the facilities for projects  
16      under this subsection.

17          (3) SELECTION AND CRITERIA.—

18          (A) IN GENERAL.—In cases when less than  
19      full cost recovery is required pursuant to para-  
20      graph (2)(C), projects provided access to nano-  
21      technology facilities in accordance with this sub-  
22      section shall be selected through a competitive,  
23      merit-based process, and the criteria for the se-  
24      lection of such projects shall include at a min-

1           imum the readiness of the project for tech-  
2           nology demonstration.

3                   (B) SPECIAL CONSIDERATION.—The agen-  
4           cies may give special consideration in selecting  
5           projects to applications that are relevant to im-  
6           portant national needs or requirements.

7           (b) COLLABORATION WITH INDUSTRY.—The Pro-  
8           gram shall coordinate with industry from all industrial  
9           sectors that would benefit from applications of nanotech-  
10          nology by—

11                   (1) enhancing communication of information re-  
12           lated to nanotechnology innovation, including infor-  
13           mation about research, education and training, man-  
14           ufacturing issues, and market-driven needs;

15                   (2) advancing and accelerating the creation of  
16           new products and manufacturing processes derived  
17           from discovery at the nanoscale by working with in-  
18           dustry, including small and medium-sized manufac-  
19           turers;

20                   (3) developing innovative methods for transfer-  
21           ring nanotechnology products and processes from  
22           Federal agencies to industry; and

23                   (4) facilitating industry-led partnerships be-  
24           tween the Program and industry sectors, including  
25           regional partnerships.



1 (c) COORDINATION WITH STATE, REGIONAL, AND  
 2 LOCAL INITIATIVES.—Section 2(b)(5) of the 21st Century  
 3 Nanotechnology Research and Development Act (15  
 4 U.S.C. 7501(b)(5)) is amended to read as follows:

5 “(5) ensuring United States global leadership in  
 6 the development and application of nanotechnology,  
 7 including through the coordination and leveraging of  
 8 Federal investments with nanotechnology research,  
 9 development, and technology transition initiatives  
 10 supported by the States and regions across the coun-  
 11 try;”.

12 **SEC. 116. SIGNATURE INITIATIVES IN AREAS OF NATIONAL**  
 13 **IMPORTANCE.**

14 (a) IN GENERAL.—The Program shall include sup-  
 15 port for nanotechnology research and development activi-  
 16 ties directed toward topical and application areas that  
 17 have the potential for significant contributions to national  
 18 economic competitiveness and for other significant societal  
 19 benefits. The activities supported shall be designed to ad-  
 20 vance the development of research discoveries by dem-  
 21 onstrating technical solutions to important national chal-  
 22 lenges. The Advisory Panel shall make recommendations  
 23 to the Program for candidate research and development  
 24 areas for support under this section.

25 (b) CHARACTERISTICS.—

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

3                   (A) include projects selected on the basis  
4                   of applications for support through a competi-  
5                   tive, merit-based process;

6                   (B) involve collaborations among research-  
7                   ers in academic institutions and industry, and  
8                   may involve nonprofit research institutions and  
9                   Federal laboratories, as appropriate;

10                  (C) when possible, leverage Federal invest-  
11                  ments through collaboration with related State  
12                  initiatives; and

13                  (D) include a plan for fostering the trans-  
14                  fer of research discoveries and the results of  
15                  technology demonstration activities to industry  
16                  for commercial development.

17           (2) JOINT SOLICITATIONS.—Projects supported  
18           under this section shall include projects for which  
19           determination of the requirements for applications,  
20           review and selection of applications for support, and  
21           subsequent funding of projects shall be carried out  
22           by a collaboration of no fewer than 2 agencies par-  
23           ticipating in the Program. In selecting applications  
24           for support, agencies may, as appropriate, give spe-

1        cial consideration to projects that include cost shar-  
2        ing from non-Federal sources.

3            (3) INTERDISCIPLINARY RESEARCH CENTERS.—  
4        Research and development activities under this sec-  
5        tion may be supported through interdisciplinary  
6        nanotechnology research centers, as authorized by  
7        section 2(b)(4) of the 21st Century Nanotechnology  
8        Research and Development Act (15 U.S.C.  
9        7501(b)(4)), that are organized to investigate basic  
10       research questions and carry out technology dem-  
11       onstration activities in areas such as those identified  
12       in subsection (a).

13        (c) REPORT.—Reports required under section 2(d) of  
14       the 21st Century Nanotechnology Research and Develop-  
15       ment Act (15 U.S.C. 7501(d)) shall include a description  
16       of research and development areas supported in accord-  
17       ance with this section.

18       **SEC. 117. NANOMANUFACTURING RESEARCH.**

19        (a) RESEARCH AREAS.—The Program shall include  
20       research on—

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

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

4       (b) GREEN NANOTECHNOLOGY.—Interdisciplinary  
5       research centers supported under the Program in accord-  
6       ance with section 2(b)(4) of the 21st Century Nanotech-  
7       nology Research and Development Act (15 U.S.C.  
8       7501(b)(4)) that are focused on nanomanufacturing re-  
9       search shall include as part of the activities of such cen-  
10      ters—

11           (1) research on methods and approaches to de-  
12       velop environmentally benign nanoscale products and  
13       nanoscale manufacturing processes, taking into con-  
14       sideration relevant findings and results of research  
15       supported under the Environmental, Health, and  
16       Safety program component area, or any successor  
17       program component area;

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

20           (3) providing for the education of scientists and  
21       engineers through interdisciplinary studies in the  
22       principles and techniques for the design and develop-  
23       ment of environmentally benign nanoscale products  
24       and processes.

1 **SEC. 118. DEFINITIONS.**

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

6 **TITLE II—STEM EDUCATION AND**  
7 **DIVERSITY**

8 **Subtitle A—STEM Education and**  
9 **Workforce**

10 **SEC. 201. SENSE OF CONGRESS.**

11 (a) FISCAL YEAR 2014 BUDGET PROPOSAL.—It is  
12 the sense of Congress that Federal agencies need to de-  
13 velop and implement a comprehensive Federal STEM edu-  
14 cation strategy that focuses on leveraging the limited  
15 STEM education funding and other assets we have to in-  
16 vest for maximum student learning benefit, and that such  
17 a strategy will involve a reorganization of the current port-  
18 folio of Federal STEM investments. However, it is the  
19 sense of Congress that the Administration’s fiscal year  
20 2014 proposal to consolidate or eliminate 120 STEM pro-  
21 grams across 14 Federal agencies lacked input or support  
22 from the Federal agencies and the stakeholder commu-  
23 nities implicated in the proposal, was not based on evi-  
24 dence about program effectiveness, lacks clarity in how it  
25 will meet the goals of the strategic plan required in the  
26 America COMPETES Reauthorization Act of 2010, and

1 is not an adequate basis for implementing changes to ex-  
2 isting agency and interagency STEM activities.

3       (b) CoSTEM.—It is the sense of Congress that the  
4 National Science and Technology Council’s Committee on  
5 STEM Education (CoSTEM), required under the America  
6 COMPETES Reauthorization Act of 2010, has taken im-  
7 portant initial steps toward developing a comprehensive  
8 and defensible strategic plan through its completion of its  
9 first “Federal STEM Education 5-Year Strategic Plan,”  
10 but that much more work must be done to develop a clear  
11 evidence base for reorganization decisions and to solicit  
12 and take into account views and experience from stake-  
13 holders who help implement or are the beneficiaries of  
14 Federal STEM programs across the Nation. It is further  
15 the sense of Congress that agencies, through CoSTEM,  
16 should play a leading role in developing the Administra-  
17 tion’s budget proposals for STEM education just as they  
18 play a leading role in developing the budget proposals for  
19 other major interagency initiatives, such as the National  
20 Nanotechnology Initiative.

21       (c) MISSION AGENCIES.—It is the sense of Congress  
22 that science mission agencies such as the National Aero-  
23 nautics and Space Administration, the National Oceanic  
24 and Atmospheric Administration, and the Department of  
25 Energy are essential partners in contributing to the goals

1 and implementation of a Federal STEM strategic plan be-  
 2 cause such agencies have unique scientific and techno-  
 3 logical facilities as well as highly trained scientists who  
 4 are eager and able to contribute to improved STEM learn-  
 5 ing outcomes in their own communities. It is further the  
 6 sense of Congress that the Department of Education can  
 7 play an important role in implementing any Federal  
 8 STEM education strategy because of its unique relation-  
 9 ship with States, local educational agencies, schools, and  
 10 institutions of higher education, as well as its capacity to  
 11 scale and disseminate proven programs and models, but  
 12 that the Department must take steps to build capacity in  
 13 STEM education to maximize the effectiveness of any  
 14 Governmentwide leadership role in K–12 STEM edu-  
 15 cation.

16 **SEC. 202. COORDINATION OF FEDERAL STEM EDUCATION.**

17 Section 101 of America COMPETES Reauthoriza-  
 18 tion Act of 2010 (42 U.S.C. 6621) is amended—

19 (1) in subsection (b)(5)—

20 (A) by redesignating subparagraphs (A)  
 21 through (D) as subparagraphs (B) through (E),  
 22 respectively; and

23 (B) by inserting before subparagraph (B),  
 24 as so redesigned by subparagraph (A) of this  
 25 paragraph, the following new subparagraph:

1           “(A) have as its primary goal to leverage  
2           the limited STEM education funding and other  
3           assets, including intellectual capital, invested by  
4           Federal STEM agencies for maximum benefit  
5           to student learning;”;

6           (2) by striking the second subsection (b);

7           (3) by redesignating subsection (c) as sub-  
8           section (f);

9           (4) by inserting after subsection (b), the fol-  
10          lowing new subsections:

11          “(c) COORDINATOR FOR STEM EDUCATION.—The  
12          Director of the Office of Science and Technology Policy  
13          shall designate an associate director of the Office of  
14          Science and Technology Policy as the Coordinator for  
15          STEM Education. When an appropriate associate director  
16          is not available, the Director may designate another ap-  
17          propriate senior government official as the Coordinator for  
18          STEM Education. The Coordinator shall chair the com-  
19          mittee established under subsection (a). The Coordinator  
20          shall, with the assistance of appropriate senior officials  
21          from other Committee on STEM Education agencies, en-  
22          sure that the requirements of this section are satisfied.

23          “(d) STAKEHOLDER INPUT.—

24                 “(1) INTERAGENCY CONSOLIDATION.—For all  
25                 agency proposals to consolidate or transfer budgets



1 or functions for STEM education programs or ac-  
2 tivities between agencies, at the time of submission  
3 of such proposals to Congress, the Director shall re-  
4 port to Congress on activities undertaken by the Of-  
5 fice of Science and Technology Policy or by relevant  
6 agencies to take into consideration relevant input  
7 from the STEM Education Advisory Panel estab-  
8 lished under subsection (e) and other relevant edu-  
9 cation stakeholders.

10 “(2) INTRAAGENCY CONSOLIDATION.—For all  
11 agency proposals to internally consolidate or termi-  
12 nate STEM education programs with budgets ex-  
13 ceeding \$3,000,000, at the time of submission of  
14 such proposals to Congress, the head of the relevant  
15 agency shall report to Congress on activities to so-  
16 licit and take into consideration input on such pro-  
17 posals from the STEM Education Advisory Panel  
18 established under subsection (e) and other relevant  
19 education stakeholders.

20 “(e) STEM EDUCATION ADVISORY PANEL.—

21 “(1) IN GENERAL.—The President shall estab-  
22 lish or designate a STEM Education Advisory  
23 Panel. The cochairs of the Advisory Panel shall meet  
24 the qualifications of Panel membership required in  
25 paragraph (2) and may be members of the Presi-

1       dent’s Council of Advisors on Science and Tech-  
2       nology.

3               “(2) QUALIFICATIONS.—The Advisory Panel es-  
4       tablished or designated by the President under this  
5       subsection shall consist of members from academic  
6       institutions, industry, informal education providers,  
7       nonprofit STEM education organizations, founda-  
8       tions, and local and State educational agencies.  
9       Members of the Advisory Panel shall be qualified to  
10      provide advice on Federal STEM education pro-  
11      grams, best practices in STEM education, assess-  
12      ment of STEM education programs, STEM edu-  
13      cation standards, industry needs for STEM grad-  
14      uates, and public-private STEM education partner-  
15      ships.

16             “(3) DUTIES.—The Advisory Panel shall advise  
17      the President and the committee established under  
18      subsection (a) on implementing the Federal STEM  
19      education strategic plan required under subsection  
20      (b)(5) and coordinating Federal STEM programs  
21      with nongovernmental STEM initiatives and State  
22      and local educational agencies.

23             “(4) REPORT.—The Advisory Panel shall re-  
24      port, not more than 1 year after enactment of the  
25      America Competes Reauthorization Act of 2014, on

1 options for evidence-based implementation of the  
2 Federal STEM strategic plan required under sub-  
3 section (b)(5), including options for designating cer-  
4 tain agencies as coordinating leads for different pri-  
5 ority investment areas, timelines for implementation,  
6 and specific management, budget, policy, or other  
7 steps that agencies must take to effectively imple-  
8 ment the strategic plan.

9 “(5) SUNSET.—The authorization for the Advi-  
10 sory Panel established under this subsection shall  
11 expire 3 years after the date of enactment of the  
12 America Competes Reauthorization Act of 2014.”;  
13 and

14 (5) in subsection (f), as so redesignated by  
15 paragraph (3) of this section—

16 (A) by inserting “progress made in imple-  
17 menting” after “describing”;

18 (B) by striking paragraph (3); and

19 (C) by redesignating paragraphs (4) and  
20 (5) as paragraphs (3) and (4), respectively.

21 **SEC. 203. GRAND CHALLENGES IN EDUCATION RESEARCH.**

22 (a) IN GENERAL.—The Director of the National  
23 Science Foundation and the Secretary of Education shall  
24 collaborate in—

1           (1) identifying, prioritizing, and developing  
2           strategies to address grand challenges in research  
3           and development, including assessment, on the  
4           teaching and learning of STEM at the pre-K–12  
5           level, in formal and informal settings, for diverse  
6           learning populations, including individuals identified  
7           in section 33 or 34 of the Science and Engineering  
8           Equal Opportunities Act (42 U.S.C. 1885a or  
9           1885b); and

10          (2) ensuring the dissemination and promoting  
11          the utilization of the results of such research and de-  
12          velopment.

13          (b) STAKEHOLDER INPUT.—In identifying the grand  
14          challenges under subsection (a), the Director and the Sec-  
15          retary shall—

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

21               (2) solicit input from a wide range of stake-  
22               holders, including officials from State educational  
23               agencies and local educational agencies, STEM  
24               teachers, STEM education researchers, scientific  
25               and engineering societies, STEM faculty at institu-

1        tions of higher education, informal STEM education  
2        providers, businesses with a large STEM workforce,  
3        and other stakeholders in the teaching and learning  
4        of STEM at the pre-K–12 level, and may enter into  
5        an arrangement with the National Research Council  
6        for these purposes.

7        (c) TOPICS TO CONSIDER.—In identifying the grand  
8        challenges under subsection (a), the Director and the Sec-  
9        retary shall, at a minimum, consider research and develop-  
10      ment on—

11            (1) scalability, sustainability, and replication of  
12            successful STEM activities, programs, and models,  
13            in formal and informal environments;

14            (2) model systems that support improved teach-  
15            ing and learning of STEM across entire local edu-  
16            cational agencies and States, including rural areas,  
17            and encompassing and integrating the teaching and  
18            learning of STEM in formal and informal venues;

19            (3) implementation of new State mathematics  
20            and science standards;

21            (4) what makes a STEM teacher effective and  
22            STEM teacher professional development effective,  
23            including development of tools and methodologies to  
24            measure STEM teacher effectiveness;

1           (5) cyber-enabled and other technology tools for  
2     teaching and learning, including massive open online  
3     courses;

4           (6) STEM teaching and learning in informal  
5     environments, including development of tools and  
6     methodologies for assessing STEM teaching and  
7     learning in informal environments; and

8           (7) how integrating engineering with mathe-  
9     matics and science education may—

10           (A) improve student learning of mathe-  
11     matics and science;

12           (B) increase student interest and persist-  
13     ence in STEM; or

14           (C) improve student understanding of engi-  
15     neering design principles and of the built world.

16     (d) REPORT TO CONGRESS.—Not later than 12  
17     months after the date of enactment of this Act, the Direc-  
18     tor and the Secretary shall report to Congress with a de-  
19     scription of—

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

22           (2) the role of each agency in supporting re-  
23     search and development activities to address the  
24     grand challenges;

1           (3) the common metrics that will be used to as-  
2       sess progress toward meeting the grand challenges;

3           (4) plans for periodically updating the grand  
4       challenges;

5           (5) how the agencies will disseminate and pro-  
6       mote the utilization of the results of research and  
7       development activities carried out under this section  
8       to STEM education practitioners, to other Federal  
9       agencies that support STEM programs and activi-  
10      ties, and to non-Federal funders of STEM edu-  
11      cation; and

12          (6) how the agencies will support implementa-  
13      tion of best practices identified by the research and  
14      development activities.

15 **SEC. 204. ESTABLISHMENT OF THE ADVANCED RESEARCH**  
16 **PROJECT AGENCY-EDUCATION.**

17       (a) PROGRAM ESTABLISHED.—From the amounts  
18      appropriated for section 14007 of division A of the Amer-  
19      ican Recovery and Reinvestment Act of 2009 (Public Law  
20      111–5), the Secretary of Education may reserve up to 30  
21      percent to—

22           (1) establish and carry out the Advanced Re-  
23      search Projects Agency-Education (in this section  
24      referred to as “ARPA-ED”) to—

1           (A) identify and promote advances in  
2           learning, fundamental and applied sciences, and  
3           engineering that may be translated into new  
4           learning technologies;

5           (B) develop, test, and evaluate new learn-  
6           ing technologies and related processes; and

7           (C) accelerate transformational techno-  
8           logical advances in education;

9           (2) convene an advisory panel under subsection  
10          (d); and

11          (3) carry out the evaluation and dissemination  
12          requirements under subsection (e).

13          (b) APPOINTMENTS.—

14           (1) DIRECTOR.—ARPA–ED shall be under the  
15           direction of the Director of ARPA–ED, who shall be  
16           appointed by the Secretary.

17           (2) QUALIFIED INDIVIDUALS.—The Secretary  
18           shall appoint, for a term of not more than 4 years,  
19           qualified individuals who represent scientific, engi-  
20           neering, professional, and other personnel with ex-  
21           pertise in carrying out the activities described in this  
22           section to positions in ARPA–ED, at rates of com-  
23           pensation determined by the Secretary, without re-  
24           gard to the provisions of title 5, United States Code,  
25           except that such rates of compensation shall not to



1       exceed the rate for level I of the Executive Schedule  
2       under section 5312 of such title.

3       (c) FUNCTIONS OF ARPA-ED.—Upon consultation  
4       with the advisory panel convened under subsection (d), the  
5       Secretary shall select public and private entities to carry  
6       out the activities described in subsection (a)(1) by—

7           (1) awarding such entities grants, contracts, co-  
8       operative agreements, or cash prizes; or

9           (2) entering into such other transactions with  
10       such entities as the Secretary may prescribe in regu-  
11       lations.

12       (d) ADVISORY PANEL.—

13           (1) IN GENERAL.—The Secretary shall convene  
14       an advisory panel to advise and consult with the  
15       Secretary, the Director, and the qualified individuals  
16       appointed under subsection (b)(2) on—

17           (A) ensuring that the awards made and  
18       transaction entered into under subsection (c)  
19       are consistent with the purposes described in  
20       subsection (a)(1); and

21           (B) ensuring the relevance, accessibility,  
22       and utility of such awards and transactions to  
23       education practitioners.

1           (2) APPOINTMENT OF MEMBERS.—The Sec-  
2       retary shall appoint the following qualified individ-  
3       uals to serve on the advisory panel:

4                   (A) Education practitioners.

5                   (B) Experts in technology.

6                   (C) Specialists in rapid gains in student  
7       achievement and school turnaround.

8                   (D) Specialists in personalized learning.

9                   (E) Researchers, including at least one  
10      representative from a comprehensive center es-  
11      tablished under section 203 of the Educational  
12      Technical Assistance Act of 2002 (20 U.S.C.  
13      9602) or the regional laboratories system estab-  
14      lished under section 174 of the Education  
15      Sciences Reform Act (20 U.S.C. 9564).

16                  (F) Other individuals with expertise who  
17      will contribute to the overall rigor and quality  
18      of ARPA–ED.

19           (3) APPLICABILITY OF FACA.—The Federal Ad-  
20      visory Committee Act (5 U.S.C. App.) shall not  
21      apply to the panel convened under this subsection  
22      and any appointee to such panel shall not be consid-  
23      ered an “employee” under section 2105 of title 5,  
24      United States Code.

25      (e) EVALUATION AND DISSEMINATION.—

1           (1) EVALUATION.—The Secretary shall obtain  
2       independent, periodic, and rigorous evaluation of—

3           (A) the effectiveness of the processes  
4       ARPA–Ed is using to achieve the purposes de-  
5       scribed in subsection (a)(1);

6           (B) the relevance, accessibility, and utility  
7       of the awards made and transactions entered  
8       into under subsection (c) to education practi-  
9       tioners; and

10          (C) the effectiveness of the projects carried  
11       out through such awards and transactions,  
12       using evidence standards developed in consulta-  
13       tion with the Institute of Education Sciences,  
14       and the suitability of such projects for further  
15       investment or increased scale.

16          (2) DISSEMINATION AND USE.—The Secretary  
17       shall disseminate information to education practi-  
18       tioners, including teachers, principals, and local and  
19       State superintendents, on effective practices and  
20       technologies developed under ARPA–ED, as appro-  
21       priate, through—

22           (A) the comprehensive centers established  
23       under 203 of the Educational Technical Assist-  
24       ance Act of 2002 (20 U.S.C. 9602);

1 (B) the regional laboratories system estab-  
 2 lished under section 174 of the Education  
 3 Sciences Reform Act (20 U.S.C. 9564); and

4 (C) such other means as the Secretary de-  
 5 termines to be appropriate.

6 (f) ADMINISTRATIVE REQUIREMENTS.—Notwith-  
 7 standing section 437(d) of the General Education Provi-  
 8 sions Act (20 U.S.C. 1232(d)), the Secretary shall estab-  
 9 lish such processes as may be necessary for the Secretary  
 10 to manage and administer ARPA–ED, which are not con-  
 11 strained by other Department-wide administrative require-  
 12 ments that may prevent ARPA–ED from carrying out the  
 13 purposes described in subsection (a)(1).

14 (g) DEFINITIONS.—For purposes of this section:

15 (1) DEPARTMENT.—The term “Department”  
 16 means the Department of Education.

17 (2) DIRECTOR.—The term “Director” means  
 18 the Director of ARPA–ED.

19 (3) SECRETARY.—The term “Secretary” means  
 20 the Secretary of Education.

21 **SEC. 205. COMMUNITY COLLEGE AND INDUSTRY PARTNER-**  
 22 **SHIPS STEM PILOT GRANT PROGRAM.**

23 (a) ESTABLISHMENT.—The Secretary of Labor shall  
 24 establish a competitive grant pilot program for the pur-

1 pose of developing, offering, improving, or providing  
2 STEM education or career training programs for workers.

3 (b) ELIGIBLE ENTITY.—

4 (1) IN GENERAL.—Entities eligible for a grant  
5 under this section are any of the following (or a con-  
6 sortium of any of the following) in partnership with  
7 employers or an association of employers—

8 (A) a junior or community college (as de-  
9 fined in section 312(f) of the Higher Education  
10 Act of 1965 (20 U.S.C. 1085(f)));

11 (B) a postsecondary vocational institution  
12 (as defined in section 102(c) of the Higher  
13 Education Act of 1965 (20 U.S.C. 1002(c)));

14 (C) a four-year public institution of higher  
15 education (as defined in section 101 of the  
16 Higher Education Act of 1965 (20 U.S.C.  
17 1001)) that offers two-year degrees, will use  
18 funds provided under this section for activities  
19 at the certificate and associate degree levels,  
20 and is not reasonably close, as determined by  
21 the Secretary of Labor, to a community college;

22 (D) a tribal college or university (as de-  
23 fined in section 316(b) of the Higher Education  
24 Act of 1965 (20 U.S.C. 1059c(b))); or

1 (E) at the discretion of the Secretary of  
2 Labor, a private, not-for-profit, two-year insti-  
3 tution of higher education in Puerto Rico,  
4 Guam, the United States Virgin Islands, Amer-  
5 ican Samoa, the Commonwealth of the North-  
6 ern Mariana Islands, the Republic of the Mar-  
7 shall Islands, the Federated States of Micro-  
8 nesia, or the Republic of Palau.

9 (2) ADDITIONAL PARTNERSHIPS.—In addition  
10 to partnering with employers or an association of  
11 employers, the eligible entities described in para-  
12 graph (1) may partner with any of the following or-  
13 ganizations:

14 (A) An adult education provider or institu-  
15 tion of higher education (as defined in section  
16 101 of the Higher Education Act of 1965 (20  
17 U.S.C. 1001)).

18 (B) A community-based organization.

19 (C) A joint labor-management partnership.

20 (D) Any other organization that the Sec-  
21 retary of Labor considers appropriate.

22 (3) WORKFORCE INVESTMENT BOARD.—Any  
23 such partnership shall collaborate with, and may in-  
24 clude, the State or local workforce investment board.

1       (c) APPLICATION.—An eligible entity seeking a grant  
2 under this section shall submit a grant proposal to the  
3 Secretary of Labor at such time and containing such infor-  
4 mation as the Secretary may require. The proposal shall  
5 include, at a minimum, a detailed description of—

6           (1) the specific project for which the grant pro-  
7 posal is submitted, including the manner in which  
8 the grant will be used to develop, offer, improve, or  
9 provide a STEM education or career training pro-  
10 gram;

11          (2) the extent to which the project will meet the  
12 STEM education or career training needs of workers  
13 in the area served by the eligible entity;

14          (3) the extent to which the project will meet the  
15 needs of employers in the region for skilled workers  
16 in in-demand industry sectors and in-demand occu-  
17 pations, including high technology areas, nanotech-  
18 nology, and advanced manufacturing;

19          (4) the extent to which the project fits within  
20 any overall strategic plan developed by an eligible  
21 entity; and

22          (5) any previous experience of the eligible entity  
23 in providing STEM education or career training pro-  
24 grams, the absence of which shall not automatically

1       disqualify an eligible institution from receiving a  
2       grant under this section.

3       (d) SPECIFICATIONS OF GRANTS.—

4           (1) DURATION.—A grant shall be awarded  
5       under this section for a period of up to 36 months  
6       in duration.

7           (2) SIZE OF GRANT.—The amount of a grant  
8       awarded under this subsection may not exceed  
9       \$3,000,000 for an individual entity and \$20,000,000  
10      for a consortium.

11      (e) CRITERIA FOR AWARD.—

12           (1) IN GENERAL.—Grants under this section  
13      shall be awarded based on—

14           (A) a determination of the merits of the  
15           grant proposal submitted by the eligible entity  
16           to develop, offer, improve, or provide STEM  
17           education or career training programs to be  
18           made available to workers;

19           (B) an assessment of the likely employ-  
20           ment opportunities available in the region to in-  
21           dividuals who complete a STEM education or  
22           career training program that the eligible entity  
23           proposes to develop, offer, improve, or provide;

24           (C) an assessment of prior demand for  
25           STEM training programs by individuals eligible



1           for training served by the eligible entity as well  
2           as availability and capacity of existing STEM  
3           training programs to meet future demand for  
4           STEM training programs; and

5                   (D) any additional criteria established by  
6           the Secretary of Labor.

7           (2) PRIORITY.—The Secretary of Labor shall  
8           give priority to eligible entities that—

9                   (A) include a partnership with a business  
10           or industry or sector partnership that—

11                          (i) pays a portion of the costs of such  
12                          programs; or

13                          (ii) agrees to hire individuals who  
14                          have completed a particular postsecondary  
15                          degree, certificate, or credential resulting  
16                          from the training program of the eligible  
17                          entity;

18                   (B) enter into a partnership with a labor  
19           organization or labor-management training pro-  
20           gram that provides technical expertise for occu-  
21           pationally specific education necessary for a rec-  
22           ognized postsecondary STEM credential leading  
23           to an occupation in an in-demand industry sec-  
24           tor;

1 (C) are focused on serving individuals with  
2 barriers to employment, particularly individuals  
3 who have been unemployed for 27 weeks or  
4 longer;

5 (D) are community colleges serving areas  
6 with high unemployment rates, including rural  
7 areas; and

8 (E) are eligible entities that include an in-  
9 stitution of higher education eligible for assist-  
10 ance under title III or V of the Higher Edu-  
11 cation Act of 1965.

12 (f) USE OF FUNDS.—Grants awarded under this sec-  
13 tion shall be used for one or more of the following:

14 (1) The development, offering, improvement, or  
15 provision of STEM academic programs or training  
16 programs that provide relevant job training for  
17 skilled occupations that will meet the needs of em-  
18 ployers in in-demand industry sectors, which may in-  
19 clude registered apprenticeship programs, on-the-job  
20 training programs, and programs that support em-  
21 ployers in upgrading the skills of their workforce.

22 (2) The development and implementation of  
23 policies and programs to expand opportunities for  
24 students to earn a recognized postsecondary STEM

1 credential or degree in in-demand industry sectors  
2 and in-demand occupations, including by—

3 (A) facilitating the transfer of academic  
4 credits between institutions of higher education,  
5 including the transfer of academic credits for  
6 courses in the same field of study;

7 (B) expanding articulation agreements and  
8 policies that guarantee transfer between such  
9 institutions, including through common course  
10 numbering and general core curriculum; and

11 (C) developing or enhancing student sup-  
12 port services programs.

13 (3) The creation of workforce programs that  
14 provide a sequence of education and occupational  
15 training that leads to a recognized postsecondary  
16 STEM credential or degree, including programs  
17 that—

18 (A) blend basic skills and occupational  
19 training;

20 (B) facilitate means of transitioning from  
21 noncredit occupational, basic skills, or develop-  
22 mental coursework to for-credit coursework  
23 within and across institutions;

24 (C) build or enhance linkages including the  
25 development of dual enrollment programs and

1 early college high schools between secondary  
2 education or adult education programs (includ-  
3 ing programs established under the Carl D.  
4 Perkins Career and Technical Education Act of  
5 2006);

6 (D) implement other innovative programs  
7 designed to increase the provision of training  
8 for students, including students who are vet-  
9 eran members of the National Guard or Re-  
10 serves, to enter skilled occupations in in-de-  
11 mand industry sectors; and

12 (E) support paid internships that will allow  
13 students to simultaneously earn credit for work-  
14 based learning and gain relevant employment  
15 experience in an in-demand industry sector or  
16 in-demand occupation, which shall include op-  
17 portunities that transition individuals into em-  
18 ployment.

19 (4) The support of regional or national in-de-  
20 mand industry sectors to develop skills consortia  
21 that will identify pressing workforce needs and de-  
22 velop solutions such as—

23 (A) standardizing industry certifications;

24 (B) developing new training technologies;

25 and

1 (C) collaborating with industry employers  
2 to define and describe how specific skills lead to  
3 particular jobs and career opportunities.

4 (g) AUTHORIZATIONS OF APPROPRIATIONS.—There  
5 are authorized to be appropriated to the Secretary of  
6 Labor \$100,000,000 for each of fiscal years 2014 through  
7 2016 to carry out this section.

8 (h) DEFINITIONS.—For the purposes of this sec-  
9 tion—

10 (1) the term “in-demand industry sector”  
11 means an industry sector that has a substantial cur-  
12 rent or potential impact (including through jobs that  
13 lead to economic self-sufficiency and opportunities  
14 for advancement) on the State, regional, or local  
15 economy, as appropriate, and that contributes to the  
16 growth or stability of other supporting businesses, or  
17 the growth of other industry sectors; and

18 (2) the term “in-demand occupation” means an  
19 occupation that currently has or is projected to have  
20 a number of positions (including positions that lead  
21 to economic self-sufficiency and opportunities for ad-  
22 vancement) in an industry sector so as to have a sig-  
23 nificant impact on the State, regional, or local econ-  
24 omy.

1 **SEC. 206. NATIONAL RESEARCH COUNCIL REPORT ON**  
2 **STEAM EDUCATION.**

3 (a) SENSE OF CONGRESS.—It is the sense of Con-  
4 gress that—

5 (1) the Science, Technology, Engineering, and  
6 Mathematics (STEM) Talent Expansion Program  
7 set an important goal of increasing the number of  
8 students graduating with associate or baccalaureate  
9 degrees in the STEM fields, and this should con-  
10 tinue to be a focus of that program;

11 (2) to further the goal of the STEM Talent Ex-  
12 pansion Program, as well as STEM education pro-  
13 motion programs across the Federal Government, in-  
14 novative approaches are needed to enhance STEM  
15 education in the United States;

16 (3) STEAM, which is the integration of arts  
17 and design, broadly defined, into Federal STEM  
18 programming, research, and innovation activities, is  
19 a method-validated approach to maintaining the  
20 competitiveness of the United States in both work-  
21 force and innovation and to increasing and broad-  
22 ening students' engagement in the STEM fields;

23 (4) STEM graduates need more than technical  
24 skills to thrive in the 21st century workforce; they  
25 also need to be creative, innovative, collaborative,  
26 and able to think critically;

1           (5) STEAM should be recognized as providing  
2       value to STEM research and education programs  
3       across Federal agencies, without supplanting the  
4       focus on the traditional STEM disciplines;

5           (6) Federal agencies should work cooperatively  
6       on interdisciplinary initiatives to support the inte-  
7       gration of arts and design into STEM, and current  
8       interdisciplinary programs should be strengthened;

9           (7) Federal agencies should allow for STEAM  
10      activities under current and future grant-making  
11      and other activities; and

12          (8) Federal agencies should clarify that, where  
13      appropriate, data collection, surveys, and reporting  
14      on STEM activities and grant-making should exam-  
15      ine activities that involve cross-disciplinary learning  
16      that integrates specialized skills and expertise from  
17      both art and science.

18      (b) NATIONAL RESEARCH COUNCIL WORKSHOP.—  
19      The National Science Foundation shall enter into an ar-  
20      rangement with the National Research Council to conduct  
21      a workshop on the integration of arts and design with  
22      STEM education. The workshop shall include a discussion  
23      of—

24          (1) how the perspectives and experience of art-  
25      ists and designers may contribute to the advance-

1       ment of science, engineering, and innovation, for ex-  
2       ample through the development of visualization aids  
3       for large experimental and computational data sets;

4           (2) how arts and design-based education experi-  
5       ences might support formal and informal STEM  
6       education at the pre-K–12 level, particularly in fos-  
7       tering creativity and risk taking, and encourage  
8       more students to pursue STEM studies, including  
9       students from groups historically underrepresented  
10      in STEM;

11          (3) how the teaching of design principles can be  
12      better integrated into undergraduate engineering  
13      and other STEM curricula, including in the first two  
14      years of undergraduate studies, to enhance student  
15      capacity for creativity and innovation and improve  
16      student retention, including students from groups  
17      historically underrepresented in STEM; and

18          (4) what additional steps, if any, Federal  
19      science agencies should take to promote the inclu-  
20      sion of arts and design principles in their respective  
21      STEM programs and activities in order to improve  
22      student STEM learning outcomes, increase the re-  
23      cruitment and retention of students into STEM  
24      studies and careers, and increase innovation in the  
25      United States.



1 (c) REPORT.—Not later than 18 months after the  
2 date of enactment of this Act, the National Research  
3 Council shall submit a report to Congress providing a  
4 summary description of the discussion and findings from  
5 the workshop required under subsection (b).

6 **SEC. 207. ENGAGING FEDERAL SCIENTISTS AND ENGI-**  
7 **NEERS IN STEM EDUCATION.**

8 The Director of the Office of Science and Technology  
9 Policy shall develop guidance for Federal agencies to in-  
10 crease opportunities and training, as appropriate, for Fed-  
11 eral scientists and engineers to participate in STEM en-  
12 gagement activities through their respective agencies and  
13 in their communities.

14 **Subtitle B—Broadening**  
15 **Participation in STEM**

16 **SEC. 211. SHORT TITLE.**

17 This subtitle may be cited as the “STEM Opportuni-  
18 ties Act of 2014”.

19 **SEC. 212. PURPOSE.**

20 (a) IN GENERAL.—The Director of the Office of  
21 Science and Technology Policy, acting through the Fed-  
22 eral science agencies, shall carry out programs and activi-  
23 ties with the purpose of ensuring that Federal science  
24 agencies and institutions of higher education receiving

1 Federal research and development funding are fully en-  
2 gaging their entire talent pool.

3 (b) PURPOSES.—The purposes of this subtitle are as  
4 follows:

5 (1) To promote research on and increase under-  
6 standing of the participation and trajectories of  
7 women and underrepresented minorities in STEM  
8 careers at institutions of higher education and Fed-  
9 eral science agencies, including Federal laboratories.

10 (2) To raise awareness within Federal science  
11 agencies, including Federal laboratories, and institu-  
12 tions of higher education about cultural and institu-  
13 tional barriers limiting the recruitment, retention,  
14 promotion, and other indicators of participation and  
15 achievement of women and underrepresented minori-  
16 ties in academic and Government STEM research  
17 careers at all levels.

18 (3) To identify, disseminate, and implement  
19 best practices at Federal science agencies, including  
20 Federal laboratories, and at institutions of higher  
21 education to remove or reduce cultural and institu-  
22 tional barriers limiting the recruitment, retention,  
23 and success of women and underrepresented minori-  
24 ties in academic and Government STEM research  
25 careers.

1           (4) To provide grants to institutions of higher  
2           education to recruit, retain, and advance STEM fac-  
3           ulty members from underrepresented minority  
4           groups and to implement or expand reforms in un-  
5           dergraduate STEM education in order to increase  
6           the number of students from underrepresented mi-  
7           nority groups receiving degrees in these fields.

8   **SEC. 213. FEDERAL SCIENCE AGENCY POLICIES FOR CARE-**  
9                           **GIVERS.**

10          (a) OSTP GUIDANCE.—Not later than 6 months  
11          after the date of enactment of this Act, the Director of  
12          the Office of Science and Technology Policy shall provide  
13          guidance to Federal science agencies to establish policies  
14          that—

15                (1) apply to all—

16                    (A) intramural and extramural research  
17                    awards; and

18                    (B) primary investigators who have  
19                    caregiving responsibilities, including care for a  
20                    newborn or newly adopted child and care for an  
21                    immediate family member who is sick or dis-  
22                    abled; and

23                (2) provide—

24                    (A) flexibility in timing for the initiation of  
25                    approved research awards;

1 (B) no-cost extensions of research awards;

2 (C) grant supplements as appropriate to  
3 research awards for research technicians or  
4 equivalent to sustain research activities; and

5 (D) any other appropriate accommodations  
6 at the discretion of the head of each agency.

7 (b) UNIFORMITY OF GUIDANCE.—In providing such  
8 guidance, the Director of the Office of Science and Tech-  
9 nology Policy shall encourage uniformity and consistency  
10 in the policies across all agencies.

11 (c) ESTABLISHMENT OF POLICIES.—Consistent with  
12 the guidance provided under this section, Federal science  
13 agencies shall maintain or develop and implement policies  
14 for caregivers and shall broadly disseminate such policies  
15 to current and potential grantees.

16 (d) DATA ON USAGE.—Federal science agencies  
17 shall—

18 (1) collect data on the usage of the policies  
19 under subsection (c), by gender, at both institutions  
20 of higher education and Federal laboratories; and

21 (2) report such data on an annual basis to the  
22 Director of the Office of Science and Technology  
23 Policy in such form as required by the Director.

1 **SEC. 214. COLLECTION AND REPORTING OF DATA ON FED-**  
2 **ERAL RESEARCH GRANTS.**

3 (a) COLLECTION OF DATA.—

4 (1) IN GENERAL.—Each Federal science agency  
5 shall collect standardized record-level annual infor-  
6 mation on demographics, primary field, award type,  
7 budget request, funding outcome, and awarded  
8 budget for all applications for merit-reviewed re-  
9 search and development grants to institutions of  
10 higher education and Federal laboratories supported  
11 by that agency.

12 (2) UNIFORMITY AND STANDARDIZATION.—The  
13 Director of the Office of Science and Technology  
14 Policy shall establish a policy to ensure uniformity  
15 and standardization of the data collection required  
16 under paragraph (1).

17 (3) RECORD-LEVEL DATA.—

18 (A) REQUIREMENT.—On an annual basis,  
19 beginning with the deadline under subpara-  
20 graph (C), each Federal science agency shall  
21 submit to the Director of the National Science  
22 Foundation record-level data collected under  
23 paragraph (1) in the form required by such Di-  
24 rector.

25 (B) PREVIOUS DATA.—As part of the first  
26 submission under subparagraph (A), each Fed-

1           eral science agency, to the extent practicable,  
2           shall also submit comparable record-level data  
3           for the 5 years preceding the deadline under  
4           subparagraph (C).

5           (C) DEADLINE.—The deadline under this  
6           paragraph is 2 years after the date of enact-  
7           ment of this Act.

8           (b) REPORTING OF DATA.—The Director of the Na-  
9           tional Science Foundation shall publish statistical sum-  
10          mary data collected under this section, disaggregated and  
11          cross-tabulated by race, ethnicity, gender, age, and years  
12          since completion of doctoral degree, including in conjunc-  
13          tion with the National Science Foundation’s report re-  
14          quired by section 37 of the Science and Technology Equal  
15          Opportunities Act (42 U.S.C. 1885d; Public Law 96–  
16          516).

17   **SEC. 215. POLICIES FOR REVIEW OF FEDERAL RESEARCH**  
18                           **GRANTS.**

19          (a) IN GENERAL.—The Director of the Office of  
20          Science and Technology Policy, in collaboration with the  
21          Director of the National Science Foundation, shall identify  
22          information and best practices useful for educating pro-  
23          gram officers and members of standing peer review com-  
24          mittees at Federal science agencies about—

1           (1) research on implicit bias based on gender,  
2           race, or ethnicity; and

3           (2) methods to minimize the effect of such bias  
4           in the review of extramural and intramural Federal  
5           research grants.

6           (b) GUIDANCE TO ALL FEDERAL SCIENCE AGEN-  
7           CIES.—The Director of the Office of Science and Tech-  
8           nology Policy shall disseminate the information and best  
9           practices identified in subsection (a) to all Federal science  
10          agencies and provide guidance as necessary on policies to  
11          implement such practices within each agency.

12          (c) ESTABLISHMENT OF POLICIES.—Consistent with  
13          the guidance provided in subsection (b), Federal science  
14          agencies shall maintain or develop and implement policies  
15          and practices to minimize the effects of implicit bias in  
16          the review of extramural and intramural Federal research  
17          grants.

18          (d) REPORT TO CONGRESS.—Not later than 2 years  
19          after the date of enactment of this Act, the Director of  
20          the Office of Science and Technology Policy shall report  
21          to Congress on what steps all Federal science agencies  
22          have taken to implement policies and practices to minimize  
23          the effects of bias in the review of extramural and intra-  
24          mural Federal research grants.

1 **SEC. 216. COLLECTION OF DATA ON DEMOGRAPHICS OF**  
2 **FACULTY.**

3 (a) COLLECTION OF DATA.—

4 (1) IN GENERAL.—Not later than 3 years after  
5 the date of enactment of this Act, and at least every  
6 5 years thereafter, the Director of the National  
7 Science Foundation shall carry out a survey to col-  
8 lect institution-level data on the demographics of  
9 STEM faculty, by broad fields of STEM, at dif-  
10 ferent types of institutions of higher education.

11 (2) CONSIDERATIONS.—To the extent prac-  
12 ticable, the Director of the National Science Foun-  
13 dation shall consider, by gender, race, ethnicity, citi-  
14 zenship status, age, and years since completion of  
15 doctoral degree—

16 (A) the number and percentage of faculty;

17 (B) the number and percentage of faculty  
18 at each rank;

19 (C) the number and percentage of faculty  
20 who are in nontenure-track positions, including  
21 teaching and research;

22 (D) the number and percentage of faculty  
23 who are reviewed for promotion, including ten-  
24 ure, and the percentage of that number who are  
25 promoted, including being awarded tenure;

26 (E) faculty years in rank;



1 (F) the number and percentage of faculty  
2 to leave tenure-track positions;

3 (G) the number and percentage of faculty  
4 hired, by rank; and

5 (H) the number and percentage of faculty  
6 in leadership positions.

7 (b) EXISTING SURVEYS.—The Director of the Na-  
8 tional Science Foundation—

9 (1) may carry out the requirements under sub-  
10 section (a) by collaborating with statistical centers  
11 at other Federal agencies to modify or expand, as  
12 necessary, existing Federal surveys of higher edu-  
13 cation; or

14 (2) may award a grant or contract to an insti-  
15 tution of higher education or other nonprofit organi-  
16 zation to design and carry out the requirements  
17 under subsection (a).

18 (c) REPORTING DATA.—The Director of the National  
19 Science Foundation shall publish statistical summary data  
20 collected under this section, including as part of the Na-  
21 tional Science Foundation's report required by section 37  
22 of the Science and Technology Equal Opportunities Act  
23 (42 U.S.C. 1885d; Public Law 96–516).

24 (d) AUTHORIZATION OF APPROPRIATIONS.—There  
25 are authorized to be appropriated to the Director of the

1 National Science Foundation \$3,000,000 for each of fiscal  
2 years 2014 through 2016 to develop and carry out the  
3 initial survey required in subsection (a).

4 **SEC. 217. CULTURAL AND INSTITUTIONAL BARRIERS TO EX-**  
5 **PANDING THE ACADEMIC AND FEDERAL**  
6 **STEM WORKFORCE.**

7 (a) BEST PRACTICES AT INSTITUTIONS OF HIGHER  
8 EDUCATION.—

9 (1) DEVELOPMENT OF GUIDANCE.—Not later  
10 than 6 months after the date of enactment of this  
11 Act, the Director of the National Science Founda-  
12 tion shall develop written guidance for institutions of  
13 higher education on the best practices for—

14 (A) conducting periodic campus culture  
15 surveys of STEM departments, with a par-  
16 ticular focus on identifying any cultural or in-  
17 stitutional barriers to or successful enablers for  
18 the recruitment, retention, promotion, and  
19 other indicators of participation and achieve-  
20 ment, of women and underrepresented minori-  
21 ties in STEM degree programs and academic  
22 STEM careers; and

23 (B) providing educational opportunities, in-  
24 cluding workshops as described in subsection  
25 (c), for STEM faculty and administrators to

1           learn about current research on implicit bias in  
2           recruitment, evaluation, and promotion of fac-  
3           ulty in STEM and recruitment and evaluation  
4           of undergraduate and graduate students in  
5           STEM degree programs.

6           (2) EXISTING GUIDANCE.—In developing the  
7           guidance in paragraph (1), the Director of the Na-  
8           tional Science Foundation shall utilize guidance al-  
9           ready developed by the National Aeronautics and  
10          Space Administration, the Department of Energy,  
11          and the Department of Education.

12          (3) DISSEMINATION OF GUIDANCE.—The Direc-  
13          tor of the National Science Foundation shall broadly  
14          disseminate the guidance developed in paragraph (1)  
15          to institutions of higher education that receive Fed-  
16          eral research funding.

17          (4) REPORTS TO THE NATIONAL SCIENCE  
18          FOUNDATION.—The Director of the National Science  
19          Foundation shall develop a policy that—

20                (A) applies to, at a minimum, the institu-  
21                tions classified by the Carnegie Foundation for  
22                the Advancement of Teaching on January 1,  
23                2013, as a doctorate-granting university with a  
24                very high level of research activity; and

(B) requires each institution identified in subparagraph (A), not later than 3 years after the date of enactment of this Act, to report to the Director of the National Science Foundation on activities and policies developed and implemented based on the guidance provided in paragraph (1).

(b) BEST PRACTICES AT FEDERAL LABORATORIES.—

(1) DEVELOPMENT OF GUIDANCE.—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 written guidance for Federal laboratories to develop and implement practices and policies to—

(A) conduct periodic laboratorywide culture surveys of research personnel at all levels, with a particular focus on identifying any cultural or institutional barriers to the recruitment, retention, and success of women and underrepresented minorities in STEM careers at Federal laboratories; and

(B) provide educational opportunities, including workshops as described in subsection (c), for STEM research personnel to learn

1           about current research in implicit bias in re-  
2           cruitment, evaluation, and promotion of re-  
3           search personnel at Federal laboratories.

4           (2) ESTABLISHMENT OF POLICIES.—Consistent  
5           with the guidance provided in paragraph (1), Fed-  
6           eral science agencies with Federal laboratories shall  
7           maintain or develop and implement policies for their  
8           respective Federal laboratories.

9           (c) WORKSHOPS TO ADDRESS CULTURAL BARRIERS  
10          TO EXPANDING THE ACADEMIC AND FEDERAL STEM  
11          WORKFORCE.—

12           (1) IN GENERAL.—Not later than 6 months  
13           after the date of enactment of this Act, the Director  
14           of the National Science Foundation shall recommend  
15           a uniform policy for Federal science agencies to  
16           carry out a program of workshops that educate  
17           STEM department chairs at institutions of higher  
18           education, senior managers at Federal laboratories,  
19           and other federally funded researchers about meth-  
20           ods that minimize the effects of implicit bias in the  
21           career advancement, including hiring, tenure, pro-  
22           motion, and selection for any honor based in part on  
23           the recipient's research record, of academic and Fed-  
24           eral STEM researchers.

1           (2) INTERAGENCY COORDINATION.—The Direc-  
2           tor of the National Science Foundation shall ensure  
3           that workshops supported under this subsection are  
4           coordinated across Federal science agencies and  
5           jointly supported as appropriate.

6           (3) MINIMIZING COSTS.—To the extent prac-  
7           ticable, workshops shall be held in conjunction with  
8           national or regional STEM disciplinary meetings to  
9           minimize costs associated with participant travel.

10          (4) PRIORITY FIELDS FOR ACADEMIC PARTICI-  
11          PANTS.—In considering the participation of STEM  
12          department chairs and other academic researchers,  
13          the Director of the National Science Foundation  
14          shall prioritize workshops for the broad fields of  
15          STEM in which the national rate of representation  
16          of women among tenured or tenure-track faculty or  
17          non-faculty researchers at doctorate-granting institu-  
18          tions of higher education is less than 25 percent, ac-  
19          cording to the most recent data available from the  
20          National Center for Science and Engineering Statis-  
21          tics.

22          (5) ORGANIZATIONS ELIGIBLE TO CARRY OUT  
23          WORKSHOPS.—Federal science agencies may carry  
24          out the program of workshops under this subsection  
25          by making grants to eligible organizations. In addi-

tion 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 or underrepresented minorities in STEM.

(6) 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 STEM discipline or disciplines 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; and

(ii) in the case of Federal laboratories, individuals with personnel management re-

1           sponsibilities comparable to those of an in-  
2           stitution of higher education department  
3           chair.

4           (B) Activities at the workshops shall in-  
5           clude research presentations and interactive dis-  
6           cussions or other activities that increase the  
7           awareness of the existence of implicit bias in re-  
8           cruitment, hiring, tenure review, promotion, and  
9           other forms of formal recognition of individual  
10          achievement for faculty and other federally  
11          funded STEM researchers and shall provide  
12          strategies to overcome such bias.

13          (C) Research presentations and other  
14          workshop programs, as appropriate, shall in-  
15          clude a discussion of the unique challenges  
16          faced by underrepresented subgroups, including  
17          minority women, minority men, and first gen-  
18          eration minority graduates in research.

19          (D) Workshop programs shall include in-  
20          formation on best practices for mentoring un-  
21          dergraduate and graduate women and under-  
22          represented minority students.

23          (7) DATA ON WORKSHOPS.—Any proposal for  
24          funding by an organization seeking to carry out a



1 workshop under this subsection shall include a de-  
2 scription of how such organization will—

3 (A) collect data on the rates of attendance  
4 by invitees in workshops, including information  
5 on the home institution and department of  
6 attendees, and the rank of faculty attendees;

7 (B) conduct attitudinal surveys on work-  
8 shop attendees before and after the workshops;  
9 and

10 (C) collect follow-up data on any relevant  
11 institutional policy or practice changes reported  
12 by attendees not later than 1 year after attend-  
13 ance in such a workshop.

14 (8) REPORT TO NSF.—Organizations receiving  
15 funding to carry out workshops under this sub-  
16 section shall report the data required in paragraph  
17 (7) to the Director of the National Science Founda-  
18 tion in such form as required by such Director.

19 (d) REPORT TO CONGRESS.—Not later than 4 years  
20 after the date of enactment of this Act, the Director of  
21 the National Science Foundation shall submit a report to  
22 Congress that includes—

23 (1) a summary and analysis of the types and  
24 frequency of activities and policies developed and  
25 carried out under subsection (a) based on the re-

(2) a description and evaluation of the status and effectiveness of the program of workshops required under subsection (c), including a summary of any data reported under paragraph (8) of such subsection.

(e) AUTHORIZATION OF APPROPRIATIONS.—There are authorized to be appropriated to the Director of the National Science Foundation \$2,000,000 for each of fiscal years 2014 through 2018 to carry out this section.

12 SEC. 218. RESEARCH AND DISSEMINATION AT THE NA-  
13 TIONAL SCIENCE FOUNDATION.

(a) IN GENERAL.—The Director of the National Science Foundation shall award research grants and carry out dissemination activities consistent with the purposes of this subtitle, including—

(1) research grants to analyze the record-level data collected under section 214 and section 216, consistent with policies to ensure the privacy of individuals identifiable by such data;

(2) research grants to study best practices for work-life accommodation;

(3) research grants to study the impact of policies and practices that are implemented under this

1 subtitle or that are otherwise consistent with the  
2 purposes of this subtitle;

3 (4) collaboration with other Federal science  
4 agencies and professional associations to exchange  
5 best practices, harmonize work-life accommodation  
6 policies and practices, and overcome common bar-  
7 riers to work-life accommodation; and

8 (5) collaboration with institutions of higher  
9 education in order to clarify and catalyze the adop-  
10 tion of a coherent and consistent set of work-life ac-  
11 commodation policies and practices.

12 (b) AUTHORIZATION OF APPROPRIATIONS.—There  
13 are authorized to be appropriated to the Director of the  
14 National Science Foundation \$5,000,000 for each of fiscal  
15 years 2014 through 2018 to carry out this section.

16 **SEC. 219. REPORT TO CONGRESS.**

17 Not later than 4 years after the date of enactment  
18 of this Act, the Director of the Office of Science and Tech-  
19 nology Policy shall submit a report to Congress that in-  
20 cludes—

21 (1) a description and evaluation of the status  
22 and usage of caregiver policies at all Federal science  
23 agencies, including any recommendations for revis-  
24 ing or expanding such policies;

1           (2) a description of any significant updates to  
 2           the policies for review of Federal research grants re-  
 3           quired under section 215, and any evidence of the  
 4           impact of such policies on the review or awarding of  
 5           Federal research grants; and

6           (3) a description and evaluation of the status of  
 7           Federal laboratory policies and practices required  
 8           under section 217(b), including any recommenda-  
 9           tions for revising or expanding such policies.

10 **SEC. 220. NATIONAL SCIENCE FOUNDATION SUPPORT FOR**  
 11 **INCREASING DIVERSITY AMONG STEM FAC-**  
 12 **ULTY AT INSTITUTIONS OF HIGHER EDU-**  
 13 **CATION.**

14           (a) GRANTS.—The Director of the National Science  
 15 Foundation shall award grants to institutions of higher  
 16 education (or consortia thereof) for the development of in-  
 17 novative reform efforts designed to increase the recruit-  
 18 ment, retention, and advancement of individuals from  
 19 underrepresented minority groups in academic STEM ca-  
 20 reers.

21           (b) MERIT REVIEW; COMPETITION.—Grants shall be  
 22 awarded under this section on a merit-reviewed, competi-  
 23 tive basis.

24           (c) USE OF FUNDS.—Activities supported by grants  
 25 under this section may include—

1           (1) institutional assessment activities, such as  
2       data analyses and policy review, in order to identify  
3       and address specific issues in the recruitment, reten-  
4       tion, and advancement of faculty members from  
5       underrepresented minority groups;

6           (2) implementation of institution-wide improve-  
7       ments in workload distribution, such that faculty  
8       members from underrepresented minority groups are  
9       not disadvantaged in the amount of time available to  
10      focus on research, publishing papers, and engaging  
11      in other activities required to achieve tenure status  
12      and run a productive research program;

13          (3) development and implementation of training  
14      courses for administrators and search committee  
15      members to ensure that candidates from underrep-  
16      resented minority groups are not subject to implicit  
17      biases in the search and hiring process;

18          (4) development and hosting of intra- or inter-  
19      institutional workshops to propagate best practices  
20      in recruiting, retaining, and advancing faculty mem-  
21      bers from underrepresented minority groups;

22          (5) professional development opportunities for  
23      faculty members from underrepresented minority  
24      groups;

1           (6) activities aimed at making undergraduate  
2     STEM students from underrepresented minority  
3     groups aware of opportunities for academic careers  
4     in STEM fields;

5           (7) activities to identify and engage exceptional  
6     graduate students from underrepresented minority  
7     groups at various stages of their studies and to en-  
8     courage them to enter academic careers; and

9           (8) other activities consistent with subsection  
10    (a), as determined by the Director of the National  
11    Science Foundation.

12   (d) SELECTION PROCESS.—

13           (1) APPLICATION.—An institution of higher  
14    education (or consortia thereof) seeking funding  
15    under this section shall submit an application to the  
16    Director of the National Science Foundation at such  
17    time, in such manner, and containing such informa-  
18    tion and assurances as such Director may require.  
19    The application shall include, at a minimum, a de-  
20    scription of—

21           (A) the reform effort that is being pro-  
22           posed for implementation by the institution of  
23           higher education;

24           (B) any available evidence of specific dif-  
25           ficulties in the recruitment, retention, and ad-

1           vancement of faculty members from underrep-  
2           resented minority groups in STEM academic  
3           careers within the institution of higher edu-  
4           cation submitting an application, and how the  
5           proposed reform effort would address such  
6           issues;

7           (C) how the institution of higher education  
8           submitting an application plans to sustain the  
9           proposed reform effort beyond the duration of  
10          the grant; and

11          (D) how the success and effectiveness of  
12          the proposed reform effort will be evaluated and  
13          assessed in order to contribute to the national  
14          knowledge base about models for catalyzing in-  
15          stitutional change.

16          (2) REVIEW OF APPLICATIONS.—In selecting  
17          grant recipients under this section, the Director of  
18          the National Science Foundation shall consider, at a  
19          minimum—

20                (A) the likelihood of success in under-  
21                taking the proposed reform effort at the institu-  
22                tion of higher education submitting the applica-  
23                tion, including the extent to which the adminis-  
24                trators of the institution are committed to mak-  
25                ing the proposed reform effort a priority;

1           (B) the degree to which the proposed re-  
2           form effort will contribute to change in institu-  
3           tional culture and policy such that greater value  
4           is placed on the recruitment, retention, and ad-  
5           vancement of faculty members from underrep-  
6           resented minority groups;

7           (C) the likelihood that the institution of  
8           higher education will sustain or expand the pro-  
9           posed reform effort beyond the period of the  
10          grant; and

11          (D) the degree to which evaluation and as-  
12          sessment plans are included in the design of the  
13          proposed reform effort.

14          (3) GRANT DISTRIBUTION.—The Director of  
15          the National Science Foundation shall ensure, to the  
16          extent practicable, that grants awarded under this  
17          section are made to a variety of types of institutions  
18          of higher education.

19          (e) AUTHORIZATION OF APPROPRIATIONS.—There  
20          are authorized to be appropriated to the Director of the  
21          National Science Foundation \$10,000,000 for each of fis-  
22          cal years 2014 through 2018 to carry out this section.



1 **SEC. 221. NATIONAL SCIENCE FOUNDATION SUPPORT FOR**  
2 **BROADENING PARTICIPATION IN UNDER-**  
3 **GRADUATE STEM EDUCATION.**

4 (a) GRANTS.—The Director of the National Science  
5 Foundation shall award grants to institutions of higher  
6 education (or consortia thereof) to implement or expand  
7 research-based reforms in undergraduate STEM edu-  
8 cation for the purpose of recruiting and retaining students  
9 from minority groups who are underrepresented in STEM  
10 fields, with a priority focus on natural science and engi-  
11 neering fields.

12 (b) MERIT REVIEW; COMPETITION.—Grants shall be  
13 awarded under this section on a merit-reviewed, competi-  
14 tive basis.

15 (c) USE OF FUNDS.—Activities supported by grants  
16 under this section may include—

17 (1) implementation or expansion of innovative,  
18 research-based approaches to broaden participation  
19 of underrepresented minority groups in STEM  
20 fields;

21 (2) implementation or expansion of bridge, co-  
22 hort, tutoring, or mentoring programs designed to  
23 enhance the recruitment and retention of students  
24 from underrepresented minority groups in STEM  
25 fields;

1           (3) implementation or expansion of outreach  
2       programs linking institutions of higher education  
3       and K–12 school systems in order to heighten  
4       awareness among pre-college students from under-  
5       represented minority groups of opportunities in col-  
6       lege-level STEM fields and STEM careers;

7           (4) implementation or expansion of faculty de-  
8       velopment programs focused on improving retention  
9       of undergraduate STEM students from underrep-  
10      resented minority groups;

11          (5) implementation or expansion of mechanisms  
12      designed to recognize and reward faculty members  
13      who demonstrate a commitment to increasing the  
14      participation of students from underrepresented mi-  
15      nority groups in STEM fields;

16          (6) expansion of successful reforms aimed at in-  
17      creasing the number of STEM students from under-  
18      represented minority groups beyond a single course  
19      or group of courses to achieve reform within an en-  
20      tire academic unit, or expansion of successful reform  
21      efforts beyond a single academic unit to other  
22      STEM academic units within an institution of high-  
23      er education;

24          (7) expansion of opportunities for students from  
25      underrepresented minority groups to conduct STEM

1 research in industry, at Federal laboratories, and at  
2 international research institutions or research sites;

3 (8) provision of stipends for students from  
4 underrepresented minority groups participating in  
5 research;

6 (9) development of research collaborations be-  
7 tween research-intensive universities and primarily  
8 undergraduate minority-serving institutions;

9 (10) support for graduate students and post-  
10 doctoral fellows from underrepresented minority  
11 groups to participate in instructional or assessment  
12 activities at primarily undergraduate institutions, in-  
13 cluding primarily undergraduate minority-serving in-  
14 stitutions and two-year institutions of higher edu-  
15 cation; and

16 (11) other activities consistent with subsection  
17 (a), as determined by the Director of the National  
18 Science Foundation.

19 (d) SELECTION PROCESS.—

20 (1) APPLICATION.—An institution of higher  
21 education (or consortium thereof) seeking a grant  
22 under this section shall submit an application to the  
23 Director of the National Science Foundation at such  
24 time, in such manner, and containing such informa-

1       tion and assurances as such Director may require.

2       The application shall include, at a minimum—

3               (A) a description of the proposed reform  
4       effort;

5               (B) a description of the research findings  
6       that will serve as the basis for the proposed re-  
7       form effort or, in the case of applications that  
8       propose an expansion of a previously imple-  
9       mented reform, a description of the previously  
10      implemented reform effort, including data about  
11      the recruitment, retention, and academic  
12      achievement of students from underrepresented  
13      minority groups;

14              (C) evidence of an institutional commit-  
15      ment to, and support for, the proposed reform  
16      effort, including a long-term commitment to im-  
17      plement successful strategies from the current  
18      reform beyond the academic unit or units in-  
19      cluded in the grant proposal;

20              (D) a description of existing or planned in-  
21      stitutional policies and practices regarding fac-  
22      ulty hiring, promotion, tenure, and teaching as-  
23      signment that reward faculty contributions to  
24      improving the education of students from

1 underrepresented minority groups in STEM;  
2 and

3 (E) how the success and effectiveness of  
4 the proposed reform effort will be evaluated and  
5 assessed in order to contribute to the national  
6 knowledge base about models for catalyzing in-  
7 stitutional change.

8 (2) REVIEW OF APPLICATIONS.—In selecting  
9 grant recipients under this section, the Director of  
10 the National Science Foundation shall consider, at a  
11 minimum—

12 (A) the likelihood of success of the pro-  
13 posed reform effort at the institution submit-  
14 ting the application, including the extent to  
15 which the faculty, staff, and administrators of  
16 the institution are committed to making the  
17 proposed institutional reform a priority of the  
18 participating academic unit or units;

19 (B) the degree to which the proposed re-  
20 form effort will contribute to change in institu-  
21 tional culture and policy such that greater value  
22 is placed on faculty engagement in the retention  
23 of students from underrepresented minority  
24 groups;

1 (C) the likelihood that the institution will  
 2 sustain or expand the proposed reform effort  
 3 beyond the period of the grant; and

4 (D) the degree to which evaluation and as-  
 5 sessment plans are included in the design of the  
 6 proposed reform effort.

7 (3) PRIORITY.—For applications that include  
 8 an expansion of existing reforms beyond a single  
 9 academic unit, the Director of the National Science  
 10 Foundation shall give priority to applications for  
 11 which a senior institutional administrator, such as a  
 12 dean or other administrator of equal or higher rank,  
 13 serves as the principal investigator.

14 (4) GRANT DISTRIBUTION.—The Director of  
 15 the National Science Foundation shall ensure, to the  
 16 extent practicable, that grants awarded under this  
 17 section are made to a variety of types of institutions  
 18 of higher education, including two-year and minor-  
 19 ity-serving institutions of higher education.

20 (e) EDUCATION RESEARCH.—

21 (1) IN GENERAL.—All grants made under this  
 22 section shall include an education research compo-  
 23 nent that will support the design and implementa-  
 24 tion of a system for data collection and evaluation  
 25 of proposed reform efforts in order to build the

1 knowledge base on promising models for increasing  
2 recruitment and retention of students from under-  
3 represented minority groups in STEM education at  
4 the undergraduate level across a diverse set of insti-  
5 tutions.

6 (2) DISSEMINATION.—The Director of the Na-  
7 tional Science Foundation shall coordinate with rel-  
8 evant Federal agencies in disseminating the results  
9 of the research under this subsection to ensure that  
10 best practices in broadening participation in STEM  
11 education at the undergraduate level are made read-  
12 ily available to all institutions of higher education,  
13 other Federal agencies that support STEM pro-  
14 grams, non-Federal funders of STEM education,  
15 and the general public.

16 (f) AUTHORIZATION OF APPROPRIATIONS.—There  
17 are authorized to be appropriated to the Director of the  
18 National Science Foundation \$15,000,000 for each of fis-  
19 cal years 2014 through 2018 to carry out this section.

20 **SEC. 222. DEFINITIONS.**

21 (a) THIS SUBTITLE.—In this subtitle:

22 (1) FEDERAL LABORATORY.—The term “Fed-  
23 eral laboratory” has the meaning given such term in  
24 section 4 of the Stevenson-Wydler Technology Inno-  
25 vation Act of 1980 (15 U.S.C. 3703).

1           (2) FEDERAL SCIENCE AGENCY.—The term  
2           “Federal science agency” means any Federal agency  
3           with at least \$100,000,000 in research and develop-  
4           ment expenditures in fiscal year 2012.

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

9           (4) STEM.—The term “STEM” means science,  
10          technology, engineering, and mathematics, including  
11          computer science.

12          (b) NATIONAL SCIENCE FOUNDATION AUTHORIZA-  
13          TION ACT OF 2002.—Section 4 of the National Science  
14          Foundation Authorization Act of 2002 (42 U.S.C. 1862n  
15          note) is amended—

16               (1) by redesignating paragraph (16) as para-  
17               graph (17); and

18               (2) by inserting after paragraph (15) the fol-  
19               lowing new paragraph:

20               “(16) STEM.—The term ‘STEM’ means  
21               science, technology, engineering, and mathematics,  
22               including computer science.”.



1 **TITLE III—NATIONAL SCIENCE**  
2 **FOUNDATION**

3 **Subtitle A—General Provisions**

4 **SEC. 301. AUTHORIZATION OF APPROPRIATIONS.**

5 (a) FISCAL YEAR 2015.—

6 (1) IN GENERAL.—There are authorized to be  
7 appropriated to the Foundation \$7,520,900,000 for  
8 fiscal year 2015.

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

11 (A) \$6,099,360,000 shall be made avail-  
12 able for research and related activities;

13 (B) \$888,830,000 shall be made available  
14 for education and human resources, of which  
15 \$62,000,000 shall be for informal STEM edu-  
16 cation activities under section 327;

17 (C) \$200,760,000 shall be made available  
18 for major research equipment and facilities con-  
19 struction;

20 (D) \$312,900,000 shall be made available  
21 for agency operations and award management;

22 (E) \$4,430,000 shall be made available for  
23 the Office of the National Science Board, in-  
24 cluding salaries and compensation for members  
25 of the Board and staff appointed under section

1 4 of the National Science Foundation Act of  
2 1950 (42 U.S.C. 1863), travel and training  
3 costs for members of the Board and such staff,  
4 general and Board operating expenses, rep-  
5 resentational expenses for the Board, honorary  
6 awards made by the Board, Board reports  
7 (other than the report entitled “Science and  
8 Engineering Indicators”), and contracts; and

9 (F) \$14,630,000 shall be made available  
10 for the Office of Inspector General.

11 (b) FISCAL YEAR 2016.—

12 (1) IN GENERAL.—There are authorized to be  
13 appropriated to the Foundation \$7,885,770,000 for  
14 fiscal year 2016.

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

17 (A) \$6,404,330,000 shall be made avail-  
18 able for research and related activities;

19 (B) \$933,270,000 shall be made available  
20 for education and human resources, of which  
21 \$65,100,000 shall be for informal STEM edu-  
22 cation activities under section 327;

23 (C) \$200,000,000 shall be made available  
24 for major research equipment and facilities con-  
25 struction;

1 (D) \$328,550,000 shall be made available  
2 for agency operations and award management;

3 (E) \$4,560,000 shall be made available for  
4 the Office of the National Science Board, in-  
5 cluding salaries and compensation for members  
6 of the Board and staff appointed under section  
7 4 of the National Science Foundation Act of  
8 1950 (42 U.S.C. 1863), travel and training  
9 costs for members of the Board and such staff,  
10 general and Board operating expenses, rep-  
11 resentational expenses for the Board, honorary  
12 awards made by the Board, Board reports  
13 (other than the report entitled “Science and  
14 Engineering Indicators”), and contracts; and

15 (F) \$15,060,000 shall be made available  
16 for the Office of Inspector General.

17 (c) FISCAL YEAR 2017.—

18 (1) IN GENERAL.—There are authorized to be  
19 appropriated to the Foundation \$8,269,670,000 for  
20 fiscal year 2017.

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

23 (A) \$6,724,550,000 shall be made avail-  
24 able for research and related activities;

1 (B) \$979,930,000 shall be made available  
2 for education and human resources, of which  
3 \$68,360,000 shall be for informal STEM edu-  
4 cation activities under section 327;

5 (C) \$200,000,000 shall be made available  
6 for major research equipment and facilities con-  
7 struction;

8 (D) \$344,970,000 shall be made available  
9 for agency operations and award management;

10 (E) \$4,700,000 shall be made available for  
11 the Office of the National Science Board, in-  
12 cluding salaries and compensation for members  
13 of the Board and staff appointed under section  
14 4 of the National Science Foundation Act of  
15 1950 (42 U.S.C. 1863), travel and training  
16 costs for members of the Board and such staff,  
17 general and Board operating expenses, rep-  
18 resentational expenses for the Board, honorary  
19 awards made by the Board, Board reports  
20 (other than the report entitled “Science and  
21 Engineering Indicators”), and contracts; and

22 (F) \$15,520,000 shall be made available  
23 for the Office of Inspector General.

24 (d) FISCAL YEAR 2018.—

1           (1) IN GENERAL.—There are authorized to be  
2           appropriated to the Foundation \$8,672,740,000 for  
3           fiscal year 2018.

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

6                   (A) \$7,060,780,000 shall be made avail-  
7                   able for research and related activities;

8                   (B) \$1,028,930,000 shall be made avail-  
9                   able for education and human resources, of  
10                  which \$71,770,000 shall be for informal STEM  
11                  education activities under section 327;

12                  (C) \$200,000,000 shall be made available  
13                  for major research equipment and facilities con-  
14                  struction;

15                  (D) \$362,220,000 shall be made available  
16                  for agency operations and award management;

17                  (E) \$4,840,000 shall be made available for  
18                  the Office of the National Science Board, in-  
19                  cluding salaries and compensation for members  
20                  of the Board and staff appointed under section  
21                  4 of the National Science Foundation Act of  
22                  1950 (42 U.S.C. 1863), travel and training  
23                  costs for members of the Board and such staff,  
24                  general and Board operating expenses, rep-  
25                  resentational expenses for the Board, honorary

1           awards made by the Board, Board reports  
2           (other than the report entitled “Science and  
3           Engineering Indicators”), and contracts; and

4           (F) \$15,980,000 shall be made available  
5           for the Office of Inspector General.

6       (e) FISCAL YEAR 2019.—

7           (1) IN GENERAL.—There are authorized to be  
8           appropriated to the Foundation \$9,095,970,000 for  
9           fiscal year 2019.

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

12           (A) \$7,413,810,000 shall be made avail-  
13           able for research and related activities;

14           (B) \$1,080,370,000 shall be made avail-  
15           able for education and human resources, of  
16           which \$75,360,000 shall be for informal STEM  
17           education activities under section 327;

18           (C) \$200,000,000 shall be made available  
19           for major research equipment and facilities con-  
20           struction;

21           (D) \$380,330,000 shall be made available  
22           for agency operations and award management;

23           (E) \$4,980,000 shall be made available for  
24           the Office of the National Science Board, in-  
25           cluding salaries and compensation for members

1 of the Board and staff appointed under section  
2 4 of the National Science Foundation Act of  
3 1950 (42 U.S.C. 1863), travel and training  
4 costs for members of the Board and such staff,  
5 general and Board operating expenses, rep-  
6 resentational expenses for the Board, honorary  
7 awards made by the Board, Board reports  
8 (other than the report entitled “Science and  
9 Engineering Indicators”), and contracts; and  
10 (F) \$16,460,000 shall be made available  
11 for the Office of Inspector General.

12 **SEC. 302. SENSE OF CONGRESS ON SUPPORT FOR ALL**  
13 **FIELDS OF SCIENCE AND ENGINEERING.**

14 It is the sense of Congress that in order to achieve  
15 its mission “to promote the progress of science; to advance  
16 the national health, prosperity, and welfare; to secure the  
17 national defense . . .” the National Science Foundation  
18 must continue to support unfettered, competitive, merit-  
19 reviewed basic research across all fields of science and en-  
20 gineering, including the social and behavioral sciences. It  
21 is further the sense of Congress that the Foundation’s  
22 process for selecting proposals for funding, which includes  
23 merit review based on both intellectual merit and broader  
24 impacts, remains the gold standard for the world, and that

1 program officers and division directors at the Foundation  
2 play an essential role in this process.

3 **SEC. 303. MANAGEMENT AND OVERSIGHT OF LARGE FA-**  
4 **CILITIES.**

5 (a) LARGE FACILITIES OFFICE.—The Director shall  
6 maintain a Large Facilities Office within the Foundation.  
7 The functions of the Large Facilities Office shall be to  
8 support the research directorates in the development and  
9 implementation of major research facilities, including by—

10 (1) serving as the Foundation’s primary re-  
11 source for all policy or process issues related to the  
12 development and implementation of major research  
13 facilities;

14 (2) serving as a Foundation-wide resource on  
15 project management, including providing expert as-  
16 sistance on nonscientific and nontechnical aspects of  
17 project planning, budgeting, implementation, man-  
18 agement, and oversight; and

19 (3) coordinating and collaborating with research  
20 directorates to share best management practices and  
21 lessons learned from prior projects.

22 (b) OVERSIGHT OF LARGE FACILITIES.—The Direc-  
23 tor shall appoint a senior agency official within the Office  
24 of the Director whose primary responsibility is oversight



1 of major research facilities. The duties of this official shall  
2 include—

3 (1) oversight of the development, construction,  
4 and operation of major research facilities across the  
5 Foundation;

6 (2) in collaboration with the directors of the re-  
7 search directorates and other senior agency officials  
8 as appropriate, ensuring that the requirements of  
9 section 14(a) of the National Science Foundation  
10 Authorization Act of 2002 are satisfied;

11 (3) serving as a liaison to the National Science  
12 Board for approval and oversight of major research  
13 facilities; and

14 (4) periodically reviewing and updating as nec-  
15 essary Foundation policies and guidelines for the de-  
16 velopment and construction of major research facili-  
17 ties.

18 (c) POLICIES FOR COSTING LARGE FACILITIES.—

19 (1) IN GENERAL.—The Director shall ensure  
20 that the Foundation’s policies for developing and  
21 managing major research facility construction costs  
22 are consistent with the best practices described in  
23 the March 2009 General Accountability Office Re-  
24 port GAO–09–3SP.

1           (2) REPORT.—Not later than 12 months after  
2       the date of enactment of this Act, the Director shall  
3       submit to Congress a report describing the Founda-  
4       tion’s policies for developing and managing major re-  
5       search facility construction costs, including a de-  
6       scription of any aspects of the policies that diverge  
7       from the best practices recommended in General Ac-  
8       countability Office Report GAO–09–3SP.

9   **SEC. 304. DATA MANAGEMENT PLANS.**

10       (a) DEVELOPMENT OF DATA MANAGEMENT POLI-  
11   cies.—Not later than 6 months after the date of enact-  
12   ment of this Act, the Director shall develop and implement  
13   a policy requiring that all proposals for research funding  
14   from the Foundation include a plan for long-term manage-  
15   ment of data resulting from such funding.

16       (b) REQUIREMENTS.—The policy shall—

17           (1) include a clear definition of what constitutes  
18       data for the purposes of data management plans;

19           (2) include mechanisms to ensure appropriate  
20       evaluation of the merits of submitted data manage-  
21       ment plans required under this section;

22           (3) include mechanisms to ensure that research-  
23       ers comply with approved data management plans;  
24       and

1           (4) allow for the inclusion of appropriate costs  
2       for data management in proposals for research  
3       grants.

4       (c) PUBLIC DATABASES.—The Foundation shall pro-  
5       mote the deposit of data covered under this section in pub-  
6       licly accessible databases, where appropriate and available.

7       **SEC. 305. SUPPORT FOR POTENTIALLY TRANSFORMATIVE**  
8                               **RESEARCH.**

9       (a) IN GENERAL.—The Director shall establish and  
10      periodically update grant solicitation, merit review, and  
11      funding policies and mechanisms designed to identify and  
12      provide support for high-risk, high-reward basic research  
13      proposals.

14      (b) POLICIES AND MECHANISMS.—Such policies and  
15      mechanisms may include—

16           (1) development of solicitations specifically for  
17      high-risk, high-reward basic research;

18           (2) establishment of review panels for the pri-  
19      mary purpose of selecting high-risk, high-reward  
20      proposals;

21           (3) development of guidance to standard review  
22      panels to encourage the identification and consider-  
23      ation of high-risk, high-reward proposals; and

24           (4) support for workshops and other con-  
25      ferences with the primary purpose of identifying new

1 opportunities for high-risk, high-reward basic re-  
2 search, especially at interdisciplinary interfaces.

3 (c) DEFINITION.—For purposes of this section, the  
4 term “high-risk, high-reward basic research” means re-  
5 search driven by ideas that have the potential to radically  
6 change our understanding of an important existing sci-  
7 entific or engineering concept, or leading to the creation  
8 of a new paradigm or field of science or engineering, and  
9 that is characterized by its challenge to current under-  
10 standing or its pathway to new frontiers.

11 **SEC. 306. STRENGTHENING INSTITUTIONAL RESEARCH**  
12 **PARTNERSHIPS.**

13 (a) IN GENERAL.—For any Foundation research  
14 grant, in an amount greater than \$5,000,000, to be car-  
15 ried out through a partnership that includes one or more  
16 minority-serving institutions or predominantly under-  
17 graduate institutions and one or more institutions de-  
18 scribed in subsection (b), the Director shall award funds  
19 directly, according to the budget justification described in  
20 the grant proposal, to at least two of the institutions of  
21 higher education in the partnership, including at least one  
22 minority-serving institution or one predominantly under-  
23 graduate institution, to ensure a strong and equitable  
24 partnership.

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

6 (c) REPORT.—Not later than 2 years after the date  
7 of enactment of this Act, the Director shall provide a re-  
8 port to Congress on institutional research partnerships  
9 identified in subsection (a) funded in the 2 previous fiscal  
10 years and make any recommendations for how such part-  
11 nerships can continue to be strengthened.

12 **SEC. 307. INNOVATION CORPS.**

13 (a) SENSE OF CONGRESS.—It is the sense of Con-  
14 gress that—

15 (1) the National Science Foundation’s Innova-  
16 tion Corps (I-Corps) was established to foster a na-  
17 tional innovation ecosystem by encouraging institu-  
18 tions, scientists, engineers, and entrepreneurs to  
19 identify and explore the innovation and commercial  
20 potential of Foundation-funded research well beyond  
21 the laboratory;

22 (2) the Foundation’s I-Corps includes invest-  
23 ments in entrepreneurship and commercialization  
24 education, training, and mentoring, ultimately lead-  
25 ing to the practical deployment of technologies,

1 products, processes, and services that improve the  
2 Nation's competitiveness, promote economic growth,  
3 and benefit society; and

4 (3) by building networks of entrepreneurs, edu-  
5 cators, mentors, institutions, and collaborations, and  
6 supporting specialized education and training, I-  
7 Corps is at the leading edge of a strong, lasting  
8 foundation for an American innovation ecosystem.

9 (b) PROGRAM.—

10 (1) IN GENERAL.—The Director shall carry out  
11 a program to award grants for entrepreneurship and  
12 commercialization education to Foundation-funded  
13 researchers to increase the economic and social im-  
14 pact of federally funded research.

15 (2) PURPOSES.—The purpose of the program  
16 shall be to increase the capacity of STEM research-  
17 ers and students to successfully engage in entrepre-  
18 neurial activities and to help transition the results of  
19 federally funded research into the marketplace by—

20 (A) identifying STEM research that can  
21 lead to the practical deployment of technologies,  
22 products, processes, and services that improve  
23 the Nation's economic competitiveness;

24 (B) bringing STEM researchers and stu-  
25 dents together with entrepreneurs, venture cap-

1           italists, and other industry representatives expe-  
2           rienced in commercialization of new tech-  
3           nologies;

4           (C) supporting entrepreneurship and com-  
5           mercialization education and training for fac-  
6           ulty, students, postdoctoral fellows, and other  
7           STEM researchers; and

8           (D) promoting the development of regional  
9           and national networks of entrepreneurs, venture  
10          capitalists, and other industry representatives  
11          who can serve as mentors to researchers and  
12          students at Foundation-funded institutions  
13          across the country.

14          (3) ADDITIONAL USE OF FUNDS.—Grants  
15          awarded under this subsection may be used to help  
16          support—

17               (A) prototype and proof-of-concept devel-  
18               opment for the funded project; and

19               (B) additional activities needed to build a  
20               national infrastructure for STEM entrepreneur-  
21               ship.

22          (4) OTHER FEDERAL AGENCIES.—The Director  
23          may establish agreements with other Federal agen-  
24          cies that fund scientific research to make research-

1       ers funded by those agencies eligible to participate  
 2       in the Foundation’s Innovation Corps program.

3   **SEC. 308. DEFINITIONS.**

4       For purposes of this title:

5           (1) DIRECTOR.—The term “Director” means  
 6       the Director of the Foundation.

7           (2) FOUNDATION.—The term “Foundation”  
 8       means the National Science Foundation.

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

13          (4) STEM.—The term “STEM” means science,  
 14       technology, engineering, and mathematics, including  
 15       computer science.

16       **Subtitle B—STEM Education**

17   **SEC. 321. NATIONAL SCIENCE BOARD REPORT ON CONSOLI-**  
 18                   **DATION OF STEM EDUCATION ACTIVITIES AT**  
 19                   **THE FOUNDATION.**

20       (a) IN GENERAL.—The National Science Board shall  
 21       review and evaluate the appropriateness of the Founda-  
 22       tion’s portfolio of STEM education programs and activi-  
 23       ties at the pre-K–12 and undergraduate levels, including  
 24       informal education, taking into account the mission of the



1 Foundation and the 2013 Federal STEM Education 5-  
2 Year Strategic Plan.

3 (b) REPORT.—Not later than 1 year after the date  
4 of enactment of this Act, the National Science Board shall  
5 submit to Congress a report summarizing their findings  
6 and including—

7 (1) an analysis of how well the Foundation’s  
8 portfolio of STEM education programs is contrib-  
9 uting to the mission of the Foundation;

10 (2) an analysis of how well STEM education  
11 programs and activities are coordinated and best  
12 practices are shared across the Foundation;

13 (3) an analysis of how well the Foundation’s  
14 portfolio of STEM education programs is aligned  
15 with and contributes to priority STEM education in-  
16 vestment areas described in the 2013 Federal STEM  
17 Education 5-Year Strategic Plan;

18 (4) any Board recommendations regarding in-  
19 ternal reorganization, including consolidation, of the  
20 Foundation’s STEM education programs and activi-  
21 ties, taking into account both the mission of the  
22 Foundation and the 2013 Federal STEM Education  
23 5-Year Strategic Plan;

24 (5) any Board recommendations regarding the  
25 Foundation’s role in helping to implement the Fed-

1        eral STEM Education 5-Year Strategic Plan, includ-  
2        ing opportunities for the Foundation to more effec-  
3        tively partner and collaborate with other Federal  
4        agencies; and

5            (6) any additional Board recommendations re-  
6        garding specific management, policy, budget, or  
7        other steps the Foundation should take to increase  
8        effectiveness and accountability across its portfolio  
9        of STEM education programs and activities.

10    **SEC. 322. MODELS FOR GRADUATE STUDENT SUPPORT.**

11        (a) IN GENERAL.—The Director shall enter into an  
12        agreement with the National Research Council to convene  
13        a workshop or roundtable to examine models of Federal  
14        support for STEM graduate students, including the Foun-  
15        dation’s Graduate Research Fellowship program and com-  
16        parable fellowship programs at other agencies, traineeship  
17        programs, and the research assistant model.

18        (b) PURPOSE.—The purpose of the workshop or  
19        roundtable shall be to compare and evaluate the extent  
20        to which each of these models helps to prepare graduate  
21        students for diverse careers utilizing STEM degrees, in-  
22        cluding at diverse types of institutions of higher education,  
23        in industry, and at government agencies and research lab-  
24        oratories, and to make recommendations regarding—

1           (1) how current Federal programs and models,  
2           including programs and models at the Foundation,  
3           can be improved;

4           (2) the appropriateness of the current distribu-  
5           tion of funding among the different models at the  
6           Foundation and across the agencies; and

7           (3) the appropriateness of creating a new edu-  
8           cation and training program for graduate students  
9           distinct from programs that provide direct financial  
10          support, including the grants authorized in section  
11          527 of the America COMPETES Reauthorization  
12          Act of 2010 (42 U.S.C. 1862p–15).

13       (c) CRITERIA.—At a minimum, in comparing pro-  
14       grams and models, the workshop or roundtable partici-  
15       pants shall consider the capacity of such programs or  
16       models to provide students with knowledge and skills—

17           (1) to become independent, creative, successful  
18       researchers;

19           (2) to participate in large interdisciplinary re-  
20       search projects, including in an international con-  
21       text;

22           (3) to adhere to the highest standards for re-  
23       search ethics;

24           (4) to become high-quality teachers utilizing the  
25       most currently available evidence-based pedagogy;

1           (5) in oral and written communication, to both  
2           technical and nontechnical audiences;

3           (6) in innovation, entrepreneurship, and busi-  
4           ness ethics; and

5           (7) in program management.

6           (d) GRADUATE STUDENT INPUT.—The participants  
7           in the workshop or roundtable shall include current or re-  
8           cent STEM graduate students.

9           (e) REPORT.—Not later than 1 year after the date  
10          of enactment of this Act, the National Research Council  
11          shall submit to Congress a summary report of the findings  
12          and recommendations of the workshop or roundtable con-  
13          vened under this section.

14       **SEC. 323. UNDERGRADUATE STEM EDUCATION REFORM.**

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

18       **“SEC. 17. UNDERGRADUATE STEM EDUCATION REFORM.**

19          “(a) IN GENERAL.—The Director, through the Direc-  
20          torate for Education and Human Resources, shall award  
21          grants, on a competitive, merit-reviewed basis, to institu-  
22          tions of higher education (or to consortia thereof) and to  
23          other eligible nonprofit organizations to reform under-  
24          graduate STEM education for the purpose of increasing  
25          the number and quality of students studying toward and

1 completing baccalaureate degrees in STEM and improving  
2 the STEM learning outcomes for all undergraduate stu-  
3 dents.

4 “(b) INTERDIRECTORATE WORKING GROUP ON UN-  
5 DERGRADUATE STEM EDUCATION.—In carrying out the  
6 requirements of this section, the Directorate for Education  
7 and Human Resources shall collaborate and coordinate  
8 with the Research Directorates, including through the es-  
9 tablishment of an interdirectorate working group on un-  
10 dergraduate STEM education reform, in order to identify  
11 and implement new and expanded opportunities for col-  
12 laboration between STEM disciplinary researchers and  
13 education researchers on the reform of undergraduate  
14 STEM education.

15 “(c) GRANTS.—Research and development supported  
16 by grants under this section may encompass a single dis-  
17 cipline, multiple disciplines, or interdisciplinary education  
18 at the undergraduate level, and may include—

19 “(1) research foundational to the improvement  
20 of teaching, learning, and retention;

21 “(2) development, implementation, and assess-  
22 ment of innovative, research-based approaches to  
23 transforming teaching, learning, and retention; and

24 “(3) scaling of successful efforts on learning  
25 and learning environments, broadening participation,

1 workforce preparation, employing emerging tech-  
2 nologies, or other reforms in STEM education, in-  
3 cluding expansion of successful STEM reform ef-  
4 forts beyond a single course or group of courses to  
5 achieve reform within an entire academic unit, or ex-  
6 pansion of successful reform efforts beyond a single  
7 academic unit to other STEM academic units within  
8 an institution or to comparable academic units at  
9 other institutions.

10 “(d) SELECTION PROCESS.—

11 “(1) APPLICATIONS.—An institution of higher  
12 education or other eligible nonprofit organization  
13 seeking a grant under this section shall submit an  
14 application to the Director at such time, in such  
15 manner, and containing such information as the Di-  
16 rector may require. In addition to a description of  
17 the proposed research, development, or scaling ef-  
18 fort, including a description of the research findings  
19 that will serve as the basis for the proposed effort,  
20 applications shall include, at a minimum—

21 “(A) evidence of institutional support for,  
22 and commitment to, the proposed effort, includ-  
23 ing long-term commitment to implement and  
24 scale successful strategies resulting from the  
25 current effort;

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

6           “(C) a description of the plans for assess-  
7           ment and evaluation of the effort, including evi-  
8           dence of participation by individuals with expe-  
9           rience in assessment and evaluation of teaching  
10          and learning programs.

11          “(2) REVIEW OF APPLICATIONS.—In selecting  
12          grant recipients for funding under this section, the  
13          Director shall consider, as appropriate to the scale  
14          of the proposed effort—

15               “(A) the likelihood of success in under-  
16               taking the proposed effort at the institution  
17               submitting the application, including the extent  
18               to which the faculty, staff, and administrators  
19               of the institution are committed to making un-  
20               dergraduate STEM education reform a priority  
21               of the participating academic unit or units;

22               “(B) the degree to which the proposed ef-  
23               fort will contribute to change in institutional  
24               culture and policy such that a greater value is

1 placed on faculty engagement in undergraduate  
2 education;

3 “(C) the likelihood that the institution will  
4 sustain or expand the effort beyond the period  
5 of the grant; and

6 “(D) the degree to which the proposed ef-  
7 fort will contribute to the systematic accumula-  
8 tion of knowledge on STEM education.

9 “(3) PRIORITY.—The Director shall give pri-  
10 ority to proposals focused on the first 2 years of un-  
11 dergraduate education, including STEM education  
12 at 2-year institutions of higher education.

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

17 **SEC. 324. ADVANCED MANUFACTURING EDUCATION.**

18 Section 506(b) of the America COMPETES Reau-  
19 thorization Act of 2010 (42 U.S.C. 1862p–1(b)) is amend-  
20 ed to read as follows:

21 “(b) ADVANCED MANUFACTURING EDUCATION.—  
22 The Director shall award grants, on a competitive, merit  
23 reviewed basis, to community colleges for the development  
24 and implementation of innovative advanced manufacturing  
25 education reforms to ensure an adequate and well-trained



1 advanced manufacturing workforce. Activities supported  
2 by grants under this subsection may include—

3 “(1) the development or expansion of edu-  
4 cational materials, courses, curricula, strategies, and  
5 methods that will lead to improved advanced manu-  
6 facturing degree or certification programs, including  
7 the integration of industry standards and workplace  
8 competencies into the curriculum;

9 “(2) the development and implementation of  
10 faculty professional development programs that en-  
11 hance a faculty member’s capabilities and teaching  
12 skills in advanced manufacturing, including efforts  
13 to understand current advanced manufacturing tech-  
14 nologies and practices;

15 “(3) the establishment of centers that provide  
16 models and leadership in advanced manufacturing  
17 education and serve as regional or national clearing-  
18 houses for educational materials and methods, in-  
19 cluding in rural areas;

20 “(4) activities to enhance the recruitment and  
21 retention of students into certification and degree  
22 programs in advanced manufacturing, including the  
23 provision of improved mentoring and internship op-  
24 portunities;

1           “(5) the establishment of partnerships with pri-  
 2       vate sector entities to ensure the development of an  
 3       advanced manufacturing workforce with the skills  
 4       necessary to meet regional economic needs; and  
 5           “(6) other activities as determined appropriate  
 6       by the Director.”.

7   **SEC. 325. STEM EDUCATION PARTNERSHIPS.**

8       Section 9 of the National Science Foundation Au-  
 9       thorization Act of 2002 (42 U.S.C. 1862n) is amended—  
 10           (1) in the section heading, by striking “**MATH-**  
 11       **EMATICS AND SCIENCE**” and inserting “**STEM**”;  
 12           (2) by striking “mathematics and science” each  
 13       place it appears in subsections (a) and (b) and in-  
 14       serting “STEM”;  
 15           (3) by striking “mathematics or science” each  
 16       place it appears in subsection (a)(3) and (4)(A) and  
 17       inserting “STEM”;  
 18           (4) by striking “mathematics, science, or engi-  
 19       neering” in subsection (a)(2)(B) and inserting  
 20       “STEM”;  
 21           (5) by striking “mathematics, science, and tech-  
 22       nology” in subsection (a)(3)(B)(ii)(II) and (8) and  
 23       inserting “STEM”;

1           (6) by striking “professional mathematicians,  
2           scientists, and engineers” in subsection (a)(3)(F)  
3           and inserting “STEM professionals”;

4           (7) by striking “mathematicians, scientists, and  
5           engineers” in subsection (a)(3)(J) and (M) and in-  
6           serting “STEM professionals”;

7           (8) by striking “scientists, technologists, engi-  
8           neers, or mathematicians” in subsection (a)(8) and  
9           inserting “STEM professionals”;

10          (9) by striking “science, technology, engineer-  
11          ing, and mathematics” each place it appears in sub-  
12          section (a)(3)(K) and (10) and inserting “STEM”;

13          (10) by striking “science, technology, engineer-  
14          ing, or mathematics” in subsection (a)(10)(A)(ii)(II)  
15          and inserting “STEM”;

16          (11) by striking “science, mathematics, engi-  
17          neering, and technology” each place it appears in  
18          subsection (a)(5) and inserting “STEM”;

19          (12) by striking “science, mathematics, engi-  
20          neering, or technology” in subsection (a)(5) and in-  
21          serting “STEM”;

22          (13) by striking “mathematics, science, engi-  
23          neering, and technology” in subsection (b)(1) and  
24          (2) and inserting “STEM”; and

25          (14) by striking subsection (d).

1 **SEC. 326. NOYCE SCHOLARSHIP PROGRAM AMENDMENTS.**

2 Section 10A of the National Science Foundation Au-  
3 thorization Act of 2002 (42 U.S.C. 1862n–1a) is amend-  
4 ed—

5 (1) in subsection (a)(2)(B), by inserting “or  
6 bachelor’s” after “master’s”;

7 (2) in subsection (c)—

8 (A) by striking “and” at the end of para-  
9 graph (2)(B);

10 (B) in paragraph (3), by—

11 (i) inserting “for teachers with mas-  
12 ter’s degrees in their field” after “Teach-  
13 ing Fellowships”; and

14 (ii) by striking the period at the end  
15 of subparagraph (B) and inserting “;  
16 and”; and

17 (C) by adding at the end the following new  
18 paragraph:

19 “(4) in the case of National Science Foundation  
20 Master Teaching Fellowships for teachers with bach-  
21 elor’s degrees in their field—

22 “(A) offering academic courses leading to  
23 a master’s degree and leadership training to  
24 prepare individuals to become master teachers  
25 in elementary and secondary schools; and

1           “(B) offering programs both during and  
2           after matriculation in the program for which  
3           the fellowship is received to enable fellows to  
4           become highly effective mathematics and  
5           science teachers, including mentoring, training,  
6           induction, and professional development activi-  
7           ties, to fulfill the service requirements of this  
8           section, including the requirements of sub-  
9           section (e), and to exchange ideas with others  
10          in their fields.”;

11          (3) in subsection (e), by striking “subsection  
12          (g)” and inserting “subsection (h)”; and

13          (4) by adding after subsection (f) the following  
14          new subsection:

15          “(g) SUPPORT FOR MASTER TEACHING FELLOWS  
16          WHILE ENROLLED IN A MASTER’S DEGREE PROGRAM.—  
17          A National Science Foundation Master Teacher Fellow  
18          may receive a maximum of 1 year of fellowship support  
19          while enrolled in a master’s degree program as described  
20          in subsection (c)(4)(A), except that if such fellow is en-  
21          rolled in a part-time program, such amount shall be pro-  
22          rated according to the length of the program.”.

1 **SEC. 327. INFORMAL STEM EDUCATION.**

2 (a) GRANTS.—The Director, through the Directorate  
3 for Education and Human Resources, shall continue to  
4 award competitive, merit-reviewed grants to support—

5 (1) research and development of innovative out-  
6 of-school STEM learning and emerging STEM  
7 learning environments in order to improve STEM  
8 learning outcomes and engagement in STEM; and

9 (2) research that advances the field of informal  
10 STEM education.

11 (b) USES OF FUNDS.—Activities supported by grants  
12 under this section may encompass a single STEM dis-  
13 cipline, multiple STEM disciplines, or integrative STEM  
14 initiatives and shall include—

15 (1) research and development that improves our  
16 understanding of learning and engagement in infor-  
17 mal environments, including the role of informal en-  
18 vironments in broadening participation in STEM;  
19 and

20 (2) design and testing of innovative STEM  
21 learning models, programs, and other resources for  
22 informal learning environments to improve STEM  
23 learning outcomes and increase engagement for K–  
24 12 students, K–12 teachers, and the general public,  
25 including design and testing of the scalability of  
26 models, programs, and other resources.

1 **SEC. 328. RESEARCH AND DEVELOPMENT TO SUPPORT IM-**  
2 **PROVED K-12 LEARNING.**

3 (a) IN GENERAL.—The Director, acting through the  
4 Directorate for Education and Human Resources, shall  
5 award competitive, merit-reviewed grants to support re-  
6 search and development on alignment, implementation,  
7 impact, and ongoing improvement of standards and equiv-  
8 alent learning expectations used by States in mathematics,  
9 science, and, as appropriate, other State-based STEM  
10 standards.

11 (b) RESEARCH AREAS.—In making awards under  
12 this section, the Director shall consider proposals for re-  
13 search and development, including, as appropriate, large-  
14 scale research and development, of—

15 (1) resources, including virtual resources such  
16 as web portals, for content, professional develop-  
17 ment, and research results;

18 (2) teacher education and professional develop-  
19 ment;

20 (3) learning progressions;

21 (4) assessments;

22 (5) metrics for evaluating the impact of stand-  
23 ards; and

24 (6) other areas of research and development  
25 that are likely to contribute to the alignment, imple-

1       mentation, impact, and ongoing improvement of  
2       standards in STEM subjects.

3       **TITLE IV—NATIONAL INSTITUTE**  
4       **OF STANDARDS AND TECH-**  
5       **NOLOGY**

6       **SEC. 401. SHORT TITLE.**

7       This title may be cited as the “National Institute of  
8       Standards and Technology Authorization Act of 2014”.

9       **SEC. 402. AUTHORIZATION OF APPROPRIATIONS.**

10       (a) FISCAL YEAR 2015.—

11               (1) IN GENERAL.—There are authorized to be  
12       appropriated to the Secretary of Commerce  
13       \$892,500,000 for the National Institute of Stand-  
14       ards and Technology for fiscal year 2015.

15               (2) SPECIFIC ALLOCATIONS.—Of the amount  
16       authorized by paragraph (1)—

17                       (A) \$683,550,000 shall be authorized for  
18       scientific and technical research and services  
19       laboratory activities;

20                       (B) \$58,800,000 shall be authorized for  
21       the construction and maintenance of facilities;  
22       and

23                       (C) \$150,150,000 shall be authorized for  
24       industrial technology services activities, of  
25       which—



1 (i) \$134,400,000 shall be authorized  
2 for the Hollings Manufacturing Extension  
3 Partnership under section 25 of the Na-  
4 tional Institute of Standards and Tech-  
5 nology Act (15 U.S.C. 278k) and the pro-  
6 gram under section 26 of such Act (15  
7 U.S.C. 278l), of which not more than  
8 \$20,000,000 shall be for the competitive  
9 grant program under section 25(f) of such  
10 Act; and

11 (ii) \$15,750,000 shall be authorized  
12 for the Advanced Manufacturing Tech-  
13 nology Consortia program established  
14 under section 33 of such Act (15 U.S.C.  
15 278r).

16 (b) FISCAL YEAR 2016.—

17 (1) IN GENERAL.—There are authorized to be  
18 appropriated to the Secretary of Commerce  
19 \$937,130,000 for the National Institute of Stand-  
20 ards and Technology for fiscal year 2016.

21 (2) SPECIFIC ALLOCATIONS.—Of the amount  
22 authorized by paragraph (1)—

23 (A) \$717,730,000 shall be authorized for  
24 scientific and technical research and services  
25 laboratory activities;

1 (B) \$61,740,000 shall be authorized for  
2 the construction and maintenance of facilities;  
3 and

4 (C) \$157,660,000 shall be authorized for  
5 industrial technology services activities, of  
6 which—

7 (i) \$141,120,000 shall be authorized  
8 for the Hollings Manufacturing Extension  
9 Partnership under section 25 of the Na-  
10 tional Institute of Standards and Tech-  
11 nology Act (15 U.S.C. 278k) and the pro-  
12 gram under section 26 of such Act (15  
13 U.S.C. 278l), of which not more than  
14 \$20,000,000 shall be for the competitive  
15 grant program under section 25(f) of such  
16 Act; and

17 (ii) \$16,540,000 shall be authorized  
18 for the Advanced Manufacturing Tech-  
19 nology Consortia program established  
20 under section 33 of such Act (15 U.S.C.  
21 278r).

22 (c) FISCAL YEAR 2017.—

23 (1) IN GENERAL.—There are authorized to be  
24 appropriated to the Secretary of Commerce

1       \$983,980,000 for the National Institute of Stand-  
2       ards and Technology for fiscal year 2017.

3           (2) SPECIFIC ALLOCATIONS.—Of the amount  
4       authorized by paragraph (1)—

5           (A) \$753,610,000 shall be authorized for  
6       scientific and technical research and services  
7       laboratory activities;

8           (B) \$64,830,000 shall be authorized for  
9       the construction and maintenance of facilities;  
10      and

11          (C) \$165,540,000 shall be authorized for  
12      industrial technology services activities, of  
13      which—

14           (i) \$148,180,000 shall be authorized  
15      for the Hollings Manufacturing Extension  
16      Partnership under section 25 of the Na-  
17      tional Institute of Standards and Tech-  
18      nology Act (15 U.S.C. 278k) and the pro-  
19      gram under section 26 of such Act (15  
20      U.S.C. 278l), of which not more than  
21      \$20,000,000 shall be for the competitive  
22      grant program under section 25(f) of such  
23      Act; and

24           (ii) \$17,360,000 shall be authorized  
25      for the Advanced Manufacturing Tech-

1           nology Consortia program established  
2           under section 33 of such Act (15 U.S.C.  
3           278r).

4       (d) FISCAL YEAR 2018.—

5           (1) IN GENERAL.—There are authorized to be  
6       appropriated to the Secretary of Commerce  
7       \$1,033,180,000 for the National Institute of Stand-  
8       ards and Technology for fiscal year 2018.

9           (2) SPECIFIC ALLOCATIONS.—Of the amount  
10      authorized by paragraph (1)—

11           (A) \$791,290,000 shall be authorized for  
12      scientific and technical research and services  
13      laboratory activities;

14           (B) \$68,070,000 shall be authorized for  
15      the construction and maintenance of facilities;  
16      and

17           (C) \$173,820,000 shall be authorized for  
18      industrial technology services activities, of  
19      which—

20           (i) \$155,580,000 shall be authorized  
21      for the Hollings Manufacturing Extension  
22      Partnership under section 25 of the Na-  
23      tional Institute of Standards and Tech-  
24      nology Act (15 U.S.C. 278k) and the pro-  
25      gram under section 26 of such Act (15

U.S.C. 278l), of which not more than \$20,000,000 shall be for the competitive grant program under section 25(f) of such Act; and

(ii) \$18,230,000 shall be authorized for the Advanced Manufacturing Technology Consortia program established under section 33 of such Act (15 U.S.C. 278r).

(e) FISCAL YEAR 2019.—

(1) IN GENERAL.—There are authorized to be appropriated to the Secretary of Commerce \$1,084,840,000 for the National Institute of Standards and Technology for fiscal year 2019.

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

(A) \$830,860,000 shall be authorized for scientific and technical research and services laboratory activities;

(B) \$71,470,000 shall be authorized for the construction and maintenance of facilities; and

(C) \$182,510,000 shall be authorized for industrial technology services activities, of which—

(i) \$163,360,000 shall be authorized for the Hollings Manufacturing Extension Partnership under section 25 of the National Institute of Standards and Technology Act (15 U.S.C. 278k) and the program under section 26 of such Act (15 U.S.C. 278l), of which not more than \$20,000,000 shall be for the competitive grant program under section 25(f) of such Act; and

(ii) \$19,140,000 shall be authorized for the Advanced Manufacturing Technology Consortia program established under section 33 of such Act (15 U.S.C. 278r).

**SEC. 403. ADVANCED MANUFACTURING TECHNOLOGY CONSORTIA.**

Section 33 of the National Institute of Standards and Technology Act (15 U.S.C. 278r) is amended to read as follows:

**“SEC. 33. ADVANCED MANUFACTURING TECHNOLOGY CONSORTIA.**

**“(a) AUTHORITY.—**

**“(1) IN GENERAL.—**The Director shall carry out a program to facilitate the development of and

1 provide support to industry-led consortia that will  
2 identify, prioritize, and address long-term,  
3 precompetitive industrial research needs in the area  
4 of advanced manufacturing.

5 “(2) PROGRAM OBJECTIVES.—The objectives of  
6 the program established under this section include  
7 the following:

8 “(A) To promote collective public-private  
9 efforts to develop key technology platforms and  
10 infrastructure for advanced manufacturing.

11 “(B) To enable the prioritization of public  
12 research portfolios to be more responsive to the  
13 long-term technology development needs of in-  
14 dustry.

15 “(C) To leverage Federal investment in ad-  
16 vanced manufacturing with shared investment  
17 by the private sector.

18 “(D) To increase industrial research and  
19 development investment in precompetitive tech-  
20 nology platforms and infrastructure.

21 “(E) To accelerate technological innovation  
22 in advanced manufacturing.

23 “(F) To foster broad participation by in-  
24 dustry, the Federal Government, institutions of  
25 higher education, and State, local, and tribal

1 governments in advanced manufacturing re-  
2 search and development.

3 “(b) ACTIVITIES.—As part of the program estab-  
4 lished under this section, the Director shall—

5 “(1) support the formation of industry-led con-  
6 sortia composed of representatives from industry (in-  
7 cluding small and medium-sized manufacturers), in-  
8 stitutions of higher education, the Federal Govern-  
9 ment, State, local, and tribal governments, and other  
10 entities, as appropriate;

11 “(2) collaborate with consortia participants in  
12 the development of technology roadmaps that iden-  
13 tify research needs in the area of advanced manufac-  
14 turing;

15 “(3) support precompetitive research directed at  
16 meeting the research needs identified in the road-  
17 maps developed under paragraph (2);

18 “(4) promote the transfer of precompetitive  
19 technology platforms and infrastructure resulting  
20 from consortia research to the private sector and fa-  
21 cilitate open access to the intellectual property un-  
22 derpinning those platforms and technology; and

23 “(5) facilitate the development of new tech-  
24 nologies into commercial products.



1       “(c) **SELECTION CRITERIA.**—In selecting applica-  
 2 tions for awards under this section, the Director shall con-  
 3 sider, at a minimum—

4               “(1) the degree to which the activities proposed  
 5 under the consortia will broadly impact manufac-  
 6 turing, including regional manufacturing efforts, and  
 7 increase the productivity and economic competitive-  
 8 ness of the United States;

9               “(2) the level of technical risk to be addressed  
 10 by the consortia;

11               “(3) the potential to produce fundamental new  
 12 knowledge; and

13               “(4) the likelihood that the consortia will be-  
 14 come self-sustaining, if appropriate.”.

15 **SEC. 404. NETWORK FOR MANUFACTURING INNOVATION.**

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

18               (1) by redesignating section 34 as section 36;

19       and

20               (2) by inserting after section 33 (15 U.S.C.  
 21 278r) the following:

22 **“SEC. 34. NETWORK FOR MANUFACTURING INNOVATION.**

23       “(a) **ESTABLISHMENT OF NETWORK FOR MANUFAC-**  
 24 **TURING INNOVATION PROGRAM.**—

1           “(1) IN GENERAL.—The Secretary shall estab-  
2       lish within the Institute a program to be known as  
3       the ‘Network for Manufacturing Innovation Pro-  
4       gram’ (referred to in this section as the ‘Program’).

5           “(2) PURPOSES OF PROGRAM.—The purposes of  
6       the Program are—

7           “(A) to improve the competitiveness of  
8       United States manufacturing and to increase  
9       domestic production;

10          “(B) to stimulate United States leadership  
11       in advanced manufacturing research, innova-  
12       tion, and technology;

13          “(C) to facilitate the transition of innova-  
14       tive technologies into scalable, cost-effective,  
15       and high-performing manufacturing capabili-  
16       ties;

17          “(D) to facilitate access by manufacturing  
18       enterprises to capital-intensive infrastructure,  
19       including high-performance computing, in order  
20       to improve the speed with which such enter-  
21       prises commercialize new processes and tech-  
22       nologies;

23          “(E) to accelerate the development of an  
24       advanced manufacturing workforce;

1           “(F) to facilitate peer exchange of and the  
2           documentation of best practices in addressing  
3           advanced manufacturing challenges; and

4           “(G) to leverage non-Federal sources of  
5           support to promote a stable and sustainable  
6           business model without the need for long-term  
7           Federal funding.

8           “(3) SUPPORT.—The Secretary, acting through  
9           the Director, shall carry out the purposes set forth  
10          in paragraph (2) by supporting—

11           “(A) the Network for Manufacturing Inno-  
12          vation established under subsection (b); and

13           “(B) the establishment of centers for man-  
14          ufacturing innovation.

15          “(4) DIRECTOR.—The Secretary shall carry out  
16          the Program through the Director.

17          “(b) ESTABLISHMENT OF NETWORK FOR MANUFAC-  
18          TURING INNOVATION.—

19           “(1) IN GENERAL.—As part of the Program,  
20          the Secretary shall establish a network of centers for  
21          manufacturing innovation.

22           “(2) DESIGNATION.—The network established  
23          under paragraph (1) shall be known as the ‘Network  
24          for Manufacturing Innovation’ (referred to in this  
25          section as the ‘Network’).

1 “(c) CENTERS FOR MANUFACTURING INNOVATION.—

2 “(1) IN GENERAL.—For purposes of this sec-  
3 tion, a ‘center for manufacturing innovation’ is a  
4 center that—

5 “(A) has been established by a person to  
6 address challenges in advanced manufacturing  
7 and to assist manufacturers in retaining or ex-  
8 panding industrial production and jobs in the  
9 United States;

10 “(B) has a predominant focus on a manu-  
11 facturing process, novel material, enabling tech-  
12 nology, supply chain integration methodology,  
13 or another relevant aspect of advanced manu-  
14 facturing, as determined by the Secretary, with  
15 the potential—

16 “(i) to improve the competitiveness of  
17 United States manufacturing;

18 “(ii) to accelerate investment in ad-  
19 vanced manufacturing production capacity  
20 in the United States; and

21 “(iii) to enable the commercial appli-  
22 cation of new technologies or industry-wide  
23 manufacturing processes; and

24 “(C) includes active participation among  
25 representatives from multiple industrial entities,

1 research universities, community colleges, and  
2 such other entities as the Secretary considers  
3 appropriate, which may include career and tech-  
4 nical education schools, Federal laboratories,  
5 State, local, and tribal governments, businesses,  
6 educational institutions, and nonprofit organiza-  
7 tions.

8 “(2) ACTIVITIES.—Activities of a center for  
9 manufacturing innovation may include the following:

10 “(A) Research, development, and dem-  
11 onstration projects, including proof-of-concept  
12 development and prototyping, to reduce the  
13 cost, time, and risk of commercializing new  
14 technologies and improvements in existing tech-  
15 nologies, processes, products, and research and  
16 development of materials to solve pre-competi-  
17 tive industrial problems with economic or na-  
18 tional security implications.

19 “(B) Development and implementation of  
20 education and training courses, materials, and  
21 programs.

22 “(C) Development of innovative methodolo-  
23 gies and practices for supply chain integration  
24 and introduction of new technologies into sup-  
25 ply chains.

1           “(D) Outreach and engagement with small  
2           and medium-sized manufacturing enterprises, in  
3           addition to large manufacturing enterprises.

4           “(E) Such other activities as the Sec-  
5           retary, in consultation with Federal depart-  
6           ments and agencies whose missions contribute  
7           to or are affected by advanced manufacturing,  
8           considers consistent with the purposes described  
9           in subsection (a)(2).

10          “(3) ADDITIONAL CENTERS FOR MANUFAC-  
11          TURING INNOVATION.—The National Additive Man-  
12          ufacturing Innovation Institute and pending manu-  
13          facturing centers under interagency review shall be  
14          considered centers for manufacturing innovation.

15          “(d) FINANCIAL ASSISTANCE TO ESTABLISH AND  
16          SUPPORT CENTERS FOR MANUFACTURING INNOVA-  
17          TION.—

18               “(1) IN GENERAL.—In carrying out the Pro-  
19               gram, the Secretary shall award financial assistance  
20               to a person to assist the person in planning, estab-  
21               lishing, or supporting a center for manufacturing in-  
22               novation.

23               “(2) APPLICATION.—A person seeking financial  
24               assistance under paragraph (1) shall submit to the  
25               Secretary an application therefor at such time, in

1 such manner, and containing such information as  
2 the Secretary may require.

3 “(3) OPEN PROCESS.—In soliciting applications  
4 for financial assistance under paragraph (1), the  
5 Secretary shall ensure an open process that will  
6 allow for the consideration of all applications rel-  
7 evant to advanced manufacturing regardless of tech-  
8 nology area.

9 “(4) SELECTION.—

10 “(A) COMPETITIVE, MERIT REVIEW.—In  
11 awarding financial assistance under paragraph  
12 (1), the Secretary shall use a competitive, merit  
13 review process.

14 “(B) COLLABORATION.—In awarding fi-  
15 nancial assistance under paragraph (1), the  
16 Secretary shall, acting through the National  
17 Program Office established under subsection  
18 (e)(1), collaborate with Federal departments  
19 and agencies whose missions contribute to or  
20 are affected by advanced manufacturing.

21 “(C) CONSIDERATIONS.—In selecting a  
22 person who submitted an application under  
23 paragraph (2) for an award of financial assist-  
24 ance under paragraph (1), the Secretary shall  
25 consider, at a minimum, the following:

1           “(i) The potential of the center for  
2           manufacturing innovation to advance do-  
3           mestic manufacturing and the likelihood of  
4           economic impact in the predominant focus  
5           areas of the center for manufacturing in-  
6           novation.

7           “(ii) The commitment of continued fi-  
8           nancial support, advice, participation, and  
9           other contributions from non-Federal  
10          sources to provide leverage and resources  
11          to promote a stable and sustainable busi-  
12          ness model without the need for long-term  
13          Federal funding.

14          “(iii) How the center for manufac-  
15          turing innovation will engage with small  
16          and medium-sized manufacturing enter-  
17          prises, to improve the capacity of such en-  
18          terprises to commercialize new processes  
19          and technologies.

20          “(iv) How the center for manufac-  
21          turing innovation will carry out educational  
22          and workforce activities that meet indus-  
23          trial needs related to the predominant  
24          focus areas of the center for manufac-  
25          turing innovation.



1                   “(v) How the center for manufac-  
2                   turing innovation will advance economic  
3                   competitiveness.

4                   “(vi) How the center for manufac-  
5                   turing innovation will strengthen and lever-  
6                   age the assets of a region.

7                   “(5) LIMITATION ON PERIOD FOR AWARDS.—  
8                   No award of financial assistance may be made under  
9                   paragraph (1) to a center of manufacturing innova-  
10                  tion after the 7-year period beginning on the date on  
11                  which the Secretary first awards financial assistance  
12                  to a center under such paragraph.

13                  “(e) NATIONAL PROGRAM OFFICE.—

14                  “(1) ESTABLISHMENT.—The Secretary shall es-  
15                  tablish or designate, within the Institute, an Ad-  
16                  vanced Manufacturing National Program Office (re-  
17                  ferred to in this section as the ‘National Program  
18                  Office’), which shall oversee and carry out the Pro-  
19                  gram.

20                  “(2) FUNCTIONS.—The functions of the Na-  
21                  tional Program Office are—

22                         “(A) to oversee the planning, management,  
23                         and coordination of the Program;

24                         “(B) to enter into memorandums of under-  
25                         standing with Federal departments and agen-

1           cies, whose missions contribute to or are af-  
2           fected by advanced manufacturing, to carry out  
3           the purposes described in subsection (a)(2);

4           “(C) to develop, not later than 1 year after  
5           the date of the enactment of the National Insti-  
6           tute of Standards and Technology Authoriza-  
7           tion Act of 2014, and update not less frequently  
8           than once every 3 years thereafter, a strategic  
9           plan to guide the Program;

10          “(D) to establish such procedures, proc-  
11          esses, and criteria as may be necessary and ap-  
12          propriate to maximize cooperation and coordi-  
13          nate of the activities of the Program with pro-  
14          grams and activities of other Federal depart-  
15          ments and agencies whose missions contribute  
16          to or are affected by advanced manufacturing;

17          “(E) to establish a clearinghouse of public  
18          information related to the activities of the Pro-  
19          gram; and

20          “(F) to act as a convener of the Network.

21          “(3) RECOMMENDATIONS.—In developing and  
22          updating the strategic plan under paragraph (2)(C),  
23          the Secretary shall solicit recommendations and ad-  
24          vice from a wide range of stakeholders, including in-  
25          dustry, small and medium-sized manufacturing en-

1       terprises, research universities, community colleges,  
2       and other relevant organizations and institutions.

3           “(4) REPORT TO CONGRESS.—The Secretary  
4       shall transmit the strategic plan required under  
5       paragraph (2)(C) to the Committee on Commerce,  
6       Science, and Transportation of the Senate and the  
7       Committee on Science, Space, and Technology of the  
8       House of Representatives.

9           “(5) HOLLINGS MANUFACTURING EXTENSION  
10       PARTNERSHIP.—The Secretary shall ensure that the  
11       National Program Office incorporates the Hollings  
12       Manufacturing Extension Partnership into Program  
13       planning to ensure that the results of the Program  
14       reach small and medium-sized entities.

15          “(6) DETAILEES.—Any Federal Government  
16       employee may be detailed to the National Program  
17       Office without reimbursement. Such detail shall be  
18       without interruption or loss of civil service status or  
19       privilege.

20          “(f) REPORTING AND AUDITING.—

21           “(1) ANNUAL REPORTS TO THE SECRETARY.—

22           “(A) IN GENERAL.—The Secretary shall  
23       require recipients of financial assistance under  
24       subsection (d)(1) to annually submit a report to  
25       the Secretary that describes the finances and

1 performance of the center for manufacturing in-  
2 novation for which such assistance was award-  
3 ed.

4 “(B) ELEMENTS.—Each report submitted  
5 under subparagraph (A) shall include—

6 “(i) an accounting of expenditures of  
7 amounts awarded to the recipient under  
8 subsection (d)(1); and

9 “(ii) a description of the performance  
10 of the center for manufacturing innovation  
11 with respect to—

12 “(I) its goals, plans, financial  
13 support, and accomplishments; and

14 “(II) how the center for manu-  
15 facturing innovation has furthered the  
16 purposes described in subsection  
17 (a)(2).

18 “(2) ANNUAL REPORTS TO CONGRESS.—

19 “(A) IN GENERAL.—Not less frequently  
20 than once each year, the Secretary shall submit  
21 a report to Congress that describes the per-  
22 formance of the Program during the most re-  
23 cent 1-year period.

1           “(B) ELEMENTS.—Each report submitted  
2           under subparagraph (A) shall include, for the  
3           period covered by the report—

4                   “(i) a summary and assessment of the  
5                   reports received by the Secretary under  
6                   paragraph (1);

7                   “(ii) an accounting of the funds ex-  
8                   pended by the Secretary under the Pro-  
9                   gram; and

10                  “(iii) an assessment of the Program  
11                  with respect to the purposes described in  
12                  subsection (a)(2).

13           “(3) TRIENNIAL ASSESSMENT BY GAO.—

14                  “(A) IN GENERAL.—Not less frequently  
15                  than once every 3 years, the Comptroller Gen-  
16                  eral of the United States shall submit to Con-  
17                  gress an assessment of the operation of the  
18                  Program during the most recent 3-year period.

19                  “(B) ELEMENTS.—Each assessment sub-  
20                  mitted under subparagraph (A) shall include,  
21                  for the period covered by the report—

22                   “(i) a review of the management, co-  
23                   ordination, and industry utility of the Pro-  
24                   gram;

1                   “(ii) an assessment of the extent to  
2                   which the Program has furthered the pur-  
3                   poses described in subsection (a)(2); and

4                   “(iii) such recommendations for legis-  
5                   lative and administrative action as the  
6                   Comptroller General considers appropriate  
7                   to improve the Program.

8                   “(g) ADDITIONAL AUTHORITIES.—

9                   “(1) APPOINTMENT OF PERSONNEL AND CON-  
10                  TRACTS.—The Secretary may appoint such per-  
11                  sonnel and enter into such contracts, financial as-  
12                  sistance agreements, and other agreements as the  
13                  Secretary considers necessary or appropriate to  
14                  carry out the Program including support for re-  
15                  search and development activities involving a center  
16                  for manufacturing innovation.

17                  “(2) TRANSFER OF FUNDS.—The Secretary  
18                  may transfer to other Federal agencies such sums as  
19                  the Secretary considers necessary or appropriate to  
20                  carry out the Program.

21                  “(3) AUTHORITY OF OTHER AGENCIES.—In the  
22                  event that the Secretary exercises the authority to  
23                  transfer funds to another agency under paragraph  
24                  (2), such agency may award and administer all as-

1       pects of financial assistance awards under this sec-  
2       tion.

3           “(4) USE OF RESOURCES.—In furtherance of  
4       the purposes of the Program, the Secretary may use,  
5       with the consent of a covered entity and with or  
6       without reimbursement, the land, services, equip-  
7       ment, personnel, and facilities of such covered entity.

8           “(5) ACCEPTANCE OF RESOURCES.—In addition  
9       to amounts appropriated to carry out the Program,  
10      the Secretary may accept funds, services, equipment,  
11      personnel, and facilities from any covered entity to  
12      carry out the Program.

13          “(6) COVERED ENTITY.—For purposes of this  
14      subsection, a covered entity is any Federal depart-  
15      ment, Federal agency, instrumentality of the United  
16      States, State, local government, tribal government,  
17      territory or possession of the United States, or of  
18      any political subdivision thereof, or international or-  
19      ganization, or any public or private entity or indi-  
20      vidual.

21          “(h) PATENTS.—Chapter 18 of title 35, United  
22      States Code, shall not apply if financial assistance is  
23      awarded under this section solely for the purpose of plan-  
24      ning, establishing, or supporting new or existing centers  
25      for manufacturing innovation.

1 “(i) FUNDING.—

2 “(1) NETWORK FOR MANUFACTURING INNOVA-  
3 TION FUND.—

4 “(A) ESTABLISHMENT.—There is estab-  
5 lished in the Treasury of the United States a  
6 fund to be known as the ‘Network for Manufac-  
7 turing Innovation Fund’ (referred to in this  
8 paragraph as the ‘Fund’).

9 “(B) ELEMENTS.—There shall be depos-  
10 ited in the Fund, which shall constitute the as-  
11 sets of the Fund, amounts appropriated or oth-  
12 erwise made available to carry out the Program.

13 “(C) AVAILABILITY.—Amounts deposited  
14 in the Fund shall be available to the Secretary,  
15 at the discretion of the Secretary, or the Sec-  
16 retary’s delegee, to carry out the Program with-  
17 out further appropriation and without fiscal  
18 year limitation.

19 “(2) AUTHORIZATION OF APPROPRIATIONS.—  
20 There is authorized to be appropriated  
21 \$600,000,000 to the Secretary to carry out this sec-  
22 tion.

23 “(3) ADMINISTRATIVE EXPENSES.—The Sec-  
24 retary may use not more than 5 percent of the  
25 amounts appropriated pursuant to paragraph (2) to



1       pay the salaries, expenses, and other administrative  
2       costs incurred by the Secretary under this section.”.

3   **SEC. 405. HOLLINGS MANUFACTURING EXTENSION PART-**  
4                   **NERSHIP.**

5       Section 25 of the National Institute of Standards and  
6   Technology Act (15 U.S.C. 278k) is amended to read as  
7   follows:

8   **“SEC. 25. HOLLINGS MANUFACTURING EXTENSION PART-**  
9                   **NERSHIP.**

10       “(a) ESTABLISHMENT AND PURPOSE.—

11               “(1) IN GENERAL.—The Secretary, through the  
12       Director shall provide assistance for the creation and  
13       support of regional manufacturing extension centers  
14       for the transfer of manufacturing technology and  
15       best business practices. These centers shall be  
16       known as the ‘Hollings Manufacturing Extension  
17       Centers’ (in this Act referred to as the ‘Centers’).  
18       The program under this section shall be known as  
19       the ‘Hollings Manufacturing Extension Partnership’.

20               “(2) AFFILIATIONS.—Such Centers shall be af-  
21       filiated with any United States-based public or non-  
22       profit institution or organization, or group thereof,  
23       that applies for and is awarded financial assistance  
24       under this section.

1           “(3) OBJECTIVE.—The objective of the pro-  
2           gram is to enhance productivity, competitiveness,  
3           and technological performance in United States  
4           manufacturing through—

5                   “(A) the transfer of manufacturing tech-  
6                   nology and techniques to Centers and, through  
7                   them, to manufacturing companies throughout  
8                   the United States;

9                   “(B) the participation of individuals from  
10                  industry, institutions of higher education, State  
11                  governments, other Federal agencies, and, when  
12                  appropriate, the Institute in cooperative tech-  
13                  nology transfer activities;

14                  “(C) efforts to make new manufacturing  
15                  technology and processes usable by United  
16                  States-based small and medium-sized compa-  
17                  nies;

18                  “(D) the active dissemination of scientific,  
19                  engineering, technical, and management infor-  
20                  mation about manufacturing to industrial firms,  
21                  including small and medium-sized manufac-  
22                  turing companies;

23                  “(E) the development of new partnerships,  
24                  networks, and services that will assist small and

1 medium-sized manufacturing companies expand  
2 into new markets, including global markets;

3 “(F) the utilization, when appropriate, of  
4 the expertise and capability that exists in Fed-  
5 eral laboratories other than the Institute; and

6 “(G) the provision to community colleges  
7 and area career and technical education schools  
8 of information about the job skills needed in  
9 small and medium-sized manufacturing busi-  
10 nesses in the regions they serve.

11 “(b) ACTIVITIES.—The activities of the Centers shall  
12 include—

13 “(1) the establishment of automated manufac-  
14 turing systems and other advanced production tech-  
15 nologies, based on research by the Institute and  
16 other entities, for the purpose of demonstrations and  
17 technology transfer;

18 “(2) assistance to Federal agencies in sup-  
19 porting United States-based manufacturing by iden-  
20 tifying and providing technical assistance to small  
21 and medium-sized manufacturers to help them meet  
22 Federal agency procurement and acquisition needs;

23 “(3) the active transfer and dissemination of re-  
24 search findings and Center expertise to a wide range

1 of companies and enterprises, particularly small and  
2 medium-sized manufacturers; and

3 “(4) the facilitation of collaborations and part-  
4 nerships between small and medium-sized manufac-  
5 turing companies and community colleges and area  
6 career and technical education schools to help such  
7 colleges and schools better understand the specific  
8 needs of manufacturers and to help manufacturers  
9 better understand the skill sets that students learn  
10 in the programs offered by such colleges and schools.

11 “(c) FINANCIAL ASSISTANCE AND REQUIRE-  
12 MENTS.—

13 “(1) FINANCIAL SUPPORT.—The Secretary may  
14 provide financial support to any Center created  
15 under subsection (a) for an initial period of 5 years,  
16 which may be renewed for an additional 5-year pe-  
17 riod. The Secretary may provide to a Center up to  
18 50 percent of the capital and annual operating and  
19 maintenance funds required to create and maintain  
20 such Center.

21 “(2) REGULATIONS.—The Secretary shall im-  
22 plement, review, and update the sections of the Code  
23 of Federal Regulations related to this section at  
24 least once every 5 years.

25 “(3) APPLICATION.—

1           “(A) IN GENERAL.—Any public or non-  
2           profit institution, or consortium thereof, may  
3           submit to the Secretary an application for fi-  
4           nancial support under this section, in accord-  
5           ance with the procedures established by the  
6           Secretary.

7           “(B) COST-SHARING.—In order to receive  
8           assistance under this section, an applicant for  
9           financial assistance under subparagraph (A)  
10          shall provide adequate assurances that non-  
11          Federal assets obtained from the applicant and  
12          the applicant’s partnering organizations will be  
13          used as a funding source to meet not less than  
14          50 percent of the costs incurred. For purposes  
15          of the preceding sentence, the costs incurred  
16          means the costs incurred in connection with the  
17          activities undertaken to improve the manage-  
18          ment, productivity, competitiveness, and techno-  
19          logical performance of small and medium-sized  
20          manufacturing companies.

21          “(C) AGREEMENTS WITH OTHER ENTI-  
22          TIES.—In meeting the 50-percent requirement,  
23          it is anticipated that a Center will enter into  
24          agreements with other entities such as private  
25          industry, institutions of higher education, and

1 State governments to accomplish programmatic  
2 objectives and access new and existing resources  
3 that will further the impact of the Federal in-  
4 vestment made on behalf of small and medium-  
5 sized manufacturing companies.

6 “(D) LEGAL RIGHTS.—Each applicant  
7 under subparagraph (A) shall submit a proposal  
8 for the allocation of the legal rights associated  
9 with any invention that may result from the  
10 proposed Center’s activities.

11 “(4) MERIT REVIEW.—The Secretary shall sub-  
12 ject each such application to merit review. In mak-  
13 ing a decision whether to approve such application  
14 and provide financial support under this section, the  
15 Secretary shall consider, at a minimum, the fol-  
16 lowing:

17 “(A) The merits of the application, par-  
18 ticularly those portions of the application re-  
19 garding technology transfer, training and edu-  
20 cation, and adaptation of manufacturing tech-  
21 nologies to the needs of particular industrial  
22 sectors.

23 “(B) The quality of service to be provided.

24 “(C) Geographical diversity and extent of  
25 service area.

1           “(D) The percentage of funding and  
2           amount of in-kind commitment from other  
3           sources.

4           “(5) EVALUATION.—

5           “(A) IN GENERAL.—Each Center that re-  
6           ceives financial assistance under this section  
7           shall be evaluated during its third year of oper-  
8           ation by an evaluation panel appointed by the  
9           Secretary.

10          “(B) COMPOSITION.—Each such evalua-  
11          tion panel shall be composed of independent ex-  
12          perts, none of whom shall be connected with the  
13          involved Center, and Federal officials.

14          “(C) CHAIR.—An official of the Institute  
15          shall chair the panel.

16          “(D) PERFORMANCE MEASUREMENT.—  
17          Each evaluation panel shall measure the in-  
18          volved Center’s performance against the objec-  
19          tives specified in this section.

20          “(E) POSITIVE EVALUATION.—If the eval-  
21          uation is positive, the Secretary may provide  
22          continued funding through the fifth year.

23          “(F) CORRECTIVE ACTION PLAN.—The  
24          Secretary may not provide funding for the re-  
25          maining years of a Center’s operation unless

1 the evaluation is positive. A Center that has not  
2 received a positive evaluation by the evaluation  
3 panel shall be notified by the panel of the defi-  
4 ciencies in its performance and shall be placed  
5 on a corrective action plan and provided the op-  
6 portunity to address deficiencies unless imme-  
7 diate action is necessary to protect the public  
8 interest. The program shall re-evaluate the Cen-  
9 ter within one year and if the Center has not  
10 addressed the deficiencies identified by the  
11 panel, or shown a significant improvement in its  
12 performance, the Director shall conduct a new  
13 competition or may close the Center.

14 “(G) ADDITIONAL FINANCIAL SUPPORT.—

15 After the fifth year, a Center may receive addi-  
16 tional financial support under this section if it  
17 has received a positive evaluation through an  
18 independent review, under procedures estab-  
19 lished by the Institute.

20 “(H) RECOMPETITION.—If a Center has

21 received financial support for 10 consecutive  
22 years, the Director shall conduct a new com-  
23 petition. An existing Center may submit an ap-  
24 plication as part of the new competition.



1           “(I) RECOMPETITION PLAN.—Not later  
2           than 180 days after the date of enactment of  
3           the America Competes Reauthorization Act of  
4           2014, the Director shall submit a plan to the  
5           Committee on Science, Space, and Technology  
6           of the House of Representatives and the Com-  
7           mittee on Commerce, Science, and Transpor-  
8           tation of the Senate detailing how the program  
9           will implement the new competitions required  
10          under subparagraph (H). The Director shall  
11          consult with the MEP Advisory Board estab-  
12          lished under subsection (f) in the development  
13          and implementation of the plan.

14          “(6) OVERSIGHT BOARD.—

15               “(A) IN GENERAL.—Each Center that re-  
16               ceives financial assistance under this section  
17               shall establish an oversight board that is broad-  
18               ly representative of regional stakeholders with a  
19               majority of board members drawn from local  
20               small and medium-sized manufacturing firms.

21               “(B) BYLAWS AND CONFLICT OF INTER-  
22               EST.—Each board under subparagraph (A)  
23               shall adopt and submit to the Director bylaws  
24               to govern the operation of the board, including  
25               a conflict of interest policy to ensure relevant

1 relationships are disclosed and proper recusal  
2 procedures are in place.

3 “(C) LIMITATION.—Board members may  
4 not serve simultaneously on more than one Cen-  
5 ter’s oversight board or serve as a contractor  
6 providing services to a Center.

7 “(7) PROTECTION OF CONFIDENTIAL INFORMA-  
8 TION.—The Secretary shall ensure that the following  
9 are not publically disclosed:

10 “(A) Confidential information on the busi-  
11 ness operations of—

12 “(i) a participant under the program;

13 or

14 “(ii) a client of a Center.

15 “(B) Trade secrets possessed by any client  
16 of a Center.

17 “(8) PATENT RIGHTS.—The provisions of chap-  
18 ter 18 of title 35, United States Code, shall apply,  
19 to the extent not inconsistent with this section, to  
20 the promotion of technology from research by Cen-  
21 ters under this section except for contracts for such  
22 specific technology extension or transfer services as  
23 may be specified by statute or by the Director.

24 “(d) REPORTING AND AUDITING REQUIREMENTS.—

25 The Director shall establish procedures regarding Center

1 financial reporting and auditing to ensure that awards are  
2 used for the purposes specified in this section and are in  
3 accordance with sound accounting practices.

4 “(e) ACCEPTANCE OF FUNDS.—

5 “(1) IN GENERAL.—In addition to such sums  
6 as may be appropriated to the Secretary and Direc-  
7 tor to operate the Hollings Manufacturing Extension  
8 Partnership, the Secretary and Director also may  
9 accept funds from other Federal departments and  
10 agencies and, under section 2(c)(7), from the private  
11 sector for the purpose of strengthening United  
12 States manufacturing.

13 “(2) ALLOCATION OF FUNDS.—

14 “(A) FUNDS ACCEPTED FROM OTHER FED-  
15 ERAL DEPARTMENTS OR AGENCIES.—The Di-  
16 rector shall determine whether funds accepted  
17 from other Federal departments or agencies  
18 shall be counted in the calculation of the Fed-  
19 eral share of capital and annual operating and  
20 maintenance costs under subsection (c).

21 “(B) FUNDS ACCEPTED FROM THE PRI-  
22 VATE SECTOR.—Funds accepted from the pri-  
23 vate sector under section 2(c)(7), if allocated to  
24 a Center, may not be considered in the calcula-

1           tion of the Federal share under subsection (c)  
2           of this section.

3           “(f) MEP ADVISORY BOARD.—

4                 “(1) ESTABLISHMENT.—There is established  
5           within the Institute a Manufacturing Extension  
6           Partnership Advisory Board (in this subsection re-  
7           ferred to as the ‘MEP Advisory Board’).

8                 “(2) MEMBERSHIP.—

9                         “(A) IN GENERAL.—The MEP Advisory  
10           Board shall consist of not fewer than 10 mem-  
11           bers broadly representative of stakeholders, to  
12           be appointed by the Director. At least 2 mem-  
13           bers shall be employed by or on an advisory  
14           board for the Centers, at least 1 member shall  
15           represent a community college, and at least 5  
16           other members shall be from United States  
17           small businesses in the manufacturing sector.  
18           No member shall be an employee of the Federal  
19           Government.

20                        “(B) TERM.—Except as provided in sub-  
21           paragraph (C) or (D), the term of office of each  
22           member of the MEP Advisory Board shall be 3  
23           years.

24                        “(C) VACANCIES.—Any member appointed  
25           to fill a vacancy occurring prior to the expira-

1           tion of the term for which his predecessor was  
2           appointed shall be appointed for the remainder  
3           of such term.

4           “(D) SERVING CONSECUTIVE TERMS.—  
5           Any person who has completed two consecutive  
6           full terms of service on the MEP Advisory  
7           Board shall thereafter be ineligible for appoint-  
8           ment during the one-year period following the  
9           expiration of the second such term.

10          “(3) MEETINGS.—The MEP Advisory Board  
11         shall meet not less than 2 times annually and shall  
12         provide to the Director—

13                 “(A) advice on Hollings Manufacturing  
14                 Extension Partnership programs, plans, and  
15                 policies;

16                 “(B) assessments of the soundness of Hol-  
17                 lings Manufacturing Extension Partnership  
18                 plans and strategies; and

19                 “(C) assessments of current performance  
20                 against Hollings Manufacturing Extension  
21                 Partnership program plans.

22          “(4) FEDERAL ADVISORY COMMITTEE ACT AP-  
23         PLICABILITY.—

24                 “(A) IN GENERAL.—In discharging its du-  
25                 ties under this subsection, the MEP Advisory

1 Board shall function solely in an advisory ca-  
2 pacity, in accordance with the Federal Advisory  
3 Committee Act.

4 “(B) EXCEPTION.—Section 14 of the Fed-  
5 eral Advisory Committee Act shall not apply to  
6 the MEP Advisory Board.

7 “(5) REPORT.—The MEP Advisory Board shall  
8 transmit an annual report to the Secretary for  
9 transmittal to Congress within 30 days after the  
10 submission to Congress of the President’s annual  
11 budget request in each year. Such report shall ad-  
12 dress the status of the program established pursuant  
13 to this section and comment on the relevant sections  
14 of the programmatic planning document and updates  
15 thereto transmitted to Congress by the Director  
16 under subsections (c) and (d) of section 23.

17 “(g) COMPETITIVE GRANT PROGRAM.—

18 “(1) ESTABLISHMENT.—The Director shall es-  
19 tablish, within the Hollings Manufacturing Exten-  
20 sion Partnership, a program of competitive awards  
21 among participants described in paragraph (2) for  
22 the purposes described in paragraph (3).

23 “(2) PARTICIPANTS.—Participants receiving  
24 awards under this subsection shall be the Centers, or  
25 a consortium of such Centers.

1           “(3) PURPOSE.—The purpose of the program  
2           under this subsection is to add capabilities to the  
3           Hollings Manufacturing Extension Partnership, in-  
4           cluding the development of projects to solve new or  
5           emerging manufacturing problems as determined by  
6           the Director, in consultation with the Director of the  
7           Hollings Manufacturing Extension Partnership, the  
8           MEP Advisory Board, and small and medium-sized  
9           manufacturers.

10           “(4) THEMES.—One or more themes for the  
11           competition may be identified, which may vary from  
12           year to year, depending on the needs of manufactur-  
13           ers and the success of previous competitions. These  
14           themes may include—

15                   “(A) supply chain integration and quality  
16                   management;

17                   “(B) the creation of partnerships to en-  
18                   courage the development of a workforce with  
19                   the skills necessary to meet the needs of a re-  
20                   gion, including the creation of apprenticeship  
21                   opportunities and the adoption of universally  
22                   recognized credential programs, as appropriate;

23                   “(C) energy efficiency, including efficient  
24                   building technologies and environmentally  
25                   friendly materials, products, and processes;

1           “(D) enhancing the competitiveness of  
2           small and medium-sized manufacturers in the  
3           global marketplace;

4           “(E) the transfer of technology based on  
5           the technological needs of manufacturers and  
6           available technologies from institutions of high-  
7           er education, laboratories, and other technology  
8           producing entities; and

9           “(F) areas that extend beyond traditional  
10          areas of manufacturing extension activities, in-  
11          cluding projects related to construction industry  
12          modernization.

13          “(5) REIMBURSEMENT.—Centers may be reim-  
14          bursed for costs incurred under the program under  
15          this subsection.

16          “(6) APPLICATIONS.—Applications for awards  
17          under this subsection shall be submitted in such  
18          manner, at such time, and containing such informa-  
19          tion as the Director shall require, in consultation  
20          with the MEP Advisory Board.

21          “(7) SELECTION.—Awards under this sub-  
22          section shall be peer reviewed and competitively  
23          awarded. The Director shall endeavor to have broad  
24          geographic diversity among selected proposals. The



1 Director shall select proposals to receive awards that  
2 will—

3 “(A) utilize innovative or collaborative ap-  
4 proaches to solving the problem described in the  
5 competition;

6 “(B) improve the competitiveness of indus-  
7 tries in the region in which the Center or Cen-  
8 ters are located; and

9 “(C) contribute to the long-term economic  
10 stability of that region, including the creation of  
11 jobs or training employees.

12 “(8) PROGRAM CONTRIBUTION.—Recipients of  
13 awards under this subsection shall not be required  
14 to provide a matching contribution.

15 “(9) DURATION.—Awards under this subsection  
16 shall last no longer than 5 years.

17 “(h) INNOVATIVE SERVICES INITIATIVE.—

18 “(1) ESTABLISHMENT.—The Director, in co-  
19 ordination with the Advanced Manufacturing Office  
20 of the Department of Energy, shall establish, within  
21 the Hollings Manufacturing Extension Partnership,  
22 an innovative services initiative to assist small and  
23 medium-sized manufacturers in—

1           “(A) reducing their energy usage, green-  
2           house gas emissions, and environmental waste  
3           to improve profitability;

4           “(B) accelerating the domestic commer-  
5           cialization of new product technologies, includ-  
6           ing components for renewable energy and en-  
7           ergy efficiency systems; and

8           “(C) identifying and diversifying to new  
9           markets, including support for transitioning to  
10          the production of components for renewable en-  
11          ergy and energy efficiency systems.

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

18          “(i) EXPORT ASSISTANCE TO SMALL AND MEDIUM-  
19          SIZED MANUFACTURERS.—

20               “(1) IN GENERAL.—The Director shall—

21               “(A) evaluate obstacles that are unique to  
22               small and medium-sized manufacturers that  
23               prevent such manufacturers from effectively  
24               competing in the global market;

1           “(B) implement a comprehensive export  
2           assistance initiative through the Centers to help  
3           small and medium-sized manufacturers address  
4           such obstacles; and

5           “(C) to the maximum extent practicable,  
6           ensure that the activities carried out under this  
7           subsection are coordinated with, and do not du-  
8           plicate the efforts of, other export assistance  
9           programs within the Federal Government.

10          “(2) REQUIREMENTS.—The initiative shall in-  
11          clude—

12               “(A) export assistance counseling;

13               “(B) the development of partnerships that  
14               will provide small and medium-sized manufac-  
15               turers with greater access to and knowledge of  
16               global markets; and

17               “(C) improved communication between the  
18               Centers to assist such manufacturers in imple-  
19               menting appropriate, targeted solutions to such  
20               obstacles.

21          “(j) DEFINITIONS.—In this section:

22               “(1) AREA CAREER AND TECHNICAL EDU-  
23               CATION SCHOOL.—The term ‘area career and tech-  
24               nical education school’ has the meaning given such  
25               term in section 3 of the Carl D. Perkins Career and

1        Technical Education Improvement Act of 2006 (20  
2        U.S.C. 2302).

3            “(2) COMMUNITY COLLEGE.—The term ‘com-  
4        munity college’ means an institution of higher edu-  
5        cation (as defined under section 101(a) of the High-  
6        er Education Act of 1965 (20 U.S.C. 1001(a))) at  
7        which the highest degree that is predominately  
8        awarded to students is an associate’s degree.”.

9        **SEC. 406. BIOSCIENCE MEASUREMENT SCIENCE AND**  
10       **STANDARDS.**

11        (a) IN GENERAL.—The National Institute of Stand-  
12       ards and Technology Act (15 U.S.C. 271 et seq.) is  
13       amended by inserting after section 34, as added by section  
14       404 of this Act, the following:

15       **“SEC. 35. BIOSCIENCE MEASUREMENT SCIENCE AND**  
16       **STANDARDS.**

17        “The Director shall—

18            “(1) establish a bioscience research program to  
19        support the development of standards and measure-  
20        ments and to create new data, tools, techniques, and  
21        processes necessary to promote new research and in-  
22        dustries at the intersection of the biological, phys-  
23        ical, and information sciences and engineering;

24            “(2) provide access to user facilities with ad-  
25        vanced or unique equipment, services, materials, and

1 other resources to industry, institutions of higher  
2 education, nonprofit organizations, and government  
3 agencies to perform research and testing related to  
4 the biosciences program established under this sec-  
5 tion; and

6 “(3) provide technical expertise to inform the  
7 development of guidelines and safeguards for new  
8 products, processes, and systems that may result  
9 from advancements at the intersection of the biologi-  
10 cal, physical, and information sciences and engineer-  
11 ing.”.

12 **SEC. 407. NATIONAL ACADEMY OF SCIENCES REVIEW.**

13 Not later than 6 months after the date of enactment  
14 of this Act, the Director of the National Institute of  
15 Standards and Technology shall enter into a contract with  
16 the National Academy of Sciences to conduct a single,  
17 comprehensive review of the Institute’s laboratory pro-  
18 grams. The review shall—

- 19 (1) assess the technical merits and scientific  
20 caliber of the research conducted at the laboratories;  
21 (2) examine the strengths and weaknesses of  
22 the 2010 laboratory reorganization on the Institute’s  
23 ability to fulfill its mission;

1           (3) evaluate how cross-cutting research and de-  
2           velopment activities are planned, coordinated, and  
3           executed across the laboratories; and

4           (4) assess how the laboratories are engaging in-  
5           dustry, including the incorporation of industry need,  
6           into the research goals and objectives of the Insti-  
7           tute.

8   **SEC. 408. IMPROVING NIST COLLABORATION WITH OTHER**  
9                           **AGENCIES.**

10          Section 8 of the National Bureau of Standards Au-  
11          thorization Act for Fiscal Year 1983 (15 U.S.C. 275b)  
12          is amended—

13               (1) in the section heading, by inserting “AND  
14               WITH” after “PERFORMED FOR”; and

15               (2) by adding at the end the following: “The  
16               Secretary may accept, apply for, use, and spend  
17               Federal, State, and non-governmental acquisition  
18               and assistance funds to further the mission of the  
19               Institute without regard to the source or the period  
20               of availability of these funds as well as share per-  
21               sonnel, associates, facilities, and property with these  
22               partner organizations, with or without reimburse-  
23               ment, upon mutual agreement.”.

1 **SEC. 409. MISCELLANEOUS PROVISIONS.**

2 (a) FUNCTIONS AND ACTIVITIES.—Section 15 of the  
3 of the National Institute of Standards and Technology Act  
4 (15 U.S.C. 278e) is amended—

5 (1) by striking “of the Government; and” and  
6 inserting “of the Government;”;

7 (2) by striking “transportation services for em-  
8 ployees of the Institute” and inserting “transpor-  
9 tation services for employees, associates, or fellows  
10 of the Institute”; and

11 (3) by striking “Code.” and inserting “Code;  
12 and (i) the protection of Institute buildings and  
13 other plant facilities, equipment, and property, and  
14 of employees, associates, visitors, or other persons  
15 located therein or associated therewith, notwith-  
16 standing any other provision of law.”.

17 (b) POST-DOCTORAL FELLOWSHIP PROGRAM.—Sec-  
18 tion 19 of the National Institute of Standards and Tech-  
19 nology Act (15 U.S.C. 278g–2) is amended to read as fol-  
20 lows:

21 **“SEC. 19. POST-DOCTORAL FELLOWSHIP PROGRAM.**

22 “The Director, in conjunction with the National  
23 Academy of Sciences, shall establish and conduct a post-  
24 doctoral fellowship program that shall include not less  
25 than 20 new fellows per fiscal year. In evaluating applica-  
26 tions for fellowships under this section, the Director shall

1 give consideration to the goal of promoting the participa-  
2 tion of underrepresented minorities in research areas sup-  
3 ported by the Institute.”.

## 4 **TITLE V—INNOVATION**

### 5 **SEC. 501. OFFICE OF INNOVATION AND ENTREPRENEUR-** 6 **SHIP.**

7 Section 25 of the Stevenson-Wydler Technology Inno-  
8 vation Act of 1980 (15 U.S.C. 3720) is amended—

9 (1) in subsection (a) by inserting “with a Direc-  
10 tor and full-time staff” after “Office of Innovation  
11 and Entrepreneurship”;

12 (2) in subsection (b)—

13 (A) by amending paragraph (3) to read as  
14 follows:

15 “(3) providing access to relevant data, research,  
16 and technical assistance on innovation and commer-  
17 cialization, including best practices for university-  
18 based incubators and accelerators;”;

19 (B) by redesignating paragraphs (4) and  
20 (5) as paragraphs (6) and (7), respectively; and

21 (C) by inserting the following after para-  
22 graph (3):

23 “(4) overseeing the implementation of the loan  
24 guarantee programs and the Regional Innovation



1       Program established under sections 26 and 27, re-  
2       spectively;

3               “(5) developing, within 180 days after the date  
4       of enactment of the America Competes Reauthoriza-  
5       tion Act of 2014, and updating at least every 5  
6       years, a strategic plan to guide the activities of the  
7       Office of Innovation and Entrepreneurship that  
8       shall—

9               “(A) specify and prioritize near-term and  
10       long-term goals, objectives, and policies to ac-  
11       celerate innovation and advance the commer-  
12       cialization of research and development, includ-  
13       ing federally funded research and development,  
14       set forth the anticipated time for achieving the  
15       objectives, and identify metrics for use in as-  
16       sessing progress toward such objectives;

17              “(B) describe how the Department of  
18       Commerce is working in conjunction with other  
19       Federal agencies to foster innovation and com-  
20       mercialization across the United States; and

21              “(C) provide a summary of the activities,  
22       including the development of metrics to evalu-  
23       ate regional innovation strategies undertaken  
24       through the Regional Innovation Research and

1 Information Program established under section  
2 27(e);”;

3 (3) by amending subsection (c) to read as fol-  
4 lows:

5 “(c) ADVISORY COMMITTEE.—

6 “(1) ESTABLISHMENT.—The Secretary shall es-  
7 tablish or designate an advisory committee, which  
8 shall meet at least twice each fiscal year, to provide  
9 advice to the Secretary on carrying out the duties  
10 and responsibilities of the Office of Innovation and  
11 Entrepreneurship.

12 “(2) REPORT TO CONGRESS.—The advisory  
13 committee shall prepare a report, to be submitted to  
14 the Committee on Science, Space, and Technology of  
15 the House of Representatives and the Committee on  
16 Commerce, Science, and Transportation of the Sen-  
17 ate every 3 years. The first report shall be submitted  
18 not later than 1 year after the date of enactment of  
19 the America Competes Reauthorization Act of 2014  
20 and shall include—

21 “(A) an assessment of the strategic plan  
22 developed under subsection (b)(5) and the  
23 progress made in implementing the plan and  
24 the duties of the Office of Innovation and En-  
25 trepreneurship;

1           “(B) an assessment of how the Office of  
 2           Innovation and Entrepreneurship is working  
 3           with other Federal agencies to meet the goals  
 4           and duties of the office; and

5           “(C) any recommendations for how the Of-  
 6           fice of Innovation and Entrepreneurship could  
 7           be improved.”; and

8           (4) by adding at the end the following:

9           “(d) AUTHORIZATION OF APPROPRIATIONS.—There  
 10          are authorized to be appropriated to the Secretary  
 11          \$5,000,000 for each of fiscal years 2015 through 2019  
 12          to carry out this section.”.

13       **SEC. 502. FEDERAL LOAN GUARANTEES FOR INNOVATIVE**  
 14                               **TECHNOLOGIES IN MANUFACTURING.**

15          Section 26(t) of the Stevenson-Wydler Technology  
 16          Innovation Act of 1980 (15 U.S.C. 3721(t)) is amended  
 17          by striking “fiscal years 2011 through 2013” and insert-  
 18          ing “fiscal years 2014 through 2018”.

19       **SEC. 503. REGIONAL INNOVATION PROGRAM.**

20          Section 27 of the Stevenson-Wydler Technology Inno-  
 21          vation Act of 1980 (15 U.S.C. 3722) is amended—

22               (1) in subsection (b), by adding at the end the  
 23          following:

24               “(8) OUTREACH TO RURAL COMMUNITIES.—

25          The Secretary shall conduct outreach to public and

1 private sector entities in rural communities to en-  
 2 courage those entities to participate in regional inno-  
 3 vation cluster activities under this subsection.

4 “(9) FUNDING.—The Secretary may accept  
 5 funds from other Federal agencies to support grants  
 6 and activities under this subsection.”; and

7 (2) in subsection (i), by striking “fiscal years  
 8 2011 through 2013” and inserting “fiscal years  
 9 2015 through 2019”.

10 **SEC. 504. INNOVATION VOUCHER PILOT PROGRAM.**

11 Section 25 of the Stevenson-Wydler Technology Inno-  
 12 vation Act of 1980 (15 U.S.C. 3720) as amended by sec-  
 13 tion 501 of this Act, is further amended by adding at the  
 14 end the following:

15 “(e) INNOVATION VOUCHER PILOT PROGRAM.—

16 “(1) IN GENERAL.—The Secretary, acting  
 17 through the Office of Innovation and Entrepreneur-  
 18 ship and in conjunction with the States, shall estab-  
 19 lish an innovation voucher pilot program to accel-  
 20 erate innovative activities and enhance the competi-  
 21 tiveness of small and medium-sized manufacturers in  
 22 the United States. The pilot program shall—

23 “(A) foster collaborations between small  
 24 and medium-sized manufacturers and research  
 25 institutions; and

1           “(B) enable small and medium-sized man-  
2           ufacturers to access technical expertise and ca-  
3           pabilities that will lead to the development of  
4           innovative products or manufacturing processes,  
5           including through—

6                   “(i) research and development, includ-  
7                   ing proof of concept, technical develop-  
8                   ment, and compliance testing activities;

9                   “(ii) early-stage product development,  
10                  including engineering design services; and

11                  “(iii) technology transfer and related  
12                  activities.

13           “(2) AWARD SIZE.—The Secretary shall com-  
14           petitively award vouchers worth up to \$20,000 to  
15           small and medium-sized manufacturers for use at el-  
16           igible research institutions to acquire the services de-  
17           scribed in paragraph (1)(B).

18           “(3) STREAMLINED PROCEDURES.—The Sec-  
19           retary shall streamline and simplify the application,  
20           administrative, and reporting procedures for vouch-  
21           ers administered under the program.

22           “(4) REGULATIONS.—Prior to awarding any  
23           vouchers under the program, the Secretary shall pro-  
24           mulgate regulations—

1           “(A) establishing criteria for the selection  
2           of recipients of awards under this subsection;

3           “(B) establishing procedures regarding fi-  
4           nancial reporting and auditing—

5                 “(i) to ensure that awards are used  
6                 for the purposes of the program; and

7                 “(ii) that are in accordance with  
8                 sound accounting practices; and

9           “(C) describing any other policies, proce-  
10           dures, or information necessary to implement  
11           this subsection, including those intended to  
12           streamline and simplify the program in accord-  
13           ance with paragraph (3).

14           “(5) TRANSFER AUTHORITY.—The Secretary  
15           may transfer funds appropriated to the Department  
16           of Commerce to other Federal agencies for the per-  
17           formance of services authorized under this sub-  
18           section.

19           “(6) ADMINISTRATIVE COSTS.—All of the  
20           amounts appropriated to carry out this subsection  
21           for a fiscal year shall be used for vouchers awarded  
22           under this subsection, except that the Secretary may  
23           set aside a percentage of such amounts for eligible  
24           research institutions performing the services de-  
25           scribed in paragraph (1)(B) to defray administrative

1 costs associated with the services. The Secretary  
2 shall establish a single, fixed percentage for such  
3 purposes that will apply to all eligible research insti-  
4 tutions.

5 “(7) OUTREACH.—The Secretary may use cen-  
6 ters established under section 25 of the National In-  
7 stitute of Standards and Technology Act (15 U.S.C.  
8 278k) to provide information about the program es-  
9 tablished under this subsection and to conduct out-  
10 reach to potential applicants, as appropriate.

11 “(8) REPORTS TO CONGRESS.—

12 “(A) PLAN.—Not later than 180 days  
13 after the date of enactment of the America  
14 Competes Reauthorization Act of 2014, the  
15 Secretary shall transmit to Congress a plan  
16 that will serve as a guide for the activities of  
17 the program. The plan shall include a descrip-  
18 tion of the specific objectives of the program  
19 and the metrics that will be used in assessing  
20 progress toward those objectives.

21 “(B) OUTCOMES.—Not later than 3 years  
22 after the date of enactment of the America  
23 Competes Reauthorization Act of 2014, the  
24 Secretary shall transmit to Congress a report  
25 containing—

1 “(i) a summary of the activities car-  
 2 ried out under this subsection;

3 “(ii) an assessment of the impact of  
 4 such activities on the innovative capacity of  
 5 small and medium-sized manufacturers re-  
 6 ceiving assistance under the pilot program;  
 7 and

8 “(iii) any recommendations for admin-  
 9 istrative and legislative action that could  
 10 optimize the effectiveness of the pilot pro-  
 11 gram.

12 “(9) COORDINATION AND NONDUPLICATION.—  
 13 To the maximum extent practicable, the Secretary  
 14 shall ensure that the activities carried out under this  
 15 subsection are coordinated with, and do not dupli-  
 16 cate the efforts of, other programs within the Fed-  
 17 eral Government.

18 “(10) ELIGIBLE RESEARCH INSTITUTIONS DE-  
 19 FINED.—For the purposes of this subsection, the  
 20 term ‘eligible research institution’ means—

21 “(A) an institution of higher education, as  
 22 such term is defined in section 101(a) of the  
 23 Higher Education Act of 1965 (20 U.S.C.  
 24 1001(a));

25 “(B) a Federal laboratory;



1           “(C) a federally funded research and devel-  
2           opment center; or

3           “(D) a Hollings Manufacturing Extension  
4           Center established under section 25 of the Na-  
5           tional Institute of Standards and Technology  
6           Act (15 U.S.C. 278k).

7           “(11) AUTHORIZATION OF APPROPRIATIONS.—  
8           There are authorized to be appropriated to the Sec-  
9           retary to carry out the pilot program in this sub-  
10          section \$5,000,000 for each of fiscal years 2015  
11          through 2019.”.

12 **SEC. 505. FEDERAL ACCELERATION OF STATE TECH-**  
13 **NOLOGY COMMERCIALIZATION PILOT PRO-**  
14 **GRAM.**

15          The Stevenson-Wydler Technology Innovation Act of  
16 1980 (15 U.S.C. 3701 et seq.) is amended by adding at  
17 the end the following:

18 **“SEC. 28. FEDERAL ACCELERATION OF STATE TECH-**  
19 **NOLOGY COMMERCIALIZATION PILOT PRO-**  
20 **GRAM.**

21          “(a) AUTHORITY.—

22               “(1) ESTABLISHMENT.—The Secretary shall es-  
23               tablish a Federal Acceleration of State Technology  
24               Commercialization Pilot Program or FAST Com-  
25               mercialization Pilot Program to award grants to

1 States, or consortia thereof, for the purposes de-  
2 scribed in paragraph (2). Awards under this section  
3 shall be made through a competitive, merit-based  
4 process.

5 “(2) PURPOSE.—The purpose of the program  
6 under this section is to advance United States pro-  
7 ductivity and global competitiveness by accelerating  
8 commercialization of innovative technology by  
9 leveraging Federal support for State commercializa-  
10 tion efforts. The program shall provide matching  
11 funds to a State, or consortium thereof, for the ac-  
12 celeration of commercialization activities and the  
13 promotion of small manufacturing enterprises in the  
14 United States.

15 “(b) APPLICATION.—Applications for awards under  
16 this section shall be submitted in such a manner, at such  
17 a time, and containing such information as the Secretary  
18 shall require, including—

19 “(1) a description of the current state of tech-  
20 nology commercialization in the State or States, in-  
21 cluding successes and barriers to commercialization;  
22 and

23 “(2) a description of the State’s or consortium’s  
24 plan for increasing commercialization of new tech-  
25 nologies, products, processes, and services.

1       “(c) SELECTION CRITERIA.—The Secretary shall es-  
2     tablish criteria for the selection of awardees, which shall  
3     consider at a minimum a review of efforts during the fiscal  
4     year prior to submitting an application to—

5               “(1) promote manufacturing; and

6               “(2) commercialize new technologies, products,  
7     processes, and services, including activities to trans-  
8     late federally funded research and technologies to  
9     small manufacturing enterprises.

10       “(d) MATCHING REQUIREMENT.—A State or consor-  
11     tium receiving a grant under this section shall provide  
12     non-Federal cash contributions in an amount equal to 50  
13     percent of the total cost of the project for which the grant  
14     is provided.

15       “(e) COORDINATION AND NONDUPLICATION.—In  
16     carrying out the program under this section, the Secretary  
17     shall ensure that grants made under the program are co-  
18     ordinated with, and do not duplicate, the efforts of other  
19     commercialization programs within the Federal Govern-  
20     ment.

21       “(f) EVALUATION.—

22               “(1) IN GENERAL.—Not later than 3 years  
23     after the date of enactment of the America Com-  
24     petes Reauthorization Act of 2014, the Secretary  
25     shall enter into a contract with an independent enti-

1 ty, such as the National Academy of Sciences, to  
2 conduct an evaluation of the program established  
3 under subsection (a).

4 “(2) REQUIREMENTS.—The evaluation shall—

5 “(A) assess whether the program is achiev-  
6 ing its goals;

7 “(B) include any recommendations for how  
8 the program may be improved; and

9 “(C) include a recommendation as to  
10 whether the program should be continued or  
11 terminated.

12 “(g) DEFINITIONS.—In this section—

13 “(1) the term ‘State’ has the meaning given  
14 that term in section 3 of the Public Works and Eco-  
15 nomic Development Act of 1965 (42 U.S.C. 3122);  
16 and

17 “(2) the term ‘commercialization’ has the  
18 meaning given that term in section 9(e)(10) of the  
19 Small Business Act (15 U.S.C. 638(e)(10)).

20 “(h) DURATION.—Each award shall be for a 5-year  
21 period.

22 “(i) AUTHORIZATION OF APPROPRIATIONS.—There  
23 are authorized to be appropriated to the Secretary  
24 \$50,000,000 for each of fiscal years 2015 through 2017  
25 to carry out this section.”.

1 **SEC. 506. NATIONAL ACADEMIES REPORT ON UNIVERSITY**  
2 **INCUBATORS AND ACCELERATORS.**

3 Not later than 1 year after the date of enactment  
4 of this Act, the Secretary of Commerce shall enter into  
5 a contract with the National Academy of Sciences to con-  
6 duct a study on the role of incubators and accelerators,  
7 including university-based incubators and accelerators, in  
8 the commercialization of federally funded research and re-  
9 gional economic development. The study shall—

10 (1) examine the effectiveness of incubators and  
11 accelerators in stimulating the creation of start-ups,  
12 including metrics for comparing start-ups that have  
13 and have not completed incubator or accelerator pro-  
14 grams, and developing regional innovation clusters;  
15 and

16 (2) identify best practices in the structure,  
17 goals, operation, management, and funding mecha-  
18 nisms of leading incubators and accelerators.

19 **TITLE VI—DEPARTMENT OF**  
20 **ENERGY**

21 **Subtitle A—Office of Science**

22 **SEC. 601. SHORT TITLE.**

23 This subtitle may be cited as the “Department of En-  
24 ergy Office of Science Authorization Act of 2014”.

25 **SEC. 602. DEFINITIONS.**

26 Except as otherwise provided, in this subtitle:

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

3           (2) DIRECTOR.—The term “Director” means  
4 the Director of the Office of Science.

5           (3) OFFICE OF SCIENCE.—The term “Office of  
6 Science” means the Department of Energy Office of  
7 Science.

8           (4) UNDER SECRETARY.—The term “Under  
9 Secretary” means the Under Secretary for Science  
10 and Energy.

11           (5) SECRETARY.—The term “Secretary” means  
12 the Secretary of Energy.

13 **SEC. 603. MISSION OF THE OFFICE OF SCIENCE.**

14       Section 209 of the Department of Energy Organiza-  
15 tion Act (42 U.S.C. 7139) is amended by adding at the  
16 end the following:

17       “(c) MISSION.—The mission of the Office of Science  
18 shall be the delivery of scientific discoveries, capabilities,  
19 and major scientific tools to transform the understanding  
20 of nature and to advance the energy, economic, and na-  
21 tional security of the United States.

22       “(d) DUTIES.—In support of this mission, the Direc-  
23 tor shall carry out programs, including those in basic en-  
24 ergy sciences, biological and environmental research, ad-  
25 vanced scientific computing research, fusion energy

1 sciences, high energy physics, and nuclear physics,  
2 through activities focused on—

3 “(1) Science for Discovery to unravel nature’s  
4 mysteries through activities which range from the  
5 study of subatomic particles, atoms, and molecules  
6 that make up the materials of our everyday world to  
7 the study of DNA, proteins, cells, and entire biological  
8 systems;

9 “(2) Science for National Need by—

10 “(A) advancing a clean energy agenda  
11 through research on energy production, storage,  
12 transmission, efficiency, and use; and

13 “(B) advancing our understanding of the  
14 Earth and its climate through research in atmospheric and environmental sciences and climate change; and

17 “(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 complex molecular systems and the nanoworld.

24 “(e) SUPPORTING ACTIVITIES.—The activities described in subsection (d) shall include providing for rel-

1 evant facilities and infrastructure, programmatic analysis,  
2 interagency coordination, and workforce development and  
3 outreach activities.

4 “(f) USER FACILITIES.—

5 “(1) IN GENERAL.—The Director shall carry  
6 out the construction, operation, and maintenance of  
7 user facilities, including underground research facili-  
8 ties, to support the activities described in subsection  
9 (d). As practicable, these facilities shall serve the  
10 needs of the Department, industry, the academic  
11 community, and other relevant entities for the pur-  
12 poses of advancing the missions of the Department.

13 “(2) COORDINATION WITH OTHER FEDERAL  
14 AGENCIES.—The Director may form partnerships to  
15 enhance the utilization of and ensure access to user  
16 facilities, including underground research facilities,  
17 by other Federal agencies.

18 “(3) UNDERGROUND RESEARCH FACILITIES RE-  
19 PORT.—Not later than 180 days after the date of  
20 enactment of this Act, the Director shall transmit to  
21 Congress a report describing the underground re-  
22 search priorities of the Department, taking into con-  
23 sideration previous reports by the High Energy  
24 Physics Advisory Panel, the National Research



1 Council, the Department of Energy, the National  
2 Science Foundation, and other appropriate entities.

3 “(g) OTHER AUTHORIZED ACTIVITIES.—In addition  
4 to the activities authorized under the Department of En-  
5 ergy Office of Science Authorization Act of 2014, the Of-  
6 fice of Science shall carry out other such activities as it  
7 is authorized or required to carry out by law.

8 “(h) COORDINATION AND JOINT ACTIVITIES WITH  
9 OTHER DEPARTMENT OF ENERGY PROGRAMS.—The  
10 Under Secretary shall ensure the coordination of activities  
11 under the Department of Energy Office of Science Author-  
12 ization Act of 2014 with the other activities of the Depart-  
13 ment, and shall support joint activities among the pro-  
14 grams of the Department.

15 “(i) DOMESTIC MANUFACTURING CAPABILITY FOR  
16 OFFICE OF SCIENCE FACILITIES REPORT.—Not later  
17 than one year after the date of enactment of the Depart-  
18 ment of Energy Office of Science Authorization Act of  
19 2014, the Secretary shall transmit a report to the Com-  
20 mittee on Science, Space, and Technology of the House  
21 of Representatives and the Committee on Energy and  
22 Natural Resources of the Senate. The report shall—

23 “(1) assess the current ability of domestic man-  
24 ufacturers to meet the procurement requirements for  
25 major ongoing projects funded by the Office of

1 Science, including a calculation of the percentage of  
2 equipment acquired from domestic manufacturers  
3 for this purpose; and

4 “(2) identify steps that can be taken by the  
5 Federal Government and by private industry to in-  
6 crease the capability of domestic manufacturers to  
7 meet procurement requirements of the Office of  
8 Science for major projects.”.

9 **SEC. 604. BASIC ENERGY SCIENCES PROGRAM.**

10 (a) PROGRAM.—As part of the activities authorized  
11 under the amendment made by section 603, the Director  
12 shall carry out a program in basic energy sciences, includ-  
13 ing materials sciences and engineering, chemical sciences,  
14 physical biosciences, and geosciences, for the purpose of  
15 providing the scientific foundations for new energy tech-  
16 nologies and addressing scientific grand challenges.

17 (b) BASIC ENERGY SCIENCES USER FACILITIES.—

18 (1) IN GENERAL.—The Director shall carry out  
19 a subprogram to support and oversee the construc-  
20 tion, operation, and maintenance of national user fa-  
21 cilities that support the program under this section.  
22 As practicable, these facilities shall serve the needs  
23 of the Department, industry, the academic commu-  
24 nity, and other relevant entities to create and exam-  
25 ine new materials and chemical processes for the

1 purposes of advancing new energy technologies and  
2 improving the competitiveness of the United States.

3 These facilities shall include—

4 (A) x-ray light sources;

5 (B) neutron sources;

6 (C) nanoscale science research centers; and

7 (D) other facilities the Director considers

8 appropriate, consistent with section 209(f) of

9 the Department of Energy Organization Act

10 (42 U.S.C. 7139(f)).

11 (2) FACILITY RESEARCH AND DEVELOPMENT.—

12 The Director shall carry out research and develop-

13 ment on advanced accelerator and storage ring tech-

14 nologies relevant to the Basic Energy Sciences user

15 facilities, in consultation with the Office of Science's

16 High Energy Physics and Nuclear Physics pro-

17 grams.

18 (3) FACILITY CONSTRUCTION AND UP-

19 GRADES.—Consistent with the Office of Science's

20 project management practices, the Director shall

21 support construction of—

22 (A) an upgrade of the Advanced Photon

23 Source to optimize and enhance beam bright-

24 ness;

1 (B) a Second Target Station at the Spall-  
2 ation Neutron Source to double user capacity  
3 and expand the suite of instruments to meet  
4 new scientific challenges;

5 (C) the Linac Coherent Light Source II to  
6 expand the x-ray wavelength range, incorporate  
7 high repetition rate operation for soft and me-  
8 dium energy x-rays, and increase user capacity  
9 of the Linac Coherent Light Source; and

10 (D) an upgrade to the Advanced Light  
11 Source to improve brightness and performance.

12 (c) ENERGY FRONTIER RESEARCH CENTERS.—

13 (1) IN GENERAL.—The Director shall carry out  
14 a program to provide awards, on a competitive,  
15 merit-reviewed basis, to multi-institutional collabora-  
16 tions or other appropriate entities to conduct funda-  
17 mental and use-inspired energy research to accel-  
18 erate scientific breakthroughs related to needs iden-  
19 tified in—

20 (A) the Grand Challenges report of the De-  
21 partment's Basic Energy Sciences Advisory  
22 Committee;

23 (B) the report of the Department's Basic  
24 Energy Sciences Advisory Committee entitled

1 “From Quanta to the Continuum: Opportuni-  
2 ties for Mesoscale Science”;

3 (C) the Basic Energy Sciences Basic Re-  
4 search Needs workshop report; or

5 (D) other relevant reports identified by the  
6 Director.

7 (2) COLLABORATIONS.—A collaboration receiv-  
8 ing an award under this subsection may include mul-  
9 tiple types of institutions and private sector entities.

10 (3) SELECTION AND DURATION.—

11 (A) IN GENERAL.—A collaboration under  
12 this subsection shall be selected for a period of  
13 5 years. An Energy Frontier Research Center  
14 already in existence and supported by the Di-  
15 rector on the date of enactment of this Act may  
16 continue to receive support for a period of 5  
17 years beginning on the date of establishment of  
18 that center.

19 (B) REAPPLICATION.—After the end of the  
20 period described in subparagraph (A), an  
21 awardee may reapply for selection for a second  
22 period of 5 years on a competitive, merit-re-  
23 viewed basis.

24 (C) TERMINATION.—Consistent with the  
25 existing authorities of the Department, the Di-

1 rector may terminate an underperforming cen-  
2 ter for cause during the performance period.

3 (4) NO FUNDING FOR CONSTRUCTION.—No  
4 funding provided pursuant to this subsection may be  
5 used for the construction of new buildings or facili-  
6 ties.

7 **SEC. 605. BIOLOGICAL AND ENVIRONMENTAL RESEARCH.**

8 (a) IN GENERAL.—As part of the activities author-  
9 ized under section 209 of the Department of Energy Orga-  
10 nization Act (42 U.S.C. 7139), and coordinated with the  
11 activities authorized under section 604 and section 606,  
12 the Director shall carry out a program of research and  
13 development in the areas of biological systems science and  
14 climate and environmental science, including subsurface  
15 science, to support the energy and environmental missions  
16 of the Department.

17 (b) BIOLOGICAL SYSTEMS SCIENCE ACTIVITIES.—

18 (1) ACTIVITIES.—As part of the activities au-  
19 thorized under subsection (a), the Director shall  
20 carry out research and development activities in fun-  
21 damental, structural, computational, and systems bi-  
22 ology to increase systems-level understanding of the  
23 complex biological systems, which shall include ac-  
24 tivities to—

1 (A) accelerate breakthroughs and new  
2 knowledge that will enable cost-effective sus-  
3 tainable production of—

4 (i) biomass-based liquid transpor-  
5 tation fuels;

6 (ii) bioenergy; and

7 (iii) biobased materials;

8 (B) improve understanding of the global  
9 carbon cycle, including processes for removing  
10 carbon dioxide from the atmosphere, through  
11 photosynthesis and other biological processes,  
12 for sequestration and storage; and

13 (C) understand the biological mechanisms  
14 used to transform, immobilize, or remove con-  
15 taminants from subsurface environments.

16 (2) BIOENERGY RESEARCH CENTERS.—

17 (A) IN GENERAL.—In carrying out activi-  
18 ties under paragraph (1), the Director shall  
19 support at least 3 bioenergy research centers to  
20 accelerate advanced research and development  
21 of biomass-based liquid transportation fuels,  
22 bioenergy, or biobased materials that are pro-  
23 duced from a variety of regionally diverse feed-  
24 stocks.

1 (B) SELECTION AND DURATION.—A center  
2 established under subparagraph (A) shall be se-  
3 lected on a competitive, merit-reviewed basis for  
4 a period of 5 years beginning on the date of es-  
5 tablishment of that center. A center already in  
6 existence on the date of enactment of this Act  
7 may continue to receive support for a period of  
8 5 years beginning on the date of establishment  
9 of that center.

10 (C) RENEWAL.—After the end of the pe-  
11 riod described in subparagraph (B), an awardee  
12 may apply for a second period of 5 years on a  
13 merit-reviewed basis.

14 (D) TERMINATION.—Consistent with the  
15 existing authorities of the Department, the Di-  
16 rector may terminate an underperforming cen-  
17 ter for cause during the performance period.

18 (3) LOW DOSE RADIATION RESEARCH PRO-  
19 GRAM.—

20 (A) IN GENERAL.—The Director shall  
21 carry out a research program on low dose radi-  
22 ation. The purpose of the program is to en-  
23 hance the scientific understanding of and re-  
24 duce uncertainties associated with the effects of



1 exposure to low dose radiation in order to in-  
2 form improved risk management methods.

3 (B) DEFINITION.—In this paragraph, the  
4 term “low dose radiation” means a radiation  
5 dose of less than 100 millisieverts.

6 (C) STUDY.—Not later than 60 days after  
7 the date of enactment of this Act, the Director  
8 shall enter into an agreement with the National  
9 Academies to conduct a study assessing the  
10 current status and development of a long-term  
11 strategy for low dose radiation research. The  
12 study shall be conducted in coordination with  
13 Federal agencies that perform ionizing radi-  
14 ation effects research.

15 (D) CONTENTS.—The study performed  
16 under subparagraph (C) shall—

17 (i) identify current scientific chal-  
18 lenges for understanding the long-term ef-  
19 fects of ionizing radiation;

20 (ii) assess the status of current low  
21 dose radiation research in the United  
22 States and internationally;

23 (iii) formulate overall scientific goals  
24 for the future of low-dose radiation re-  
25 search in the United States;

1 (iv) recommend a long-term strategic  
2 and prioritized research agenda to address  
3 scientific research goals for overcoming the  
4 identified scientific challenges in coordina-  
5 tion with other research efforts;

6 (v) define the essential components of  
7 a research program that would address  
8 this research agenda within the universities  
9 and the National Laboratories; and

10 (vi) assess the cost-benefit effective-  
11 ness of such a program.

12 (E) 5-YEAR RESEARCH PLAN.—Not later  
13 than 90 days after the completion of the assess-  
14 ment performed under subparagraph (C), the  
15 Secretary shall deliver to the Committee on  
16 Science, Space, and Technology of the House of  
17 Representatives and the Committee on Energy  
18 and Natural Resources of the Senate a five-year  
19 research plan that responds to the assessment's  
20 findings and recommendations and identifies  
21 and prioritizes research needs.

22 (4) REPEAL.—Section 977 of the Energy Policy  
23 Act of 2005 (42 U.S.C. 16317) is repealed.

24 (c) CLIMATE AND ENVIRONMENTAL SCIENCE ACTIVI-  
25 TIES.—

1           (1) IN GENERAL.—As part of the activities au-  
2           thorized under subsection (a), and in coordination  
3           with activities carried out under subsection (b), the  
4           Director shall carry out climate and environmental  
5           science research, which shall include activities to—

6                   (A) understand, observe, and model the re-  
7                   sponse of Earth’s atmosphere and biosphere to  
8                   increased concentrations of greenhouse gas  
9                   emissions and any associated changes in cli-  
10                  mate;

11                  (B) understand the processes for immo-  
12                  bilization, or removal of, and understand the  
13                  movement of, energy production-derived con-  
14                  taminants such as radionuclides and heavy met-  
15                  als, and understand the process of sequestration  
16                  and transformation of carbon dioxide in sub-  
17                  surface environments; and

18                  (C) inform potential mitigation and adap-  
19                  tation options for increased concentrations of  
20                  greenhouse gas emissions and any associated  
21                  changes in climate.

22           (2)   SUBSURFACE    BIOGEOCHEMICAL    RE-  
23           SEARCH.—

24                   (A) IN GENERAL.—As part of the activities  
25                  described in paragraph (1), the Director shall

1 carry out research to advance a fundamental  
2 understanding of coupled physical, chemical,  
3 and biological processes for controlling the  
4 movement of sequestered carbon and subsurface  
5 environmental contaminants.

6 (B) COORDINATION.—

7 (i) DIRECTOR.—The Director shall  
8 carry out activities under this paragraph in  
9 accordance with priorities established by  
10 the Under Secretary to support and accel-  
11 erate the decontamination of relevant fa-  
12 cilities managed by the Department.

13 (ii) UNDER SECRETARY.—The Under  
14 Secretary shall ensure the coordination of  
15 activities of the Department, including ac-  
16 tivities under this paragraph, to support  
17 and accelerate the decontamination of rel-  
18 evant facilities managed by the Depart-  
19 ment.

20 (3) CLIMATE AND EARTH MODELING.—As part  
21 of the activities described in paragraph (1), the Di-  
22 rector, in collaboration with the Advanced Scientific  
23 Computing Research program described in section  
24 606, shall carry out research to develop, evaluate,  
25 and use high-resolution regional climate, global cli-

1       mate, and Earth models to inform decisions on re-  
2       ducing the impacts of a changing climate. Such  
3       modeling shall include, among other critical ele-  
4       ments, greenhouse gas emissions, land use, and  
5       interaction among human and Earth systems.

6   **SEC. 606. ADVANCED SCIENTIFIC COMPUTING RESEARCH**  
7                   **PROGRAM.**

8       (a) IN GENERAL.—As part of the activities author-  
9       ized under section 209 of the Department of Energy Orga-  
10      nization Act (42 U.S.C. 7139), the Director shall carry  
11      out a research, development, demonstration, and commer-  
12      cial application program to advance computational and  
13      networking capabilities for data-driven discovery and to  
14      analyze, model, simulate, and predict complex phenomena  
15      relevant to the development of new energy technologies  
16      and the competitiveness of the United States.

17      (b) COORDINATION.—The Under Secretary shall en-  
18      sure the coordination of the activities of the Department,  
19      including activities under this section, to determine and  
20      meet the computational and networking research and fa-  
21      cility needs of the Office of Science and all other relevant  
22      energy technology and energy efficiency programs within  
23      the Department.

24      (c) RESEARCH TO SUPPORT ENERGY APPLICA-  
25      TIONS.—

1           (1) IN GENERAL.—As part of the activities au-  
2           thorized under subsection (a), the program shall  
3           support research in high-performance computing and  
4           networking relevant to energy applications including  
5           modeling, simulation, and advanced data analytics  
6           for basic and applied energy research programs car-  
7           ried out by the Secretary.

8           (2) REPORT.—Not later than 1 year after the  
9           date of enactment of this Act, the Secretary shall  
10          transmit to the Congress a plan to integrate and le-  
11          verage the expertise and capabilities of the program  
12          described in subsection (a), as well as other relevant  
13          computational and networking research programs  
14          and resources supported by the Federal Government,  
15          to advance the missions of the Department’s applied  
16          energy and energy efficiency programs.

17          (d) APPLIED MATHEMATICS AND SOFTWARE DEVEL-  
18          OPMENT FOR HIGH-END COMPUTING SYSTEMS.—The Di-  
19          rector shall carry out activities to develop, test, and sup-  
20          port mathematics, models, and algorithms for complex  
21          systems, as well as programming environments, tools, lan-  
22          guages, and operating systems for high-end computing  
23          systems (as defined in section 2 of the Department of En-  
24          ergy High-End Computing Revitalization Act of 2004 (15  
25          U.S.C. 5541)).

1       (e) EXASCALE COMPUTING PROGRAM.—Section 3 of  
2 the Department of Energy High-End Computing Revital-  
3 ization Act of 2004 (15 U.S.C. 5542) is amended—

4           (1) in subsection (a)—

5               (A) in paragraph (1), by striking “pro-  
6 gram” and inserting “coordinated program  
7 across the Department”;

8               (B) by striking “and” at the end of para-  
9 graph (1);

10              (C) by striking the period at the end of  
11 paragraph (2) and inserting “; and”; and

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

14           “(3) partner with universities, National Labora-  
15 tories, and industry to ensure the broadest possible  
16 application of the technology developed in this pro-  
17 gram to other challenges in science, engineering,  
18 medicine, and industry.”;

19           (2) in subsection (b)(2), by striking “vector”  
20 and all that follows through “architectures” and in-  
21 serting “computer technologies that show promise of  
22 substantial reductions in power requirements and  
23 substantial gains in parallelism of multicore proc-  
24 essors, concurrency, memory and storage, band-  
25 width, and reliability”; and

1           (3) by striking subsection (d) and inserting the  
2 following:

3           “(d) EXASCALE COMPUTING PROGRAM.—

4           “(1) IN GENERAL.—The Secretary shall con-  
5 duct a coordinated research program to develop  
6 exascale computing systems to advance the missions  
7 of the Department.

8           “(2) EXECUTION.—The Secretary shall,  
9 through competitive merit review, establish two or  
10 more National Laboratory-industry-university part-  
11 nerships to conduct integrated research, develop-  
12 ment, and engineering of multiple exascale architec-  
13 tures, and—

14           “(A) conduct mission-related co-design ac-  
15 tivities in developing such exascale platforms;

16           “(B) develop those advancements in hard-  
17 ware and software technology required to fully  
18 realize the potential of an exascale production  
19 system in addressing Department target appli-  
20 cations and solving scientific problems involving  
21 predictive modeling and simulation and large-  
22 scale data analytics and management; and

23           “(C) explore the use of exascale computing  
24 technologies to advance a broad range of  
25 science and engineering.



1           “(3) ADMINISTRATION.—In carrying out this  
2       program, the Secretary shall—

3           “(A) provide, on a competitive, merit-re-  
4       viewed basis, access for researchers in United  
5       States industry, institutions of higher edu-  
6       cation, National Laboratories, and other Fed-  
7       eral agencies to these exascale systems, as ap-  
8       propriate; and

9           “(B) conduct outreach programs to in-  
10      crease the readiness for the use of such plat-  
11      forms by domestic industries, including manu-  
12      facturers.

13       “(4) REPORTS.—

14           “(A) INTEGRATED STRATEGY AND PRO-  
15      GRAM MANAGEMENT PLAN.—The Secretary  
16      shall submit to Congress, not later than 90  
17      days after the date of enactment of the Depart-  
18      ment of Energy Office of Science Authorization  
19      Act of 2014, a report outlining an integrated  
20      strategy and program management plan, in-  
21      cluding target dates for prototypical and pro-  
22      duction exascale platforms, interim milestones  
23      to reaching these targets, functional require-  
24      ments, roles and responsibilities of National  
25      Laboratories and industry, acquisition strategy,

1 and estimated resources required, to achieve  
2 this exascale system capability. The report shall  
3 include the Secretary's plan for Departmental  
4 organization to manage and execute the  
5 Exascale Computing Program, including defini-  
6 tion of the roles and responsibilities within the  
7 Department to ensure an integrated program  
8 across the Department. The report shall also  
9 include a plan for ensuring balance and  
10 prioritizing across ASCR subprograms in a flat  
11 or slow-growth budget environment.

12 “(B) STATUS REPORTS.—At the time of  
13 the budget submission of the Department for  
14 each fiscal year, the Secretary shall submit a  
15 report to Congress that describes the status of  
16 milestones and costs in achieving the objectives  
17 of the exascale computing program.

18 “(C) EXASCALE MERIT REPORT.—At least  
19 18 months prior to the initiation of construction  
20 or installation of any exascale-class computing  
21 facility, the Secretary shall transmit a plan to  
22 the Congress detailing—

23 “(i) the proposed facility's cost projec-  
24 tions and capabilities to significantly accel-

1           erate the development of new energy tech-  
2           nologies;

3           “(ii) technical risks and challenges  
4           that must be overcome to achieve success-  
5           ful completion and operation of the facility;  
6           and

7           “(iii) an independent assessment of  
8           the scientific and technological advances  
9           expected from such a facility relative to  
10          those expected from a comparable invest-  
11          ment in expanded research and applica-  
12          tions at terascale-class and petascale-class  
13          computing facilities, including an evalua-  
14          tion of where investments should be made  
15          in the system software and algorithms to  
16          enable these advances.”.

17          (f) DEFINITIONS.—Section 2 of the Department of  
18          Energy High-End Computing Revitalization Act of 2004  
19          (15 U.S.C. 5541) is amended by striking paragraphs (1)  
20          through (5) and inserting the following:

21                 “(1) CO-DESIGN.—The term ‘co-design’ means  
22                 the joint development of application algorithms,  
23                 models, and codes with computer technology archi-  
24                 tectures and operating systems to maximize effective  
25                 use of high-end computing systems.

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

3           “(3) EXASCALE.—The term ‘exascale’ means  
4 computing system performance at or near 10 to the  
5 18th power floating point operations per second.

6           “(4) HIGH-END COMPUTING SYSTEM.—The  
7 term ‘high-end computing system’ means a com-  
8 puting system with performance that substantially  
9 exceeds that of systems that are commonly available  
10 for advanced scientific and engineering applications.

11          “(5) LEADERSHIP SYSTEM.—The term ‘Leader-  
12 ship System’ means a high-end computing system  
13 that is among the most advanced in the world in  
14 terms of performance in solving scientific and engi-  
15 neering problems.

16          “(6) INSTITUTION OF HIGHER EDUCATION.—  
17 The term ‘institution of higher education’ has the  
18 meaning given the term in section 2 of the Energy  
19 Policy Act of 2005 (42 U.S.C. 15801).

20          “(7) NATIONAL LABORATORY.—The term ‘Na-  
21 tional Laboratory’ has the meaning given the term  
22 in section 2 of the Energy Policy Act of 2005 (42  
23 U.S.C. 15801).

24          “(8) SECRETARY.—The term ‘Secretary’ means  
25 the Secretary of Energy.

1           “(9) SOFTWARE TECHNOLOGY.—The term  
2       ‘software technology’ includes optimal algorithms,  
3       programming environments, tools, languages, and  
4       operating systems for high-end computing systems.”.

5 **SEC. 607. FUSION ENERGY RESEARCH.**

6       (a) PROGRAM.—As part of the activities authorized  
7       under section 209 of the Department of Energy Organiza-  
8       tion Act (42 U.S.C. 7139) and section 972 of the Energy  
9       Policy Act of 2005 (42 U.S.C. 16312), the Director shall  
10      carry out a fusion energy sciences research and enabling  
11      technology development program to effectively address the  
12      scientific and engineering challenges to building a cost-  
13      competitive fusion power plant and a competitive fusion  
14      power industry in the United States. As part of this pro-  
15      gram, the Director shall carry out research activities to  
16      expand the fundamental understandings of plasmas and  
17      matter at very high temperatures and densities.

18      (b) ITER.—The Director shall coordinate and carry  
19      out the responsibilities of the United States with respect  
20      to the ITER international fusion project pursuant to the  
21      Agreement on the Establishment of the International Fu-  
22      sion Energy Organization for the Joint Implementation of  
23      the ITER Project.

24      (c) IDENTIFICATION OF PRIORITIES.—

1           (1) REPORT.—Not later than 18 months after  
2           the date of enactment of this Act, the Secretary  
3           shall transmit to the Congress a report on the De-  
4           partment’s proposed research and development ac-  
5           tivities in magnetic fusion over the 10 years fol-  
6           lowing the date of enactment of this Act under at  
7           least three realistic budget scenarios. The report  
8           shall—

9                   (A) identify specific areas of fusion energy  
10           research enabling technology development in  
11           which the United States can and should estab-  
12           lish or solidify a lead in the global fusion energy  
13           development effort; and

14                   (B) identify priorities for initiation of facil-  
15           ity construction and facility decommissioning  
16           under each of those scenarios.

17           (2) REVIEW.—The report shall be reviewed by  
18           the Fusion Energy Sciences Advisory Committee  
19           prior to its transmittal to Congress. The Secretary  
20           shall provide the Fusion Energy Sciences Advisory  
21           Committee with the opportunity and sufficient re-  
22           sources to submit its own recommendations and ad-  
23           ditional views on the Department’s final report to  
24           Congress.

1       (d) FUSION MATERIALS RESEARCH AND DEVELOP-  
2     MENT.—As part of the activities authorized in section 978  
3     of the Energy Policy Act of 2005 (42 U.S.C. 16318), the  
4     Director, in coordination with the Assistant Secretary for  
5     Nuclear Energy of the Department, shall carry out re-  
6     search and development activities to identify, characterize,  
7     and create materials that can endure the neutron, plasma,  
8     and heat fluxes expected in a commercial fusion power  
9     plant. As part of the activities authorized under subsection  
10    (c), the Secretary shall—

11           (1) provide an assessment of the need for a fa-  
12           cility or facilities that can examine and test potential  
13           fusion and next generation fission materials and  
14           other enabling technologies relevant to the develop-  
15           ment of commercial fusion power plants; and

16           (2) provide an assessment of whether a single  
17           new facility that substantially addresses magnetic  
18           fusion, inertial fusion, and next generation fission  
19           materials research needs is feasible, in conjunction  
20           with the expected capabilities of facilities operational  
21           as of the date of enactment of this Act.

22       (e) INERTIAL FUSION ENERGY RESEARCH AND DE-  
23     VELOPMENT PROGRAM.—The Secretary shall carry out a  
24     program of research and technology development in iner-

1 tial fusion for energy applications, including ion beam,  
2 laser, and pulsed power fusion systems.

3 **SEC. 608. HIGH ENERGY PHYSICS PROGRAM.**

4 (a) IN GENERAL.—As part of the activities author-  
5 ized under section 209 of the Department of Energy Orga-  
6 nization Act (42 U.S.C. 7139), the Director shall carry  
7 out a research program on the elementary constituents of  
8 matter and energy and the nature of space and time.

9 (b) ENERGY FRONTIER RESEARCH.—As part of the  
10 program described in subsection (a), the Director shall  
11 carry out research using high energy accelerators and ad-  
12 vanced detectors to create and study interactions of novel  
13 particles and investigate fundamental forces.

14 (c) NEUTRINO RESEARCH.—As part of the program  
15 described in subsection (a), the Director shall carry out  
16 research activities on rare decay processes and the nature  
17 of the neutrino, which may—

18 (1) include collaborations with the National  
19 Science Foundation or international collaborations  
20 on relevant research projects; and

21 (2) utilize components of existing accelerator  
22 facilities to produce neutrino beams of sufficient in-  
23 tensity to explore research priorities identified by the  
24 High Energy Physics Advisory Panel or the National  
25 Academy of Sciences.



1       (d) DARK ENERGY AND DARK MATTER RE-  
2 SEARCH.—As part of the program described in subsection  
3 (a), the Director shall carry out research activities on the  
4 nature of dark energy and dark matter. These activities  
5 shall be consistent with the research priorities identified  
6 by the High Energy Physics Advisory Panel or the Na-  
7 tional Academy of Sciences, and may include—

8           (1) collaborations with the National Aeronautics  
9       and Space Administration, the National Science  
10      Foundation, or international collaborations on rel-  
11      evant research projects; and

12           (2) the development of space-based, land-based,  
13      and underground facilities and experiments.

14       (e) ACCELERATOR RESEARCH AND DEVELOP-  
15 MENT.—As part of the program described in subsection  
16 (a), the Director shall carry out research and development  
17 in advanced accelerator concepts and technologies, includ-  
18 ing laser technologies, to reduce the necessary scope and  
19 cost for the next generation of particle accelerators, in co-  
20 ordination with the Office of Science’s Basic Energy  
21 Sciences and Nuclear Physics programs.

22       (f) INTERNATIONAL COLLABORATION.—The Direc-  
23 tor, as practicable and in coordination with other appro-  
24 priate Federal agencies as necessary, shall ensure the ac-  
25 cess of United States researchers to the most advanced

1 accelerator facilities and research capabilities in the world,  
2 including the Large Hadron Collider.

3 **SEC. 609. NUCLEAR PHYSICS PROGRAM.**

4 (a) PROGRAM.—As part of the activities authorized  
5 under section 209 of the Department of Energy Organiza-  
6 tion Act (42 U.S.C. 7139), the Director shall carry out  
7 a research program, and support relevant facilities, to dis-  
8 cover and understand various forms of nuclear matter.

9 (b) FACILITY CONSTRUCTION.—

10 (1) IN GENERAL.—Consistent with the Office of  
11 Science’s project management practices, the Director  
12 shall continue to support the construction of the Fa-  
13 cility for Rare Isotope Beams.

14 (2) REPEAL.—Section 981 of the Energy Policy  
15 Act of 2005 (42 U.S.C. 16321) is repealed.

16 (c) ISOTOPE DEVELOPMENT AND PRODUCTION FOR  
17 RESEARCH APPLICATIONS.—

18 (1) IN GENERAL.—The Director shall carry out  
19 a program for the production of isotopes that the  
20 Director determines are needed for research and ap-  
21 plications, including—

22 (A) the development of techniques to  
23 produce isotopes; and

24 (B) support for infrastructure required for  
25 isotope research and production.

1           (2) COORDINATION.—In making the determina-  
2       tion described in paragraph (1), the Secretary  
3       shall—

4           (A) ensure that isotope production activi-  
5       ties do not compete with private industry unless  
6       critical national interests necessitate the Fed-  
7       eral Government’s involvement; and

8           (B) consider any relevant recommendations  
9       made by Federal advisory committees, the Na-  
10      tional Academies, and interagency working  
11      groups in which the Department participates.

12 **SEC. 610. SCIENCE LABORATORIES INFRASTRUCTURE PRO-**  
13 **GRAM.**

14       (a) PROGRAM.—The Director shall carry out a pro-  
15      gram to improve the safety, efficiency, and mission readi-  
16      ness of infrastructure at Office of Science laboratories.  
17      The program shall include projects to—

18           (1) renovate or replace space that does not  
19      meet research needs;

20           (2) replace facilities that are no longer cost ef-  
21      fective to renovate or operate;

22           (3) modernize utility systems to prevent failures  
23      and ensure efficiency;

24           (4) remove excess facilities to allow safe and ef-  
25      ficient operations; and

1           (5) construct modern facilities to conduct ad-  
2       vanced research in controlled environmental condi-  
3       tions.

4       (b) APPROACH.—In carrying out this section, the Di-  
5       rector shall utilize all available approaches and mecha-  
6       nisms, including capital line items, minor construction  
7       projects, energy savings performance contracts, utility en-  
8       ergy service contracts, alternative financing, and expense  
9       funding, as appropriate.

10       (c) DEFINITION.—The term “Office of Science lab-  
11       oratory” means a subset of National Laboratories as de-  
12       fined in section 2(3) of the Energy Policy Act of 2005  
13       (42 U.S.C. 15801) consisting of subparagraphs (A), (B),  
14       (C), (D), (F), (K), (L), (M), (P), and (Q).

15       **SEC. 611. AUTHORIZATION OF APPROPRIATIONS.**

16       There are authorized to be appropriated to the Sec-  
17       retary for the activities of the Office of Science—

18           (1) \$5,324,550,000 for fiscal year 2015;

19           (2) \$5,590,777,500 for fiscal year 2016;

20           (3) \$5,870,316,375 for fiscal year 2017;

21           (4) \$6,163,832,194 for fiscal year 2018; and

22           (5) \$6,472,023,803 for fiscal year 2019.

1                   **Subtitle B—ARPA-E**

2   **SEC. 621. SHORT TITLE.**

3           This subtitle may be cited as the “ARPA-E Reau-  
4   thorization Act of 2014”.

5   **SEC. 622. ARPA-E AMENDMENTS.**

6           Section 5012 of the America COMPETES Act (42  
7   U.S.C. 16538) is amended—

8                   (1) by redesignating subsection (n) as sub-  
9           section (o) and inserting after subsection (m) the  
10          following new subsection:

11          “(n) PROTECTION OF PROPRIETARY INFORMA-  
12   TION.—The following categories of information collected  
13   by the Advanced Research Projects Agency-Energy from  
14   recipients of financial assistance awards shall be consid-  
15   ered privileged and confidential and not subject to disclo-  
16   sure pursuant to section 552 of title 5, United States  
17   Code:

18                   “(1) Plans for commercialization of technologies  
19          developed under the award, including business plans,  
20          technology to market plans, market studies, and cost  
21          and performance models.

22                   “(2) Investments provided to an awardee from  
23          third parties, such as venture capital, hedge fund, or  
24          private equity firms, including amounts and percent-

age of ownership of the awardee provided in return for such investments.

“(3) Additional financial support that the awardee plans to invest or has invested into the technology developed under the award, or that the awardee is seeking from third parties.

“(4) Revenue from the licensing or sale of new products or services resulting from the research conducted under the award.”; and

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

(A) striking “and” at the end of subparagraph (D);

(B) striking the period at the end of subparagraph (E) and inserting a semicolon; and

(C) adding at the end the following:

“(F) \$325,000,000 for fiscal year 2015;

“(G) \$341,250,000 for fiscal year 2016;

“(H) \$358,312,500 for fiscal year 2017;

“(I) \$376,228,125 for fiscal year 2018;

and

“(J) \$395,039,531 for fiscal year 2019.”.

## **Subtitle C—Energy Innovation**

### **SEC. 641. ENERGY INNOVATION HUBS.**

(a) AUTHORIZATION OF PROGRAM.—

1           (1) IN GENERAL.—The Secretary of Energy  
2       shall carry out a program to enhance the Nation’s  
3       economic, environmental, and energy security by  
4       making awards to consortia for establishing and op-  
5       erating Energy Innovation Hubs to conduct and  
6       support, whenever practicable at one centralized lo-  
7       cation, multidisciplinary, collaborative research, de-  
8       velopment, demonstration, and commercial applica-  
9       tion of advanced energy technologies.

10          (2) TECHNOLOGY DEVELOPMENT FOCUS.—The  
11       Secretary shall designate for each Hub a unique ad-  
12       vanced energy technology focus.

13          (3) COORDINATION.—The Secretary shall en-  
14       sure the coordination of, and avoid unnecessary du-  
15       plication of, the activities of Hubs with those of  
16       other Department of Energy research entities, in-  
17       cluding the National Laboratories, the Advanced Re-  
18       search Projects Agency-Energy, Energy Frontier Re-  
19       search Centers, and within industry.

20       (b) CONSORTIA.—

21           (1) ELIGIBILITY.—To be eligible to receive an  
22       award under this section for the establishment and  
23       operation of a Hub, a consortium shall—

24                (A) be composed of no fewer than 2 quali-  
25       fying entities; and

1 (B) operate subject to an agreement en-  
2 tered into by its members that documents—

3 (i) the proposed partnership agree-  
4 ment, including the governance and man-  
5 agement structure of the Hub;

6 (ii) measures to enable cost-effective  
7 implementation of the program under this  
8 section;

9 (iii) a proposed budget, including fi-  
10 nancial contributions from non-Federal  
11 sources;

12 (iv) a plan for managing intellectual  
13 property rights; and

14 (v) an accounting structure that en-  
15 ables the Secretary to ensure that the con-  
16 sortium has complied with the require-  
17 ments of this section.

18 (2) APPLICATION.—A consortium seeking to es-  
19 tablish and operate a Hub under this section, acting  
20 through a prime applicant, shall transmit to the Sec-  
21 retary an application at such time, in such form,  
22 and accompanied by such information as the Sec-  
23 retary shall require, including a detailed description  
24 of the elements of the consortium agreement re-  
25 quired under paragraph (1)(B). If the consortium



1 members will not be located at one centralized loca-  
2 tion, such application shall include a communica-  
3 tions plan that ensures close coordination and inte-  
4 gration of the Hub's activities.

5 (c) SELECTION AND SCHEDULE.—The Secretary  
6 shall select consortia for awards for the establishment and  
7 operation of Hubs through competitive selection processes.  
8 In selecting consortia, the Secretary shall consider the in-  
9 formation a consortium must disclose according to sub-  
10 section (b), as well as any existing facilities a consortium  
11 will provide for Hub activities. Awards made to a Hub  
12 shall be for a period not to exceed 5 years, after which  
13 the award may be renewed, subject to a rigorous merit  
14 review. A Hub already in existence on the date of enact-  
15 ment of this Act may continue to receive support for a  
16 period of 5 years beginning on the date of establishment  
17 of that Hub.

18 (d) HUB OPERATIONS.—

19 (1) IN GENERAL.—Each Hub shall conduct or  
20 provide for multidisciplinary, collaborative research,  
21 development, demonstration, and, where appropriate,  
22 commercial application of advanced energy tech-  
23 nologies within the technology development focus  
24 designated under subsection (a)(2). Each Hub  
25 shall—

1           (A) encourage collaboration and commu-  
2           nication among the member qualifying entities  
3           of the consortium and awardees by conducting  
4           activities whenever practicable at one central-  
5           ized location;

6           (B) develop and publish on the Depart-  
7           ment of Energy's website proposed plans and  
8           programs;

9           (C) submit an annual report to the Sec-  
10          retary summarizing the Hub's activities, includ-  
11          ing detailing organizational expenditures, and  
12          describing each project undertaken by the Hub;  
13          and

14          (D) monitor project implementation and  
15          coordination.

16       (2) CONFLICTS OF INTEREST.—

17           (A) PROCEDURES.—Hubs shall maintain  
18           conflict of interest procedures, consistent with  
19           those of the Department of Energy, to ensure  
20           that employees and consortia designees for Hub  
21           activities who are in decisionmaking capacities  
22           disclose all material conflicts of interest.

23           (B) DISQUALIFICATION AND REVOCATION.—The Secretary may disqualify an appli-  
24           cation or revoke funds distributed to a Hub if  
25

1 the Secretary discovers a failure to comply with  
2 conflict of interest procedures established under  
3 subparagraph (A).

4 (3) PROHIBITION ON CONSTRUCTION.—

5 (A) IN GENERAL.—No funds provided pur-  
6 suant to this section may be used for construc-  
7 tion of new buildings or facilities for Hubs.  
8 Construction of new buildings or facilities shall  
9 not be considered as part of the non-Federal  
10 share of a Hub cost-sharing agreement.

11 (B) TEST BED AND RENOVATION EXCEP-  
12 TION.—Nothing in this subsection shall prohibit  
13 the use of funds provided pursuant to this sec-  
14 tion, or non-Federal cost share funds, for re-  
15 search or for the construction of a test bed or  
16 renovations to existing buildings or facilities for  
17 the purposes of research if the Secretary deter-  
18 mines that the test bed or renovations are lim-  
19 ited to a scope and scale necessary for the re-  
20 search to be conducted.

21 (e) TERMINATION.—Consistent with the existing au-  
22 thorities of the Department, the Secretary may terminate  
23 an underperforming Hub for cause during the perform-  
24 ance period.

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

1           (1) ADVANCED ENERGY TECHNOLOGY.—The  
2       term “advanced energy technology” means—

3           (A) an innovative technology—

4               (i) that produces energy from solar,  
5               wind, geothermal, biomass, tidal, wave,  
6               ocean, or other renewable energy resources;

7               (ii) that produces nuclear energy;

8               (iii) for carbon capture and sequestra-  
9               tion;

10              (iv) that enables advanced vehicles,  
11              vehicle components, and related tech-  
12              nologies that result in significant energy  
13              savings;

14              (v) that generates, transmits, distrib-  
15              utes, utilizes, or stores energy more effi-  
16              ciently than conventional technologies, in-  
17              cluding through Smart Grid technologies;  
18              or

19              (vi) that enhances the energy inde-  
20              pendence and security of the United States  
21              by enabling improved or expanded supply  
22              and production of domestic energy re-  
23              sources, including coal, oil, and natural  
24              gas;

1 (B) research, development, demonstration,  
2 and commercial application activities necessary  
3 to ensure the long-term, secure, and sustainable  
4 supply of energy critical elements; or

5 (C) another innovative energy technology  
6 area identified by the Secretary.

7 (2) ENERGY CRITICAL ELEMENT.—The term  
8 “energy critical element” means any of a class of  
9 chemical elements that have a high risk of a supply  
10 disruption and are critical to one or more new, en-  
11 ergy-related technologies such that a shortage of  
12 such element would significantly inhibit large-scale  
13 deployment of technologies that produce, transmit,  
14 store, or conserve energy.

15 (3) HUB.—The term “Hub” means an Energy  
16 Innovation Hub established or operating in accord-  
17 ance with this section, including any Energy Innova-  
18 tion Hub existing as of the date of enactment of this  
19 Act.

20 (4) QUALIFYING ENTITY.—The term “quali-  
21 fying entity” means—

22 (A) an institution of higher education;

23 (B) an appropriate State or Federal entity,  
24 including the Department of Energy Federally  
25 Funded Research and Development Centers;

1 (C) a nongovernmental organization with  
2 expertise in advanced energy technology re-  
3 search, development, demonstration, or com-  
4 mercial application; or

5 (D) any other relevant entity the Secretary  
6 considers appropriate.

7 **SEC. 642. PARTICIPATION IN THE INNOVATION CORPS PRO-**  
8 **GRAM.**

9 (a) AGREEMENT.—The Secretary of Energy shall  
10 enter into an agreement with the Director of the National  
11 Science Foundation to enable researchers funded by the  
12 Department of Energy to participate in the Innovation  
13 Corps program authorized by section 307.

14 (b) AUTHORIZATION.—The Secretary of Energy may  
15 also establish a Department of Energy Innovation Corps  
16 program, modeled after the National Science Foundation  
17 Innovation Corps program, to incorporate experts from  
18 the Department of Energy National Laboratories in the  
19 training curriculum of the program.

20 **SEC. 643. TECHNOLOGY TRANSFER.**

21 (a) REPORT.—Not later than 180 days after the date  
22 of enactment of this Act, the Secretary shall transmit to  
23 the Committee on Science, Space, and Technology of the  
24 House of Representatives and the Committee on Energy

1 and Natural Resources of the Senate a report which shall  
2 include—

3 (1) an assessment of the Department’s current  
4 ability to carry out the goals of section 1001 of the  
5 Energy Policy Act of 2005 (42 U.S.C. 16391), in-  
6 cluding an assessment of the role and effectiveness  
7 of the Technology Transfer Coordinator position;  
8 and

9 (2) recommended departmental policy changes  
10 and legislative changes to section 1001 of the En-  
11 ergy Policy Act of 2005 (42 U.S.C. 16391) to im-  
12 prove the Department’s ability to successfully trans-  
13 fer new energy technologies to the private sector.

14 (b) AMENDMENTS.—Section 1001 of the Energy Pol-  
15 icy Act of 2005 (42 U.S.C. 16391) is amended—

16 (1) by redesignating subsections (f) and (g) as  
17 subsections (h) and (i), respectively; and

18 (2) by inserting after subsection (e) the fol-  
19 lowing new subsections:

20 “(f) AGREEMENTS FOR COMMERCIALIZING TECH-  
21 NOLOGY.—

22 “(1) IN GENERAL.—The Secretary may permit  
23 the directors of the National Laboratories to exercise  
24 Agreements for Commercializing Technology author-  
25 ity and execute agreements with non-Federal entities

1 to sponsor research and development activities at the  
2 National Laboratories.

3 “(2) ELIGIBILITY.—When exercising the au-  
4 thority authorized by this subsection, the Secretary  
5 shall permit the directors of the National Labora-  
6 tories to execute agreements with non-Federal enti-  
7 ties, including non-Federal entities that have re-  
8 ceived Federal funding, provided that the non-Fed-  
9 eral entity uses no funds derived from a current  
10 Federal contract or award to carry out such an  
11 agreement.

12 “(3) CONTINUATION OF AUTHORITY.—The Sec-  
13 retary shall continue to provide Agreements for  
14 Commercializing Technology authority for at least 2  
15 years after the date of enactment of this Act.

16 “(4) REPORT.—Upon completion of the Agree-  
17 ments for Commercializing Technology pilot pro-  
18 gram, the Secretary shall submit a report to the  
19 Committee on Science, Space, and Technology of the  
20 House of Representatives and the Committee on En-  
21 ergy and Natural Resources of the Senate that in-  
22 cludes the results of the pilot program and explains  
23 the Department’s decision whether or not to con-  
24 tinue permitting the directors of the National Lab-



1 oratories to exercise Agreements for Commer-  
2 cializing Technology authority.

3 “(g) INCLUSION OF TECHNOLOGY MATURATION IN  
4 AUTHORIZED TECHNOLOGY TRANSFER ACTIVITIES.—The  
5 Secretary shall permit the directors of the National Lab-  
6 oratories to use funds authorized to support technology  
7 transfer, following the standard practices of the Depart-  
8 ment, to carry out technology maturation activities to  
9 identify and improve potential commercial application op-  
10 portunities and demonstrate applications of research and  
11 technologies arising from National Laboratory activities.”.

12 (c) DELEGATION OF AUTHORITY FOR TECHNOLOGY  
13 TRANSFER AGREEMENTS.—

14 (1) AUTHORITY.—The Secretary of Energy  
15 shall delegate to directors of the National Labora-  
16 tories signature authority for any technology trans-  
17 fer agreement with a total cost of not more than  
18 \$500,000, including both National Laboratory con-  
19 tributions and the project recipient cost share con-  
20 tribution, if such an agreement falls within the scope  
21 of a strategic plan for the National Laboratory that  
22 has been approved by the Department.

23 (2) AGREEMENTS INCLUDED.—The agreements  
24 to which this subsection applies include—

1 (A) Cooperative Research and Develop-  
2 ment Agreements; and

3 (B) non-Federal Work for Others Agree-  
4 ments.

5 **SEC. 644. ELIMINATION OF COST SHARING REQUIREMENT**  
6 **FOR RESEARCH AND DEVELOPMENT ACTIVI-**  
7 **TIES CONDUCTED BY UNIVERSITIES AND**  
8 **NONPROFIT INSTITUTIONS.**

9 Section 988(b) of the Energy Policy Act of 2005 (42  
10 U.S.C. 16352(b)) is amended—

11 (1) in paragraph (1), by striking “Except as  
12 provided in paragraphs (2) and (3)” and inserting  
13 “Except as provided in paragraphs (2), (3) and  
14 (4)”; and

15 (2) by adding at the end the following new  
16 paragraph:

17 “(4) EXEMPTIONS.—

18 “(A) IN GENERAL.—Paragraph (1) shall  
19 not apply to a research or development activity  
20 performed by universities and other nonprofit  
21 institutions.

22 “(B) DEFINITION.—In this paragraph, the  
23 term ‘nonprofit institution’ has the meaning  
24 given that term in section 4(3) of the Steven-

1 son-Wydlar Technology Innovation Act of 1980  
2 (15 U.S.C. 3703(3)).”.

3 **SEC. 645. PILOT RACE TO THE TOP FOR ENERGY EFFI-**  
4 **CENCY AND GRID MODERNIZATION PRO-**  
5 **GRAM.**

6 The Secretary of Energy shall carry out a pilot pro-  
7 gram to promote innovative technologies and practices at  
8 the State, local, or tribal level or by electric cooperatives  
9 to increase energy efficiency, increase distributed elec-  
10 tricity generation, and modernize the grid. The Depart-  
11 ment shall provide—

12 (1) informational resources as appropriate to  
13 potential applicants; and

14 (2) technical assistance awards to carry out  
15 these activities on a competitive merit-reviewed  
16 basis.

17 **SEC. 646. RENAME UNDER SECRETARY FOR SCIENCE TO**  
18 **UNDER SECRETARY FOR SCIENCE AND EN-**  
19 **ERGY.**

20 Section 202 of the Department of Energy Organiza-  
21 tion Act (42 U.S.C. 7132) is amended by striking “Under  
22 Secretary for Science” each place it appears and inserting  
23 “Under Secretary for Science and Energy”.

1 **SEC. 647. SPECIAL HIRING AUTHORITY FOR SCIENTIFIC,**  
2 **ENGINEERING, AND PROJECT MANAGEMENT**  
3 **PERSONNEL.**

4 (a) IN GENERAL.—The Under Secretary shall have  
5 the authority to—

6 (1) make appointments of scientific, engineer-  
7 ing, and professional personnel, without regard to  
8 civil service laws, to assist the Department in meet-  
9 ing specific project or research needs;

10 (2) fix the basic pay of any employee appointed  
11 under this section at a rate to be determined by the  
12 Under Secretary at rates not in excess of the Execu-  
13 tive Schedule (EX–II) without regard to the civil  
14 service laws; and

15 (3) pay any employee appointed under this sec-  
16 tion payments in addition to basic pay, except that  
17 the total amount of additional payments paid to an  
18 employee under this subsection for any 12-month pe-  
19 riod shall not exceed the least of the following  
20 amounts:

21 (A) \$25,000.

22 (B) The amount equal to 25 percent of the  
23 annual rate of basic pay of that employee.

24 (C) The amount of the limitation that is  
25 applicable for a calendar year under section  
26 5307(a)(1) of title 5, United States Code.

1 (b) TERM.—

2 (1) IN GENERAL.—The term of any employee  
3 appointed under this section shall not exceed 3  
4 years.

5 (2) TERMINATION.—The Under Secretary shall  
6 have the authority to terminate any employee ap-  
7 pointed under this section at any time based on per-  
8 formance or changing project or research needs of  
9 the Department.

○