

**AMENDMENT IN THE NATURE OF A SUBSTITUTE
TO H.R. 1806
OFFERED BY Ms. EDDIE BERNICE JOHNSON OF
TEXAS**

Strike all after the enacting clause and insert the following:

1 SECTION 1. SHORT TITLE; TABLE OF CONTENTS.

2 (a) SHORT TITLE.—This Act may be cited as the
3 “America Competes Reauthorization Act of 2015”.

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. Federal research and development funding.
Sec. 102. National Science and Technology Council amendments.
Sec. 103. Review of Federal regulations and reporting requirements.
Sec. 104. Amendments to prize competitions.
Sec. 105. Coordination of international science and technology partnerships.
Sec. 106. Scientific and technical conferences.

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.

Subtitle C—Engineering Biology

Sec. 121. Short title.

- Sec. 122. Findings.
- Sec. 123. Definitions.
- Sec. 124. National Engineering Biology Research and Development Program.
- Sec. 125. Advisory Committee.
- Sec. 126. External review of ethical, legal, environmental, and societal issues.
- Sec. 127. Agency activities.

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. National Research Council report on STEAM education.
- Sec. 205. 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. Findings and sense of Congress on support for all fields of science and engineering.
- Sec. 303. National Science Foundation merit review.
- Sec. 304. Management and oversight of large facilities.
- 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. Hollings Manufacturing Extension Partnership.
- Sec. 404. National Academies review.
- Sec. 405. Improving NIST collaboration with other agencies.
- Sec. 406. Miscellaneous provisions.

TITLE V—INNOVATION

- Sec. 501. Office of Innovation and Entrepreneurship.
- Sec. 502. Federal loan guarantees for innovative technologies in manufacturing.
- Sec. 503. Innovation voucher pilot program.
- Sec. 504. Federal Acceleration of State Technology Commercialization Pilot Program.

TITLE VI—DEPARTMENT OF ENERGY

Subtitle A—Office of Science

- Sec. 601. Short title.
- Sec. 602. Definitions.
- Sec. 603. Mission of the Office of Science.
- Sec. 604. Basic energy sciences program.
- Sec. 605. Biological and environmental research.
- 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. Funding competitiveness for institutions of higher education and other nonprofit institutions.
- Sec. 645. Under Secretary for Science and Energy.
- Sec. 646. 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. FEDERAL RESEARCH AND DEVELOPMENT FUND-**
5 **ING.**

6 Congress finds the following:

7 (1) The predominant driver of gross domestic
8 product growth over the past half century has been
9 scientific and technological advancement.

10 (2) Investments in research and development
11 have also delivered significant benefits for national
12 security, health, energy security, education, and the
13 personal well-being of all Americans.

14 (3) Virtually every new technological product is
15 traceable to a research discovery, often one pursued
16 with no application in mind.

17 (4) Nondefense Federal research and develop-
18 ment accounts for only 1.7 percent of the Federal
19 budget. Federal basic research accounts for only 1
20 percent of the budget.

21 (5) There is a deficit between what America is
22 investing and what it should be investing to remain
23 competitive, not only in research but in technology
24 transfer, innovation, and job creation, thereby caus-

1 ing America’s highly successful science and tech-
2 nology enterprise to atrophy.

3 (6) Many research and development initiatives,
4 due to the long time periods required to achieve
5 completion, have benefited from stable and predict-
6 able investments and from multiyear financial plan-
7 ning.

8 (7) The Federal science agencies should receive
9 sustained and steady growth in funding for research
10 and development activities, including basic research,
11 across a wide range of disciplines, including physical,
12 geological, and life sciences, mathematics, engineer-
13 ing, and social, behavioral, and economic sciences.

14 **SEC. 102. NATIONAL SCIENCE AND TECHNOLOGY COUNCIL**
15 **AMENDMENTS.**

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

19 (1) in subsection (a), by striking “Federal Co-
20 ordinating Council for Science, Engineering, and
21 Technology” and inserting “National Science and
22 Technology Council”;

23 (2) in subsection (b), by striking “and Energy
24 Research and Development Administration” and in-

1 agencies that affect the conduct of United States research
2 in an effort to reduce regulatory burdens and to eliminate
3 and harmonize duplicative regulatory and reporting re-
4 quirements.

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

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

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

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

19 (C) identify any regulations that are ap-
20 plied to scientific researchers or to research-per-
21 forming institutions for which exemptions could
22 be reasonably applied or for which adjustments
23 could be made to better fit those regulations to
24 diverse research environments; and

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

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

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

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

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

22 (c) STAKEHOLDER INPUT.—In carrying out the re-
23 sponsibilities under subsection (b), including the develop-
24 ment of the strategic plan under subsection (b)(3), the
25 working group established or designated under subsection

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

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

20 (e) REPORT.—Not later than 1 year after the date
21 of enactment of this Act, the Director of the Office of
22 Science and Technology Policy shall transmit the priority
23 list and strategic plan developed under subsection (b)(3)
24 to the Congress. The Director shall further provide a re-
25 port annually to the Congress, to be submitted not later

1 than 60 days after the submission of the President’s an-
2 nual budget request, on the progress toward implementa-
3 tion of the regulatory reforms outlined in the strategic
4 plan.

5 **SEC. 104. AMENDMENTS TO PRIZE COMPETITIONS.**

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

8 (1) in subsection (c)—

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

11 (B) by inserting “types” after “following”;

12 and

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

15 (2) in subsection (f)—

16 (A) by striking “in the Federal Register”
17 and inserting “on a publicly accessible Govern-
18 ment website, such as www.challenge.gov,”; and

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

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

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

25 (5) in subsection (i)—

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

3 (B) in paragraph (2)(A), by inserting
4 “prize” before “competition” both places it ap-
5 pears;

6 (C) by redesignating paragraph (3) as
7 paragraph (4); and

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

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

16 (6) in subsection (j) by amending paragraph (2)
17 to read as follows:

18 “(2) INTELLECTUAL PROPERTY.—

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

23 “(B) OTHER CONDITIONS.—A Federal
24 agency or agencies in cooperation may require
25 participants to agree in advance to a specific

1 approach to intellectual property as a condition
2 for eligibility to participate in a prize competi-
3 tion.”;

4 (7) in subsection (k)—

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

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

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

15 (9) in subsection (m)—

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

18 “(1) IN GENERAL.—Support for a prize com-
19 petition under this section, including financial sup-
20 port for the design and administration of a prize
21 competition or funds for a cash prize purse, may
22 consist of Federal appropriated funds and funds
23 provided by private sector for-profit and nonprofit
24 entities. The head of an agency may accept funds
25 from other Federal agencies, private sector for-profit

1 entities, and nonprofit entities to support such prize
2 competitions. The head of an agency may not give
3 any special consideration to any private sector for-
4 profit or nonprofit entity in return for a donation.”;

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

7 (C) in paragraph (3)(A)—

8 (i) by striking “No prize” and insert-
9 ing “No prize competition”; and

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

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

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

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

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

20 (10) in subsection (n), by inserting “for both
21 for-profit and nonprofit entities,” after “contract ve-
22 hicle”;

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

1 (12) in subsection (p)—

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

4 (B) in paragraph (1)—

5 (i) by striking “of each year” and in-
6 serting “of each odd-numbered year”; and

7 (ii) by striking “preceding fiscal year”
8 and inserting “preceding 2 fiscal years”;
9 and

10 (C) in paragraph (2)—

11 (i) in subparagraph (C), by striking
12 “cash prizes” both places it occurs and in-
13 serting “cash prize purses”; and

14 (ii) by adding at the end the following
15 new subparagraph:

16 “(G) PLAN.—A description of crosscutting
17 topical areas and agency-specific mission needs
18 that may be the strongest opportunities for
19 prize competitions during the upcoming 2 fiscal
20 years.”.

21 **SEC. 105. COORDINATION OF INTERNATIONAL SCIENCE**
22 **AND TECHNOLOGY PARTNERSHIPS.**

23 (a) **SHORT TITLE.**—This section may be cited as the
24 “International Science and Technology Cooperation Act of
25 2015”.

1 (b) ESTABLISHMENT.—The Director of the Office of
2 Science and Technology Policy shall establish a body
3 under the National Science and Technology Council
4 (NSTC) with the responsibility to identify and coordinate
5 international science and technology cooperation that can
6 strengthen the United States science and technology en-
7 terprise, improve economic and national security, and sup-
8 port United States foreign policy goals.

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

13 (d) RESPONSIBILITIES.—The body established under
14 subsection (b) shall—

15 (1) plan and coordinate interagency inter-
16 national science and technology cooperative research
17 and training activities and partnerships supported or
18 managed by Federal agencies and work with other
19 National Science and Technology Council commit-
20 tees to help plan and coordinate the international
21 component of national science and technology prior-
22 ities;

23 (2) establish Federal priorities and policies for
24 aligning, as appropriate, international science and
25 technology cooperative research and training activi-

1 ties and partnerships supported or managed by Fed-
2 eral agencies with the foreign policy goals of the
3 United States;

4 (3) identify opportunities for new international
5 science and technology cooperative research and
6 training partnerships that advance both the science
7 and technology and the foreign policy priorities of
8 the United States;

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

14 (5) identify broad issues that influence the abil-
15 ity of United States scientists and engineers to col-
16 laborate with foreign counterparts, including bar-
17 riers to collaboration and access to scientific infor-
18 mation.

19 (e) REPORT TO CONGRESS.—The Director of the Of-
20 fice of Science and Technology Policy shall transmit a re-
21 port, to be updated annually, to the Committee on Science,
22 Space, and Technology and the Committee on Foreign Af-
23 fairs of the House of Representatives, and to the Com-
24 mittee on Commerce, Science, and Transportation and the
25 Committee on Foreign Relations of the Senate. The report

1 shall also be made available to the public on the reporting
2 agency's website. The report shall contain a description
3 of—

4 (1) the priorities and policies established under
5 subsection (d)(2);

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

8 (3) the means by which stakeholder input was
9 received, as well as summary views of stakeholder
10 input; and

11 (4) the issues influencing the ability of United
12 States scientists and engineers to collaborate with
13 foreign counterparts.

14 **SEC. 106. SCIENTIFIC AND TECHNICAL CONFERENCES.**

15 (a) FINDINGS.—Congress finds the following:

16 (1) Cooperative research and development ac-
17 tivities, including collaboration between domestic and
18 international government, industry, and academic
19 science and engineering organizations, are important
20 to promoting innovation and knowledge creation.

21 (2) Scientific and technical conferences and
22 trade events support the sharing of information,
23 processes, and data within the scientific and engi-
24 neering communities.

1 (3) In hosting and attending scientific and tech-
2 nical conferences and trade events, Federal agen-
3 cies—

4 (A) gain greater access to top researchers
5 and to new and potentially transformative
6 ideas;

7 (B) keep abreast of developments relevant
8 to their respective missions, as is relevant for
9 future program planning;

10 (C) help disseminate Federal research re-
11 sults;

12 (D) provide opportunities both for em-
13 ployee professional development and for recruit-
14 ing new employees;

15 (E) participate in scientific peer review;
16 and

17 (F) support the reputation, visibility, and
18 leadership both of the specific agency and of
19 the United States.

20 (4) For those Federal agencies that provide fi-
21 nancial support for external research and develop-
22 ment activities, participation in scientific and tech-
23 nical conferences can help ensure that funds are di-
24 rected toward the most promising ideas, thereby
25 maximizing the Federal investment.

1 (b) POLICY.—To the extent practicable given budget,
2 security, and other constraints, the National Science
3 Foundation, the National Institute of Standards and
4 Technology, and the Department of Energy, in addition
5 to the National Aeronautics and Space Administration,
6 should support Federal employee and contractor attend-
7 ance at scientific and technical conferences and trade
8 events as relevant both to employee and contractor duties
9 and to the agency’s mission.

10 (c) OVERSIGHT.—Consistent with other relevant law,
11 the Federal agencies, through appropriate oversight, shall
12 aim to minimize the costs to the Federal Government re-
13 lated to conference and trade event attendance, through
14 methods such as—

15 (1) ensuring that related fees collected by the
16 Federal agency help offset total costs to the Federal
17 Government;

18 (2) developing or maintaining procedures for in-
19 vestigating unexpected increases in related costs;
20 and

21 (3) strengthening policies and training relevant
22 to conference and trade event planning and partici-
23 pation.

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

3 **SEC. 111. SHORT TITLE.**

4 This subtitle may be cited as the “National Nano-
5 technology Initiative Amendments Act of 2015”.

6 **SEC. 112. NATIONAL NANOTECHNOLOGY PROGRAM AMEND-**
7 **MENTS.**

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

10 (1) in section 2—

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

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

20 “(A) how the Program will move results
21 out of the laboratory and into applications for
22 the benefit of society, including through co-
23 operation and collaborations with nanotechnol-
24 ogy research, development, and technology tran-
25 sition initiatives supported by the States; and

1 “(B) proposed research in areas of na-
2 tional importance in accordance with the re-
3 quirements of section 116 of the National
4 Nanotechnology Initiative Amendments Act of
5 2015;”;

6 (B) in subsection (d)—

7 (i) by redesignating paragraphs (1)
8 through (5) as paragraphs (2) through (6),
9 respectively;

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

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

15 (iii) by amending paragraph (6), as
16 redesignated by clause (i), to read as fol-
17 lows:

18 “(6) an assessment of how Federal agencies are
19 implementing the plan described in subsection (e)(7)
20 and a description of the amount of Small Business
21 Innovative Research and Small Business Technology
22 Transfer Research funds supporting the plan.”;

23 (C) by adding at the end the following new
24 subsection:

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

7 (2) in section 3—

8 (A) by amending subsection (b)(1) to read
9 as follows:

10 “(b) FUNDING.—

11 “(1) IN GENERAL.—The operation of the Na-
12 tional Nanotechnology Coordination Office shall be
13 supported by funds from each agency participating
14 in the Program.

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

21 “(3) EXCEPTION.—The Director of the Na-
22 tional Nanotechnology Coordination Office may es-
23 tablish a minimum contribution or other exception to
24 the requirement in paragraph (2) for participating
25 agencies whose share of the total budget for the Pro-

1 gram is below a threshold level, to be set by the Di-
2 rector.”; and

3 (B) by adding at the end the following new
4 subsection:

5 “(d) PUBLIC INFORMATION.—

6 “(1) DATABASE.—

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

16 “(B) ORGANIZATION.—Projects shall be
17 grouped by major objective as defined by the re-
18 search plan required under section 113(b) of
19 the National Nanotechnology Initiative Amend-
20 ments Act of 2015.

21 “(2) ACCESSIBLE FACILITIES.—

22 “(A) IN GENERAL.—The National Nano-
23 technology Coordination Office shall develop,
24 maintain, and publicize information on nano-
25 technology facilities supported under the Pro-

1 gram, and may include information on nano-
2 technology facilities supported by the States,
3 that are accessible for use by individuals from
4 academic institutions and from industry.

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

17 (3) in section 4—

18 (A) in subsection (a), by adding at the end
19 the following: “The co-chairs of the Advisory
20 Panel shall meet the qualifications of Panel
21 membership required in subsection (b) and may
22 be members of the President’s Council of Advi-
23 sors on Science and Technology. The Advisory
24 Panel shall include members having specific

1 qualifications tailored to enable it to carry out
2 the requirements of subsection (c)(6).”;

3 (B) in subsection (c)—

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

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

8 (C) by amending subsection (d) to read as
9 follows:

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

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

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

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

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

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

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

23 “(b) PRIORITY REPORTS.—If the Director of the Na-
24 tional Nanotechnology Coordination Office, working with
25 the National Research Council and with input from the
26 Advisory Panel, determines that a more narrowly focused

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

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

18 (5) in section 10—

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

21 “(2) NANOTECHNOLOGY.—The term ‘nanotech-
22 nology’ means the science and technology that will
23 enable one to understand, measure, model, image,
24 manipulate, and manufacture at the nanoscale,
25 aimed at creating materials, devices, and systems

1 with fundamentally new properties or functions.”;
2 and

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

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

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

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

21 (1) ensuring that a research plan for the envi-
22 ronmental, health, and safety research activities re-
23 quired under subsection (b) is developed, updated,
24 and implemented and that the plan is responsive to
25 the recommendations of the Advisory Panel estab-

1 lished under section 4(a) of the 21st Century Nano-
2 technology Research and Development Act (15
3 U.S.C. 7503(a)); and

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

11 (b) RESEARCH PLAN.—

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

1 the panel convened by the Coordinator shall solicit
2 and be responsive to recommendations and advice
3 from—

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

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

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

16 (A) standards related to nomenclature as-
17 sociated with engineered nanoscale materials;

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

21 (C) standards related to methods and pro-
22 cedures for detecting, measuring, monitoring,
23 sampling, and testing engineered nanoscale ma-
24 terials for environmental, health, and safety im-
25 pacts.

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

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

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

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

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

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

1 (5) UPDATING AND APPENDING TO REPORT.—

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

7 **SEC. 114. NANOTECHNOLOGY EDUCATION.**

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

14 (1) development of courses of instruction or
15 modules to existing courses;

16 (2) faculty professional development; and

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

20 (b) INTERAGENCY COORDINATION OF EDUCATION.—

21 The Committee established under section 2(c) of the 21st
22 Century Nanotechnology Research and Development Act
23 (15 U.S.C. 7501(c)) shall coordinate, as appropriate, with
24 the Committee established under section 101 of the Amer-
25 ica COMPETES Reauthorization Act of 2010 (42 U.S.C.

1 6621) to prioritize, plan, and assess the educational activi-
2 ties supported under the Program.

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

11 (d) REMOTE ACCESS TO NANOTECHNOLOGY FACILI-
12 TIES.—

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

24 (2) PROCEDURES.—The agencies identified in
25 paragraph (1) shall require the entities that operate

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

8 **SEC. 115. TECHNOLOGY TRANSFER.**

9 (a) **PROTOTYPING.**—

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

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

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

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

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

15 (3) SELECTION AND CRITERIA.—

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

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

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

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

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

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

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

24 (c) COORDINATION WITH STATE, REGIONAL, AND
25 LOCAL INITIATIVES.—Section 2(b)(5) of the 21st Century

1 Nanotechnology Research and Development Act (15
2 U.S.C. 7501(b)(5)) is amended to read as follows:

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

10 **SEC. 116. SIGNATURE INITIATIVES IN AREAS OF NATIONAL**
11 **IMPORTANCE.**

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

23 (b) CHARACTERISTICS.—

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

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

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

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

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

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

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

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

16 **SEC. 117. NANOMANUFACTURING RESEARCH.**

17 (a) RESEARCH AREAS.—The Program shall include
18 research on—

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

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

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

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

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

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

22 **SEC. 118. DEFINITIONS.**

23 In this subtitle, terms that are defined in section 10
24 of the 21st Century Nanotechnology Research and Devel-

1 opment Act (15 U.S.C. 7509) have the meaning given
2 those terms in that section.

3 **Subtitle C—Engineering Biology**

4 **SEC. 121. SHORT TITLE.**

5 This subtitle may be cited as the “Engineering Biol-
6 ogy Research and Development Act of 2015”.

7 **SEC. 122. FINDINGS.**

8 The Congress makes the following findings:

9 (1) Cellular and molecular processes may be
10 used, mimicked, or redesigned to develop new prod-
11 ucts, processes, and systems that improve societal
12 well-being, strengthen national security, and con-
13 tribute to the economy.

14 (2) Engineering biology relies on scientists and
15 engineers with a diverse and unique set of skills
16 combining the biological, physical, and information
17 sciences and engineering.

18 (3) Long-term research and development is nec-
19 essary to create breakthroughs in engineering biol-
20 ogy. Such research and development requires govern-
21 ment investment as the benefits are too distant or
22 uncertain for industry to support alone.

23 (4) The Federal Government can play an im-
24 portant role by facilitating the development of tools
25 and technologies to further advance engineering biol-

1 ogy, including multiple user facilities that the Fed-
2 eral Government is uniquely able to support.

3 (5) Since other countries are investing signifi-
4 cant resources in engineering biology, the United
5 States is at risk of losing its competitive lead in this
6 emerging area if it does not invest the necessary re-
7 sources and have a national strategy.

8 (6) A National Engineering Biology Initiative
9 can serve to establish new research directions and
10 technology goals, improve interagency coordination
11 and planning processes, drive technology transfer,
12 and help ensure optimal returns on the Federal in-
13 vestment.

14 **SEC. 123. DEFINITIONS.**

15 In this subtitle—

16 (1) the term “Advisory Committee” means the
17 advisory committee designated under section 125;

18 (2) the term “biomanufacturing” means the
19 manufacturing of products using biological manufac-
20 turing technologies;

21 (3) the term “engineering biology” means the
22 science and engineering of cellular and molecular
23 processes to advance fundamental understanding of
24 complex natural systems and to develop new and ad-
25 vance existing products, processes, and systems that

1 will contribute significantly to societal well-being,
2 national security, and the economy;

3 (4) the term “Interagency Committee” means
4 the interagency committee designated under section
5 124(e); and

6 (5) the term “Program” means the National
7 Engineering Biology Research and Development
8 Program established under section 124.

9 **SEC. 124. NATIONAL ENGINEERING BIOLOGY RESEARCH**
10 **AND DEVELOPMENT PROGRAM.**

11 (a) IN GENERAL.—The President shall implement a
12 National Engineering Biology Research and Development
13 Program to advance societal well-being, national security,
14 and economic productivity and competitiveness through—

15 (1) advancing areas of research at the intersec-
16 tion of the biological, physical, and information
17 sciences and engineering;

18 (2) supporting social science research that ad-
19 vances the field of engineering biology and contrib-
20 utes to the adoption of new products, processes, and
21 technologies;

22 (3) expanding the number of researchers, edu-
23 cators, and students with engineering biology train-
24 ing;

1 (4) accelerating the translation and commer-
2 cialization of engineering biology research and devel-
3 opment by the private sector; and

4 (5) improving the interagency planning and co-
5 ordination of Federal Government activities related
6 to engineering biology.

7 (b) PROGRAM ACTIVITIES.—The activities of the Pro-
8 gram shall include—

9 (1) sustained support for engineering biology
10 research and development through—

11 (A) grants to individual investigators and
12 interdisciplinary teams of investigators;

13 (B) projects funded under joint solicita-
14 tions by a collaboration of no fewer than two
15 agencies participating in the Program; and

16 (C) interdisciplinary research centers that
17 are organized to investigate basic research
18 questions and carry out technology development
19 and demonstration activities;

20 (2) education and training of undergraduate
21 and graduate students in research at the intersection
22 of biological, physical, and information sciences and
23 engineering;

1 (3) activities to develop robust mechanisms for
2 tracking and quantifying the outputs and economic
3 benefits of engineering biology; and

4 (4) activities to accelerate the translation and
5 commercialization of new products, processes, and
6 technologies by—

7 (A) identifying precompetitive research op-
8 portunities;

9 (B) facilitating public-private partnerships
10 in engineering biology research and develop-
11 ment;

12 (C) connecting researchers, graduate stu-
13 dents, and postdoctoral fellows with entrepre-
14 neurship education and training opportunities;
15 and

16 (D) supporting proof of concept activities
17 and the formation of startup companies includ-
18 ing through programs such as the Small Busi-
19 ness Innovation Research Program and the
20 Small Business Technology Transfer Program.

21 (c) EXPANDING PARTICIPATION.—The Program shall
22 include, to the maximum extent practicable, outreach to
23 primarily undergraduate and minority-serving institutions
24 about Program opportunities, and shall encourage the de-
25 velopment of research collaborations between research-in-

1 tensive universities and primarily undergraduate and mi-
2 nority-serving institutions.

3 (d) ETHICAL, LEGAL, ENVIRONMENTAL, AND SOCI-
4 ETAL ISSUES.—Program activities shall take into account
5 ethical, legal, environmental, and other appropriate soci-
6 etal issues, including the need for safeguards and moni-
7 toring systems to protect society against the unintended
8 release of engineered materials produced, by—

9 (1) supporting research, including in the social
10 sciences, and other activities addressing ethical,
11 legal, environmental, and other appropriate societal
12 issues related to engineering biology, including inte-
13 grating research on these topics with the research
14 and development in engineering biology, and ensur-
15 ing that the results of such research are widely dis-
16 seminated, including through interdisciplinary engi-
17 neering biology research centers described in sub-
18 section (b)(1)(C); and

19 (2) ensuring, through the agencies and depart-
20 ments that participate in the Program, that public
21 input and outreach are integrated into the Program
22 by the convening of regular and ongoing public dis-
23 cussions through mechanisms such as citizen panels,
24 consensus conferences, and educational events, as
25 appropriate.

1 (e) INTERAGENCY COMMITTEE.—The President shall
2 designate an interagency committee on engineering biol-
3 ogy, which shall include representatives from the Office
4 of Science and Technology Policy, the National Science
5 Foundation, the Department of Energy, the National Aer-
6 onautics and Space Administration, the National Institute
7 of Standards and Technology, the Environmental Protec-
8 tion Agency, and any other agency that the President con-
9 siders appropriate. The Director of the Office of Science
10 and Technology Policy shall select a chairperson from
11 among the members of the Interagency Committee. The
12 Interagency Committee shall oversee the planning, man-
13 agement, and coordination of the Program. The Inter-
14 agency Committee shall—

15 (1) provide for interagency coordination of Fed-
16 eral engineering biology research, development, and
17 other activities undertaken pursuant to the Pro-
18 gram;

19 (2) establish and periodically update goals and
20 priorities for the Program;

21 (3) develop, not later than 12 months after the
22 date of enactment of this subtitle, and update every
23 5 years, a strategic plan to guide the activities of the
24 Program and meet the goals and priorities estab-
25 lished under paragraph (2) and describe—

1 (A) the Program's support for long-term
2 funding for interdisciplinary engineering biology
3 research and development;

4 (B) the Program's support for education
5 and public outreach activities;

6 (C) the Program's support for research
7 and other activities on ethical, legal, environ-
8 mental, and other appropriate societal issues re-
9 lated to engineering biology; and

10 (D) how the Program will move results out
11 of the laboratory and into application for the
12 benefit of society and United States competi-
13 tiveness;

14 (4) propose an annually coordinated interagency
15 budget for the Program that will ensure the mainte-
16 nance of a robust engineering biology research and
17 development portfolio and ensure that the balance of
18 funding across the Program is sufficient to meet the
19 goals and priorities established for the Program;

20 (5) develop a plan to utilize Federal programs,
21 such as the Small Business Innovation Research
22 Program and the Small Business Technology Trans-
23 fer Program, in support of the goals described in
24 subsection (b)(4); and

1 (6) in carrying out its responsibilities under this
2 section, take into consideration the recommendations
3 of the Advisory Committee, the results of the work-
4 shop convened under section 126, existing reports on
5 related topics, and the views of academic, State, in-
6 dustry, and other appropriate groups.

7 (f) ANNUAL REPORT.—The Interagency Committee
8 shall prepare an annual report, to be submitted to the
9 Committee on Science, Space, and Technology of the
10 House of Representatives and the Committee on Com-
11 merce, Science, and Transportation of the Senate not later
12 than 90 days after submission of the President’s annual
13 budget request, that includes—

14 (1) the Program budget for the fiscal year to
15 which such budget request applies, and for the then
16 current fiscal year, including a breakout of spending
17 for each agency participating in the Program, and
18 for the development and acquisition of any research
19 facilities and instrumentation; and

20 (2) an assessment of how Federal agencies are
21 implementing the plan described in subsection
22 (e)(5), and a description of the amount and number
23 of Small Business Innovation Research and Small
24 Business Technology Transfer awards made in sup-
25 port of the Program.

1 **SEC. 125. ADVISORY COMMITTEE.**

2 (a) IN GENERAL.—The President shall designate an
3 advisory committee on engineering biology research and
4 development with at least 12 members, including rep-
5 resentatives of research and academic institutions, indus-
6 try, and nongovernmental entities, who are qualified to
7 provide advice on the Program.

8 (b) ASSESSMENT.—The Advisory Committee shall as-
9 sess—

10 (1) progress made in implementing the Pro-
11 gram;

12 (2) the need to revise the Program;

13 (3) the balance of activities and funding across
14 the Program;

15 (4) whether the Program priorities and goals
16 developed by the Interagency Committee are helping
17 to maintain United States leadership in engineering
18 biology;

19 (5) the management, coordination, implementa-
20 tion, and activities of the Program; and

21 (6) whether ethical, legal, environmental, and
22 other appropriate societal issues are adequately ad-
23 dressed by the Program.

24 (c) REPORTS.—The Advisory Committee shall report
25 within 3 years after the date of enactment of this Act,
26 and thereafter not less frequently than once every 5 years,

1 to the President, the Committee on Science, Space, and
2 Technology of the House of Representatives, and the Com-
3 mittee on Commerce, Science, and Transportation of the
4 Senate, on its findings of the assessment carried out under
5 this section and its recommendations for ways to improve
6 the Program.

7 (d) FEDERAL ADVISORY COMMITTEE ACT APPLICA-
8 TION.—Section 14 of the Federal Advisory Committee Act
9 (5 U.S.C. App.) shall not apply to the Advisory Com-
10 mittee.

11 **SEC. 126. EXTERNAL REVIEW OF ETHICAL, LEGAL, ENVI-**
12 **RONMENTAL, AND SOCIETAL ISSUES.**

13 (a) IN GENERAL.—Not later than 12 months after
14 the date of enactment of this Act, the Director of the Na-
15 tional Science Foundation shall enter into an agreement
16 with the National Academies to convene a workshop to
17 review the ethical, legal, environmental, and other appro-
18 priate societal issues related to engineering biology re-
19 search and development. The goals of the workshop shall
20 be to—

- 21 (1) assess the current research on such issues;
- 22 (2) evaluate the research gaps relating to such
23 issues; and
- 24 (3) provide recommendations on how the Pro-
25 gram can address the research needs identified.

1 (b) REPORT TO CONGRESS.—Not later than 2 years
2 after the date of enactment of this Act, the Director of
3 the National Science Foundation shall transmit to the
4 Committee on Science, Space, and Technology of the
5 House of Representatives and the Committee on Com-
6 merce, Science, and Transportation of the Senate a sum-
7 mary report containing the findings of the workshop con-
8 vened under this section.

9 **SEC. 127. AGENCY ACTIVITIES.**

10 (a) NATIONAL SCIENCE FOUNDATION.—As part of
11 the Program, the National Science Foundation shall—

12 (1) support basic research at the intersection of
13 the biological, physical, and information sciences and
14 engineering through individual grants and through
15 interdisciplinary research centers;

16 (2) support research on the environmental and
17 social effects of engineering biology;

18 (3) provide research instrumentation support
19 for engineering biology disciplines; and

20 (4) award grants, on a competitive basis, to en-
21 able institutions to support graduate students and
22 postdoctoral fellows who perform some of their engi-
23 neering biology research in an industry setting.

1 (b) DEPARTMENT OF COMMERCE.—As part of the
2 Program, the Director of the National Institute of Stand-
3 ards and Technology shall—

4 (1) establish a bioscience research program to
5 advance the development of standard reference ma-
6 terials and measurements and to create new data
7 tools, techniques, and processes necessary to advance
8 engineering biology and biomanufacturing;

9 (2) provide access to user facilities with ad-
10 vanced or unique equipment, services, materials, and
11 other resources to industry, institutions of higher
12 education, nonprofit organizations, and government
13 agencies to perform research and testing; and

14 (3) provide technical expertise to inform the de-
15 velopment of guidelines and safeguards for new
16 products, processes, and systems of engineering biol-
17 ogy.

18 (c) DEPARTMENT OF ENERGY.—As part of the Pro-
19 gram, the Secretary of Energy shall—

20 (1) conduct and support basic research, devel-
21 opment, demonstration, and commercial application
22 activities in engineering biology disciplines, including
23 in the areas of synthetic biology, advanced biofuel
24 development, biobased materials, and environmental
25 remediation; and

1 (2) provide access to user facilities with ad-
2 vanced or unique equipment, services, materials, and
3 other resources, as appropriate, to industry, institu-
4 tions of higher education, nonprofit organizations,
5 and government agencies to perform research and
6 testing.

7 (d) NATIONAL AERONAUTICS AND SPACE ADMINIS-
8 TRATION.—As part of the Program, the National Aero-
9 nautics and Space Administration shall—

10 (1) conduct and support basic and applied re-
11 search in engineering biology fields, including in the
12 field of synthetic biology, and related to Earth and
13 space sciences, aeronautics, space technology, and
14 space exploration and experimentation, consistent
15 with the priorities established in the National Acad-
16 emies' decadal surveys; and

17 (2) award grants, on a competitive basis, that
18 enable institutions to support graduate students and
19 postdoctoral fellows who perform some of their engi-
20 neering biology research in an industry setting.

21 (e) ENVIRONMENTAL PROTECTION AGENCY.—As
22 part of the Program, the Environmental Protection Agen-
23 cy shall support research on how products, processes, and
24 systems of engineering biology will affect the environment.

1 **TITLE II—STEM EDUCATION AND**
2 **DIVERSITY**

3 **Subtitle A—STEM Education and**
4 **Workforce**

5 **SEC. 201. SENSE OF CONGRESS.**

6 It is the sense of Congress that the National Science
7 and Technology Council’s Committee on STEM Education
8 (CoSTEM), established under section 101 of the America
9 COMPETES Reauthorization Act of 2010 (42 U.S.C.
10 6621), has taken important initial steps toward developing
11 and implementing a strategic plan for Federal investments
12 in STEM education, but that more work must be done
13 to solicit and take into account views and experience from
14 stakeholders who help implement or are the beneficiaries
15 of Federal STEM programs across the Nation. It is fur-
16 ther the sense of Congress that science mission agencies
17 such as the National Aeronautics and Space Administra-
18 tion, the National Oceanic and Atmospheric Administra-
19 tion, and the Department of Energy are essential partners
20 in contributing to the goals and implementation of a Fed-
21 eral STEM strategic plan because such agencies have
22 unique scientific and technological facilities as well as
23 highly trained scientists who are eager and able to con-
24 tribute to improved STEM learning outcomes in their own
25 communities.

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

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

4 (1) in subsection (b)(5)—

5 (A) by redesignating subparagraphs (A)
6 through (D) as subparagraphs (B) through (E),
7 respectively; and

8 (B) by inserting before subparagraph (B),
9 as so redesigned by subparagraph (A) of this
10 paragraph, the following new subparagraph:

11 “(A) have as its primary goal to leverage
12 the limited STEM education funding and other
13 assets, including intellectual capital, invested by
14 Federal STEM agencies for maximum benefit
15 to student learning;”;

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

17 (3) by redesignating subsection (c) as sub-
18 section (f);

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

21 “(c) COORDINATOR FOR STEM EDUCATION.—The
22 Director of the Office of Science and Technology Policy
23 shall designate an associate director of the Office of
24 Science and Technology Policy as the Coordinator for
25 STEM Education. When an appropriate associate director
26 is not available, the Director may designate another ap-

1 appropriate senior government official as the Coordinator for
2 STEM Education. The Coordinator shall chair the com-
3 mittee established under subsection (a). The Coordinator
4 shall, with the assistance of appropriate senior officials
5 from other Committee on STEM Education agencies, en-
6 sure that the requirements of this section are satisfied.

7 “(d) STAKEHOLDER INPUT.—

8 “(1) INTERAGENCY CONSOLIDATION.—For all
9 agency proposals to consolidate or transfer budgets
10 or functions for STEM education programs or ac-
11 tivities between agencies, at the time of submission
12 of such proposals to Congress, the Director shall re-
13 port to Congress on activities undertaken by the Of-
14 fice of Science and Technology Policy or by relevant
15 agencies to take into consideration relevant input
16 from the STEM Education Advisory Panel estab-
17 lished under subsection (e) and other relevant edu-
18 cation stakeholders.

19 “(2) INTRAAGENCY CONSOLIDATION.—For all
20 agency proposals to internally consolidate or termi-
21 nate STEM education programs with budgets ex-
22 ceeding \$10,000,000, at the time of submission of
23 such proposals to Congress, the head of the relevant
24 agency shall report to Congress on activities to so-
25 licit and take into consideration input on such pro-

1 proposals from the STEM Education Advisory Panel
2 established under subsection (e) and other relevant
3 education stakeholders.

4 “(e) STEM EDUCATION ADVISORY PANEL.—

5 “(1) IN GENERAL.—The President shall estab-
6 lish or designate a STEM Education Advisory
7 Panel. The cochairs of the Advisory Panel shall meet
8 the qualifications of Panel membership required in
9 paragraph (2) and may be members of the Presi-
10 dent’s Council of Advisors on Science and Tech-
11 nology.

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

1 “(3) DUTIES.—The Advisory Panel shall advise
2 the President and the committee established under
3 subsection (a) on implementing the Federal STEM
4 education strategic plan required under subsection
5 (b)(5) and coordinating Federal STEM programs
6 with nongovernmental STEM initiatives and State
7 and local educational agencies.

8 “(4) REPORT.—The Advisory Panel shall re-
9 port, not more than 1 year after enactment of the
10 America Competes Reauthorization Act of 2015, on
11 options for evidence-based implementation of the
12 Federal STEM strategic plan required under sub-
13 section (b)(5), including options for designating cer-
14 tain agencies as coordinating leads for different pri-
15 ority investment areas, timelines for implementation,
16 and specific management, budget, policy, or other
17 steps that agencies must take to effectively imple-
18 ment the strategic plan.

19 “(5) SUNSET.—The authorization for the Advi-
20 sory Panel established under this subsection shall
21 expire 3 years after the date of enactment of the
22 America Competes Reauthorization Act of 2015.”;
23 and

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

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

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

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

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

7 (a) IN GENERAL.—The Director of the National
8 Science Foundation and the Secretary of Education shall
9 collaborate in—

10 (1) identifying, prioritizing, and developing
11 strategies to address grand challenges in research
12 and development, including assessment, on the
13 teaching and learning of STEM at the pre-K–12
14 level, in formal and informal settings, for diverse
15 learning populations, including individuals identified
16 in section 33 or 34 of the Science and Engineering
17 Equal Opportunities Act (42 U.S.C. 1885a or
18 1885b); and

19 (2) ensuring the dissemination and promoting
20 the utilization of the results of such research and de-
21 velopment.

22 (b) STAKEHOLDER INPUT.—In identifying the grand
23 challenges under subsection (a), the Director and the Sec-
24 retary shall—

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

6 (2) solicit input from a wide range of stake-
7 holders, including officials from State educational
8 agencies and local educational agencies, STEM
9 teachers, STEM education researchers, scientific
10 and engineering societies, STEM faculty at institu-
11 tions of higher education, informal STEM education
12 providers, businesses with a large STEM workforce,
13 and other stakeholders in the teaching and learning
14 of STEM at the pre-K–12 level, and may enter into
15 an arrangement with the National Research Council
16 for these purposes.

17 (c) TOPICS TO CONSIDER.—In identifying the grand
18 challenges under subsection (a), the Director and the Sec-
19 retary shall, at a minimum, consider research and develop-
20 ment on—

21 (1) scalability, sustainability, and replication of
22 successful STEM activities, programs, and models,
23 in formal and informal environments;

24 (2) model systems that support improved teach-
25 ing and learning of STEM across entire local edu-

- 1 cational agencies and States, including rural areas,
2 and encompassing and integrating the teaching and
3 learning of STEM in formal and informal venues;
- 4 (3) implementation of new State mathematics
5 and science standards;
- 6 (4) what makes a STEM teacher effective and
7 STEM teacher professional development effective,
8 including development of tools and methodologies to
9 measure STEM teacher effectiveness;
- 10 (5) cyber-enabled and other technology tools for
11 teaching and learning, including massive open online
12 courses;
- 13 (6) STEM teaching and learning in informal
14 environments, including development of tools and
15 methodologies for assessing STEM teaching and
16 learning in informal environments; and
- 17 (7) how integrating engineering with mathe-
18 matics and science education may—
- 19 (A) improve student learning of mathe-
20 matics and science;
- 21 (B) increase student interest and persist-
22 ence in STEM; or
- 23 (C) improve student understanding of engi-
24 neering design principles and of the built world.

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

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

7 (2) the role of each agency in supporting re-
8 search and development activities to address the
9 grand challenges;

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

12 (4) plans for periodically updating the grand
13 challenges;

14 (5) how the agencies will disseminate and pro-
15 mote the utilization of the results of research and
16 development activities carried out under this section
17 to STEM education practitioners, to other Federal
18 agencies that support STEM programs and activi-
19 ties, and to non-Federal funders of STEM edu-
20 cation; and

21 (6) how the agencies will support implementa-
22 tion of best practices identified by the research and
23 development activities.

1 **SEC. 204. 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. 205. 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 2015”.

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 2016 through 2018 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 under the Indiana University
22 Center for Postsecondary Research Carnegie
23 Classification on January 1, 2015, as a doc-
24 torate-granting university with a very high level
25 of research activity; and

1 (B) requires each institution identified in
2 subparagraph (A), not later than 3 years after
3 the date of enactment of this Act, to report to
4 the Director of the National Science Founda-
5 tion on activities and policies developed and im-
6 plemented based on the guidance provided in
7 paragraph (1).

8 (b) BEST PRACTICES AT FEDERAL LABORA-
9 TORIES.—

10 (1) DEVELOPMENT OF GUIDANCE.—Not later
11 than 6 months after the date of enactment of this
12 Act, the Director of the Office of Science and Tech-
13 nology Policy shall develop written guidance for Fed-
14 eral laboratories to develop and implement practices
15 and policies to—

16 (A) conduct periodic laboratorywide culture
17 surveys of research personnel at all levels, with
18 a particular focus on identifying any cultural or
19 institutional barriers to the recruitment, reten-
20 tion, and success of women and underrep-
21 resented minorities in STEM careers at Federal
22 laboratories; and

23 (B) provide educational opportunities, in-
24 cluding workshops as described in subsection
25 (c), for STEM research personnel to learn

1 about current research in implicit bias in re-
2 recruitment, 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-

1 tion to any other organizations made eligible by the
2 Federal science agencies, the following organizations
3 are eligible for grants under this subsection:

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

7 (B) Nonprofit organizations that have the
8 primary mission of advancing the participation
9 of women or underrepresented minorities in
10 STEM.

11 (6) CHARACTERISTICS OF WORKSHOPS.—The
12 workshops shall have the following characteristics:

13 (A) Invitees to workshops shall include at
14 least—

15 (i) the chairs of departments in the
16 relevant STEM discipline or disciplines
17 from at least the top 50 institutions of
18 higher education, as determined by the
19 amount of Federal research and develop-
20 ment funds obligated to each institution of
21 higher education in the prior year based on
22 data available from the National Science
23 Foundation; and

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

1 responsibilities 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-

1 ports submitted under paragraph (4) of such sub-
2 section; and

3 (2) a description and evaluation of the status
4 and effectiveness of the program of workshops re-
5 quired under subsection (c), including a summary of
6 any data reported under paragraph (8) of such sub-
7 section.

8 (e) AUTHORIZATION OF APPROPRIATIONS.—There
9 are authorized to be appropriated to the Director of the
10 National Science Foundation \$2,000,000 for each of fiscal
11 years 2016 through 2020 to carry out this section.

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

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

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

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

24 (3) research grants to study the impact of poli-
25 cies 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 2016 through 2020 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 2016 through 2020 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 2016 through 2020 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 2014.

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 other academic subjects that build on these dis-
12 ciplines such as computer science.

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

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

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

21 “(16) STEM.—The term ‘STEM’ means
22 science, technology, engineering, and mathematics,
23 including other academic subjects that build on
24 these disciplines such as computer science.”.

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

3 **Subtitle A—General Provisions**

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

5 (a) FISCAL YEAR 2016.—

6 (1) IN GENERAL.—There are authorized to be
7 appropriated to the Foundation \$7,723,550,000 for
8 fiscal year 2016.

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

11 (A) \$6,186,300,000 shall be made avail-
12 able for research and related activities;

13 (B) \$962,570,000 shall be made available
14 for education and human resources;

15 (C) \$200,310,000 shall be made available
16 for major research equipment and facilities con-
17 struction;

18 (D) \$354,840,000 shall be made available
19 for agency operations and award management;

20 (E) \$4,370,000 shall be made available for
21 the Office of the National Science Board, in-
22 cluding salaries and compensation for members
23 of the Board and staff appointed under section
24 4 of the National Science Foundation Act of
25 1950 (42 U.S.C. 1863), travel and training

1 costs for members of the Board and such staff,
2 general and Board operating expenses, rep-
3 resentational expenses for the Board, honorary
4 awards made by the Board, Board reports
5 (other than the report entitled “Science and
6 Engineering Indicators”), and contracts; and

7 (F) \$15,160,000 shall be made available
8 for the Office of Inspector General.

9 (b) FISCAL YEAR 2017.—

10 (1) IN GENERAL.—There are authorized to be
11 appropriated to the Foundation \$8,099,010,000 for
12 fiscal year 2017.

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

15 (A) \$6,495,620,000 shall be made avail-
16 able for research and related activities;

17 (B) \$1,010,700,000 shall be made avail-
18 able for education and human resources;

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

22 (D) \$372,580,000 shall be made available
23 for agency operations and award management;

24 (E) \$4,500,000 shall be made available for
25 the Office of the National Science Board, in-

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

11 (F) \$15,610,000 shall be made available
12 for the Office of Inspector General.

13 (c) FISCAL YEAR 2018.—

14 (1) IN GENERAL.—There are authorized to be
15 appropriated to the Foundation \$8,493,560,000 for
16 fiscal year 2018.

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

19 (A) \$6,820,400,000 shall be made avail-
20 able for research and related activities;

21 (B) \$1,061,230,000 shall be made avail-
22 able for education and human resources;

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

1 (D) \$391,210,000 shall be made available
2 for agency operations and award management;

3 (E) \$4,640,000 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) \$16,080,000 shall be made available
16 for the Office of Inspector General.

17 (d) FISCAL YEAR 2019.—

18 (1) IN GENERAL.—There are authorized to be
19 appropriated to the Foundation \$8,907,820,000 for
20 fiscal year 2019.

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

23 (A) \$7,161,420,000 shall be made avail-
24 able for research and related activities;

1 (B) \$1,114,300,000 shall be made avail-
2 able for education and human resources;

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

6 (D) \$410,770,000 shall be made available
7 for agency operations and award management;

8 (E) \$4,780,000 shall be made available for
9 the Office of the National Science Board, in-
10 cluding salaries and compensation for members
11 of the Board and staff appointed under section
12 4 of the National Science Foundation Act of
13 1950 (42 U.S.C. 1863), travel and training
14 costs for members of the Board and such staff,
15 general and Board operating expenses, rep-
16 resentational expenses for the Board, honorary
17 awards made by the Board, Board reports
18 (other than the report entitled “Science and
19 Engineering Indicators”), and contracts; and

20 (F) \$16,570,000 shall be made available
21 for the Office of Inspector General.

22 (e) FISCAL YEAR 2020.—

23 (1) IN GENERAL.—There are authorized to be
24 appropriated to the Foundation \$9,342,790,000 for
25 fiscal year 2020.

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

3 (A) \$7,519,490,000 shall be made avail-
4 able for research and related activities;

5 (B) \$1,170,010,000 shall be made avail-
6 able for education and human resources;

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

10 (D) \$431,310,000 shall be made available
11 for agency operations and award management;

12 (E) \$4,920,000 shall be made available for
13 the Office of the National Science Board, in-
14 cluding salaries and compensation for members
15 of the Board and staff appointed under section
16 4 of the National Science Foundation Act of
17 1950 (42 U.S.C. 1863), travel and training
18 costs for members of the Board and such staff,
19 general and Board operating expenses, rep-
20 resentational expenses for the Board, honorary
21 awards made by the Board, Board reports
22 (other than the report entitled “Science and
23 Engineering Indicators”), and contracts; and

24 (F) \$17,060,000 shall be made available
25 for the Office of Inspector General.

1 **SEC. 302. FINDINGS AND SENSE OF CONGRESS ON SUP-**
2 **PORT FOR ALL FIELDS OF SCIENCE AND EN-**
3 **GINEERING.**

4 (a) FINDINGS.—Congress finds that the Founda-
5 tion’s investments in social, behavioral, and economic re-
6 search have addressed challenges, including—

7 (1) in medicine, matching organ donors to pa-
8 tients, leading to a dramatic growth in paired kidney
9 transplants;

10 (2) in policing, implementing predictive models
11 that help to yield significant reductions in crime;

12 (3) in resource allocation, developing the theo-
13 ries underlying the Federal Communications Com-
14 mission spectrum auction, which has generated over
15 \$60,000,000,000 in revenue;

16 (4) in disaster preparation and recovery, identi-
17 fying barriers to effective disaster evacuation strate-
18 gies;

19 (5) in national defense, assisting United States
20 troops in cross-cultural communication and in identi-
21 fying threats; and

22 (6) in areas such as economics, education, cy-
23 bersecurity, transportation, and national defense,
24 supporting informed decisionmaking in foreign and
25 domestic policy.

1 (b) SENSE OF CONGRESS.—It is the sense of Con-
2 gress that in order to achieve its mission “to promote the
3 progress of science; to advance the national health, pros-
4 perity, and welfare; to secure the national defense” the
5 Foundation must continue to support unfettered, competi-
6 tive, merit-reviewed basic research across all fields of
7 science and engineering, including the social, behavioral,
8 and economic sciences.

9 **SEC. 303. NATIONAL SCIENCE FOUNDATION MERIT REVIEW.**

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

12 (1) the Foundation’s Intellectual Merit and
13 Broader Impacts criteria remain appropriate for
14 evaluating grant proposals, as concluded by the
15 2011 National Science Board Task Force on Merit
16 Review;

17 (2) evaluating proposals on the basis of the
18 Foundation’s Intellectual Merit and Broader Im-
19 pacts criteria ensures that—

20 (A) proposals funded by the Foundation
21 are of high quality and advance scientific
22 knowledge; and

23 (B) the Foundation’s overall funding port-
24 folio addresses societal needs through research
25 findings or through related activities; and

1 project planning, budgeting, implementation, man-
2 agement, and oversight; and

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

6 (b) OVERSIGHT OF LARGE FACILITIES.—The Direc-
7 tor shall appoint a senior agency official within the Office
8 of the Director whose primary responsibility is oversight
9 of major research facilities. The duties of this official shall
10 include—

11 (1) oversight of the development, construction,
12 and operation of major research facilities across the
13 Foundation;

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

19 (3) serving as a liaison to the National Science
20 Board for approval and oversight of major research
21 facilities; and

22 (4) periodically reviewing and updating as nec-
23 essary Foundation policies and guidelines for the de-
24 velopment and construction of major research facili-
25 ties.

1 (c) POLICIES FOR COSTING LARGE FACILITIES.—

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

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

16 **SEC. 305. SUPPORT FOR POTENTIALLY TRANSFORMATIVE**
17 **RESEARCH.**

18 (a) IN GENERAL.—The Director shall establish and
19 periodically update grant solicitation, merit review, and
20 funding policies and mechanisms designed to identify and
21 provide support for high-risk, high-reward basic research
22 proposals.

23 (b) POLICIES AND MECHANISMS.—Such policies and
24 mechanisms may include—

1 minority-serving institutions or predominantly under-
2 graduate institutions and one or more institutions de-
3 scribed in subsection (b), the Director shall award funds
4 directly, according to the budget justification described in
5 the grant proposal, to at least two of the institutions of
6 higher education in the partnership, including at least one
7 minority-serving institution or one predominantly under-
8 graduate institution, to ensure a strong and equitable
9 partnership.

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

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

21 **SEC. 307. INNOVATION CORPS.**

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

24 (1) the National Science Foundation’s Inno-
25 vation Corps (I-Corps) was established to foster a na-

1 tional innovation ecosystem by encouraging institu-
2 tions, scientists, engineers, and entrepreneurs to
3 identify and explore the innovation and commercial
4 potential of Foundation-funded research well beyond
5 the laboratory;

6 (2) the Foundation's I-Corps includes invest-
7 ments in entrepreneurship and commercialization
8 education, training, and mentoring, ultimately lead-
9 ing to the practical deployment of technologies,
10 products, processes, and services that improve the
11 Nation's competitiveness, promote economic growth,
12 and benefit society; and

13 (3) by building networks of entrepreneurs, edu-
14 cators, mentors, institutions, and collaborations, and
15 supporting specialized education and training, I-
16 Corps is at the leading edge of a strong, lasting
17 foundation for an American innovation ecosystem.

18 (b) PROGRAM.—

19 (1) IN GENERAL.—The Director shall carry out
20 a program to award grants for entrepreneurship and
21 commercialization education to Foundation-funded
22 researchers to increase the economic and social im-
23 pact of federally funded research.

24 (2) PURPOSES.—The purpose of the program
25 shall be to increase the capacity of STEM research-

1 ers and students to successfully engage in entrepre-
2 neurial activities and to help transition the results of
3 federally funded research into the marketplace by—

4 (A) identifying STEM research that can
5 lead to the practical deployment of technologies,
6 products, processes, and services that improve
7 the Nation’s economic competitiveness;

8 (B) bringing STEM researchers and stu-
9 dents together with entrepreneurs, venture cap-
10 italists, and other industry representatives expe-
11 rienced in commercialization of new tech-
12 nologies;

13 (C) supporting entrepreneurship and com-
14 mercialization education and training for fac-
15 ulty, students, postdoctoral fellows, and other
16 STEM researchers; and

17 (D) promoting the development of regional
18 and national networks of entrepreneurs, venture
19 capitalists, and other industry representatives
20 who can serve as mentors to researchers and
21 students at Foundation-funded institutions
22 across the country.

23 (3) **ADDITIONAL USE OF FUNDS.**—Grants
24 awarded under this subsection may be used to help
25 support—

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

3 (B) additional activities needed to build a
4 national infrastructure for STEM entrepreneur-
5 ship.

6 (4) OTHER FEDERAL AGENCIES.—The Director
7 may establish agreements with other Federal agen-
8 cies that fund scientific research to make research-
9 ers funded by those agencies eligible to participate
10 in the Foundation’s Innovation Corps program.

11 **SEC. 308. DEFINITIONS.**

12 For purposes of this title:

13 (1) DIRECTOR.—The term “Director” means
14 the Director of the Foundation.

15 (2) FOUNDATION.—The term “Foundation”
16 means the National Science Foundation.

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

21 (4) STEM.—The term “STEM” means science,
22 technology, engineering, and mathematics, including
23 other academic subjects that build on these dis-
24 ciplines such as computer science.

1 **Subtitle B—STEM Education**

2 **SEC. 321. NATIONAL SCIENCE BOARD REPORT ON CONSOLI-**
3 **DATION OF STEM EDUCATION ACTIVITIES AT**
4 **THE FOUNDATION.**

5 (a) **IN GENERAL.**—The National Science Board shall
6 review and evaluate the appropriateness of the Founda-
7 tion’s portfolio of STEM education programs and activi-
8 ties at the pre-K–12 and undergraduate levels, including
9 informal education, taking into account the mission of the
10 Foundation and the 2013 Federal STEM Education 5-
11 Year Strategic Plan.

12 (b) **REPORT.**—Not later than 1 year after the date
13 of enactment of this Act, the National Science Board shall
14 submit to Congress a report summarizing their findings
15 and including—

16 (1) an analysis of how well the Foundation’s
17 portfolio of STEM education programs is contrib-
18 uting to the mission of the Foundation;

19 (2) an analysis of how well STEM education
20 programs and activities are coordinated and best
21 practices are shared across the Foundation;

22 (3) an analysis of how well the Foundation’s
23 portfolio of STEM education programs is aligned
24 with and contributes to priority STEM education in-

1 vestment areas described in the 2013 Federal STEM
2 Education 5-Year Strategic Plan;

3 (4) any Board recommendations regarding in-
4 ternal reorganization, including consolidation, of the
5 Foundation's STEM education programs and activi-
6 ties, taking into account both the mission of the
7 Foundation and the 2013 Federal STEM Education
8 5-Year Strategic Plan;

9 (5) any Board recommendations regarding the
10 Foundation's role in helping to implement the Fed-
11 eral STEM Education 5-Year Strategic Plan, includ-
12 ing opportunities for the Foundation to more effec-
13 tively partner and collaborate with other Federal
14 agencies; and

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

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

21 (a) IN GENERAL.—The Director shall enter into an
22 agreement with the National Research Council to convene
23 a workshop or roundtable to examine models of Federal
24 support for STEM graduate students, including the Foun-
25 dation's Graduate Research Fellowship program and com-

1 parable fellowship programs at other agencies, traineeship
2 programs, and the research assistant model.

3 (b) PURPOSE.—The purpose of the workshop or
4 roundtable shall be to compare and evaluate the extent
5 to which each of these models helps to prepare graduate
6 students for diverse careers utilizing STEM degrees, in-
7 cluding at diverse types of institutions of higher education,
8 in industry, and at government agencies and research lab-
9 oratories, and to make recommendations regarding—

10 (1) how current Federal programs and models,
11 including programs and models at the Foundation,
12 can be improved;

13 (2) the appropriateness of the current distribu-
14 tion of funding among the different models at the
15 Foundation and across the agencies; and

16 (3) the appropriateness of creating a new edu-
17 cation and training program for graduate students
18 distinct from programs that provide direct financial
19 support, including the grants authorized in section
20 527 of the America COMPETES Reauthorization
21 Act of 2010 (42 U.S.C. 1862p–15).

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

1 (1) to become independent, creative, successful
2 researchers;

3 (2) to participate in large interdisciplinary re-
4 search projects, including in an international con-
5 text;

6 (3) to adhere to the highest standards for re-
7 search ethics;

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

10 (5) in oral and written communication, to both
11 technical and nontechnical audiences;

12 (6) in innovation, entrepreneurship, and busi-
13 ness ethics; and

14 (7) in program management.

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

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

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

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

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

6 “(a) IN GENERAL.—The Director, through the Direc-
7 torate for Education and Human Resources, shall award
8 grants, on a competitive, merit-reviewed basis, to institu-
9 tions of higher education (or to consortia thereof) and to
10 other eligible nonprofit organizations to reform under-
11 graduate STEM education for the purpose of increasing
12 the number and quality of students studying toward and
13 completing baccalaureate degrees in STEM and improving
14 the STEM learning outcomes for all undergraduate stu-
15 dents.

16 “(b) INTERDIRECTORATE WORKING GROUP ON UN-
17 DERGRADUATE STEM EDUCATION.—In carrying out the
18 requirements of this section, the Directorate for Education
19 and Human Resources shall collaborate and coordinate
20 with the Research Directorates, including through the es-
21 tablishment of an interdirectorate working group on un-
22 dergraduate STEM education reform, in order to identify
23 and implement new and expanded opportunities for col-
24 laboration between STEM disciplinary researchers and
25 education researchers on the reform of undergraduate
26 STEM education.

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

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

7 “(2) development, implementation, and assess-
8 ment of innovative, research-based approaches to
9 transforming teaching, learning, and retention; and

10 “(3) scaling of successful efforts on learning
11 and learning environments, broadening participation,
12 workforce preparation, employing emerging tech-
13 nologies, or other reforms in STEM education, in-
14 cluding expansion of successful STEM reform ef-
15 forts beyond a single course or group of courses to
16 achieve reform within an entire academic unit, or ex-
17 pansion of successful reform efforts beyond a single
18 academic unit to other STEM academic units within
19 an institution or to comparable academic units at
20 other institutions.

21 “(d) SELECTION PROCESS.—

22 “(1) APPLICATIONS.—An institution of higher
23 education or other eligible nonprofit organization
24 seeking a grant under this section shall submit an
25 application to the Director at such time, in such

1 manner, and containing such information as the Di-
2 rector may require. In addition to a description of
3 the proposed research, development, or scaling ef-
4 fort, including a description of the research findings
5 that will serve as the basis for the proposed effort,
6 applications shall include, at a minimum—

7 “(A) evidence of institutional support for,
8 and commitment to, the proposed effort, includ-
9 ing long-term commitment to implement and
10 scale successful strategies resulting from the
11 current effort;

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

17 “(C) a description of the plans for assess-
18 ment and evaluation of the effort, including evi-
19 dence of participation by individuals with expe-
20 rience in assessment and evaluation of teaching
21 and learning programs.

22 “(2) REVIEW OF APPLICATIONS.—In selecting
23 grant recipients for funding under this section, the
24 Director shall consider, as appropriate to the scale
25 of the proposed effort—

1 “(A) the likelihood of success in under-
2 taking the proposed effort at the institution
3 submitting the application, including the extent
4 to which the faculty, staff, and administrators
5 of the institution are committed to making un-
6 dergraduate STEM education reform a priority
7 of the participating academic unit or units;

8 “(B) the degree to which the proposed ef-
9 fort will contribute to change in institutional
10 culture and policy such that a greater value is
11 placed on faculty engagement in undergraduate
12 education;

13 “(C) the likelihood that the institution will
14 sustain or expand the effort beyond the period
15 of the grant; and

16 “(D) the degree to which the proposed ef-
17 fort will contribute to the systematic accumula-
18 tion of knowledge on STEM education.

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

23 “(4) GRANT DISTRIBUTION.—The Director
24 shall ensure, to the extent practicable, that grants

1 awarded under this section are made to a variety of
2 types of institutions of higher education.”.

3 **SEC. 324. ADVANCED MANUFACTURING EDUCATION.**

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

7 “(b) **ADVANCED MANUFACTURING EDUCATION.**—
8 The Director shall award grants, on a competitive, merit
9 reviewed basis, to community colleges for the development
10 and implementation of innovative advanced manufacturing
11 education reforms to ensure an adequate and well-trained
12 advanced manufacturing workforce. Activities supported
13 by grants under this subsection may include—

14 “(1) the development or expansion of edu-
15 cational materials, courses, curricula, strategies, and
16 methods that will lead to improved advanced manu-
17 facturing degree or certification programs, including
18 the integration of industry standards and workplace
19 competencies into the curriculum;

20 “(2) the development and implementation of
21 faculty professional development programs that en-
22 hance a faculty member’s capabilities and teaching
23 skills in advanced manufacturing, including efforts
24 to understand current advanced manufacturing tech-
25 nologies and practices;

1 “(3) the establishment of centers that provide
2 models and leadership in advanced manufacturing
3 education and serve as regional or national clearing-
4 houses for educational materials and methods, in-
5 cluding in rural areas;

6 “(4) activities to enhance the recruitment and
7 retention of students into certification and degree
8 programs in advanced manufacturing, including the
9 provision of improved mentoring and internship op-
10 portunities;

11 “(5) the establishment of partnerships with pri-
12 vate sector entities to ensure the development of an
13 advanced manufacturing workforce with the skills
14 necessary to meet regional economic needs; and

15 “(6) other activities as determined appropriate
16 by the Director.”.

17 **SEC. 325. STEM EDUCATION PARTNERSHIPS.**

18 Section 9 of the National Science Foundation Au-
19 thorization Act of 2002 (42 U.S.C. 1862n) is amended—

20 (1) in the section heading, by striking “**MATH-**
21 **EMATICS AND SCIENCE**” and inserting “**STEM**”;

22 (2) by striking “mathematics and science” each
23 place it appears in subsections (a) and (b) and in-
24 serting “STEM”;

1 (3) by striking “mathematics or science” each
2 place it appears in subsection (a)(3) and (4)(A) and
3 inserting “STEM”;

4 (4) by striking “mathematics, science, or engi-
5 neering” in subsection (a)(2)(B) and inserting
6 “STEM”;

7 (5) by striking “mathematics, science, and tech-
8 nology” in subsection (a)(3)(B)(ii)(II) and (8) and
9 inserting “STEM”;

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

13 (7) by striking “mathematicians, scientists, and
14 engineers” in subsection (a)(3)(J) and (M) and in-
15 serting “STEM professionals”;

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

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

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

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

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

7 (13) by striking “mathematics, science, engi-
8 neering, and technology” in subsection (b)(1) and
9 (2) and inserting “STEM”; and

10 (14) by striking subsection (d).

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

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

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

17 (2) in subsection (c)—

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

20 (B) in paragraph (3), by—

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

1 (ii) by striking the period at the end
2 of subparagraph (B) and inserting “;
3 and”; and

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

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

9 “(A) offering academic courses leading to
10 a master’s degree and leadership training to
11 prepare individuals to become master teachers
12 in elementary and secondary schools; and

13 “(B) offering programs both during and
14 after matriculation in the program for which
15 the fellowship is received to enable fellows to
16 become highly effective mathematics and
17 science teachers, including mentoring, training,
18 induction, and professional development activi-
19 ties, to fulfill the service requirements of this
20 section, including the requirements of sub-
21 section (e), and to exchange ideas with others
22 in their fields.”;

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

1 (4) by adding after subsection (f) the following
2 new subsection:

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

11 **SEC. 327. INFORMAL STEM EDUCATION.**

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

15 (1) research and development of innovative out-
16 of-school STEM learning and emerging STEM
17 learning environments in order to improve STEM
18 learning outcomes and engagement in STEM; and

19 (2) research that advances the field of informal
20 STEM education.

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

1 (1) research and development that improves our
2 understanding of learning and engagement in infor-
3 mal environments, including the role of informal en-
4 vironments in broadening participation in STEM;
5 and

6 (2) design and testing of innovative STEM
7 learning models, programs, and other resources for
8 informal learning environments to improve STEM
9 learning outcomes and increase engagement for K-
10 12 students, K-12 teachers, and the general public,
11 including design and testing of the scalability of
12 models, programs, and other resources.

13 **SEC. 328. RESEARCH AND DEVELOPMENT TO SUPPORT IM-**
14 **PROVED K-12 LEARNING.**

15 (a) IN GENERAL.—The Director, acting through the
16 Directorate for Education and Human Resources, shall
17 award competitive, merit-reviewed grants to support re-
18 search and development on alignment, implementation,
19 impact, and ongoing improvement of standards and equiv-
20 alent learning expectations used by States in mathematics,
21 science, and, as appropriate, other State-based STEM
22 standards.

23 (b) RESEARCH AREAS.—In making awards under
24 this section, the Director shall consider proposals for re-

1 search and development, including, as appropriate, large-
2 scale research and development, of—

3 (1) resources, including virtual resources such
4 as web portals, for content, professional develop-
5 ment, and research results;

6 (2) teacher education and professional develop-
7 ment;

8 (3) learning progressions;

9 (4) assessments;

10 (5) metrics for evaluating the impact of stand-
11 ards; and

12 (6) other areas of research and development
13 that are likely to contribute to the alignment, imple-
14 mentation, impact, and ongoing improvement of
15 standards in STEM subjects.

16 **TITLE IV—NATIONAL INSTITUTE**
17 **OF STANDARDS AND TECH-**
18 **NOLOGY**

19 **SEC. 401. SHORT TITLE.**

20 This title may be cited as the “National Institute of
21 Standards and Technology Authorization Act of 2015”.

22 **SEC. 402. AUTHORIZATION OF APPROPRIATIONS.**

23 (a) FISCAL YEAR 2016.—

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

1 \$1,119,700,000 for the National Institute of Stand-
2 ards and Technology for fiscal year 2016.

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

5 (A) \$754,700,000 shall be authorized for
6 scientific and technical research and services
7 laboratory activities;

8 (B) \$59,000,000 shall be authorized for
9 the construction and maintenance of facilities;
10 and

11 (C) \$306,000,000 shall be authorized for
12 industrial technology services activities, of
13 which—

14 (i) \$141,000,000 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) \$150,000,000 shall be authorized
25 for the Network for Manufacturing Inno-

1 vation Program established under section
2 34 of such Act (15 U.S.C. 278s).

3 (b) FISCAL YEAR 2017.—

4 (1) IN GENERAL.—There are authorized to be
5 appropriated to the Secretary of Commerce
6 \$1,484,390,000 for the National Institute of Stand-
7 ards and Technology for fiscal year 2017.

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

10 (A) \$792,440,000 shall be authorized for
11 scientific and technical research and services
12 laboratory activities;

13 (B) \$61,950,000 shall be authorized for
14 the construction and maintenance of facilities;
15 and

16 (C) \$320,000,000 shall be authorized for
17 industrial technology services activities, of
18 which—

19 (i) \$160,000,000 shall be authorized
20 for the Hollings Manufacturing Extension
21 Partnership under section 25 of the Na-
22 tional Institute of Standards and Tech-
23 nology Act (15 U.S.C. 278k) and the pro-
24 gram under section 26 of such Act (15
25 U.S.C. 278l), of which not more than

1 \$20,000,000 shall be for the competitive
2 grant program under section 25(f) of such
3 Act; and

4 (ii) \$150,000,000 shall be authorized
5 for the Network for Manufacturing Inno-
6 vation Program established under section
7 34 of such Act (15 U.S.C. 278s).

8 (c) FISCAL YEAR 2018.—

9 (1) IN GENERAL.—There are authorized to be
10 appropriated to the Secretary of Commerce
11 \$1,517,100,000 for the National Institute of Stand-
12 ards and Technology for fiscal year 2018.

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

15 (A) \$832,060,000 shall be authorized for
16 scientific and technical research and services
17 laboratory activities;

18 (B) \$65,050,000 shall be authorized for
19 the construction and maintenance of facilities;
20 and

21 (C) \$310,000,000 shall be authorized for
22 industrial technology services activities, of
23 which—

24 (i) \$160,000,000 shall be authorized
25 for the Hollings Manufacturing Extension

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

9 (ii) \$150,000,000 shall be authorized
10 for the Network for Manufacturing Inno-
11 vation Program established under section
12 34 of such Act (15 U.S.C. 278s).

13 (d) FISCAL YEAR 2019.—

14 (1) IN GENERAL.—There are authorized to be
15 appropriated to the Secretary of Commerce
16 \$1,561,960,000 for the National Institute of Stand-
17 ards and Technology for fiscal year 2019.

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

20 (A) \$873,660,000 shall be authorized for
21 scientific and technical research and services
22 laboratory activities;

23 (B) \$68,300,000 shall be authorized for
24 the construction and maintenance of facilities;
25 and

1 (C) \$310,000,000 shall be authorized for
2 industrial technology services activities, of
3 which—

4 (i) \$160,000,000 shall be authorized
5 for the Hollings Manufacturing Extension
6 Partnership under section 25 of the Na-
7 tional Institute of Standards and Tech-
8 nology Act (15 U.S.C. 278k) and the pro-
9 gram under section 26 of such Act (15
10 U.S.C. 278l), of which not more than
11 \$20,000,000 shall be for the competitive
12 grant program under section 25(f) of such
13 Act; and

14 (ii) \$150,000,000 shall be authorized
15 for the Network for Manufacturing Inno-
16 vation Program established under section
17 34 of such Act (15 U.S.C. 278s).

18 (e) FISCAL YEAR 2020.—

19 (1) IN GENERAL.—There are authorized to be
20 appropriated to the Secretary of Commerce
21 \$1,609,060,000 for the National Institute of Stand-
22 ards and Technology for fiscal year 2020.

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

1 (A) \$917,340,000 shall be authorized for
2 scientific and technical research and services
3 laboratory activities;

4 (B) \$71,710,000 shall be authorized for
5 the construction and maintenance of facilities;
6 and

7 (C) \$310,000,000 shall be authorized for
8 industrial technology services activities, of
9 which—

10 (i) \$160,000,000 shall be authorized
11 for the Hollings Manufacturing Extension
12 Partnership under section 25 of the Na-
13 tional Institute of Standards and Tech-
14 nology Act (15 U.S.C. 278k) and the pro-
15 gram under section 26 of such Act (15
16 U.S.C. 278l), of which not more than
17 \$20,000,000 shall be for the competitive
18 grant program under section 25(f) of such
19 Act; and

20 (ii) \$150,000,000 shall be authorized
21 for the Network for Manufacturing Inno-
22 vation Program established under section
23 34 of such Act (15 U.S.C. 278s).

1 **SEC. 403. HOLLINGS MANUFACTURING EXTENSION PART-**
2 **NERSHIP.**

3 Section 25 of the National Institute of Standards and
4 Technology Act (15 U.S.C. 278k) is amended to read as
5 follows:

6 **“SEC. 25. HOLLINGS MANUFACTURING EXTENSION PART-**
7 **NERSHIP.**

8 “(a) ESTABLISHMENT AND PURPOSE.—

9 “(1) IN GENERAL.—The Secretary, through the
10 Director shall provide assistance for the creation and
11 support of regional manufacturing extension centers
12 for the transfer of manufacturing technology and
13 best business practices. These centers shall be
14 known as the ‘Hollings Manufacturing Extension
15 Centers’ (in this Act referred to as the ‘Centers’).
16 The program under this section shall be known as
17 the ‘Hollings Manufacturing Extension Partnership’.

18 “(2) AFFILIATIONS.—Such Centers shall be af-
19 filiated with any United States-based public or non-
20 profit institution or organization, or group thereof,
21 that applies for and is awarded financial assistance
22 under this section.

23 “(3) OBJECTIVE.—The objective of the pro-
24 gram is to enhance productivity, competitiveness,
25 and technological performance in United States
26 manufacturing through—

1 “(A) the transfer of manufacturing tech-
2 nology and techniques to Centers and, through
3 them, to manufacturing companies throughout
4 the United States;

5 “(B) the participation of individuals from
6 industry, institutions of higher education, State
7 governments, other Federal agencies, and, when
8 appropriate, the Institute in cooperative tech-
9 nology transfer activities;

10 “(C) efforts to make new manufacturing
11 technology and processes usable by United
12 States-based small and medium-sized compa-
13 nies;

14 “(D) the active dissemination of scientific,
15 engineering, technical, and management infor-
16 mation about manufacturing to industrial firms,
17 including small and medium-sized manufac-
18 turing companies;

19 “(E) the development of new partnerships,
20 networks, and services that will assist small and
21 medium-sized manufacturing companies expand
22 into new markets, including global markets;

23 “(F) the utilization, when appropriate, of
24 the expertise and capability that exists in Fed-
25 eral laboratories other than the Institute; and

1 “(G) the provision to community colleges
2 and area career and technical education schools
3 of information about the job skills needed in
4 small and medium-sized manufacturing busi-
5 nesses in the regions they serve.

6 “(b) ACTIVITIES.—The activities of the Centers shall
7 include—

8 “(1) the establishment of automated manufac-
9 turing systems and other advanced production tech-
10 nologies, based on research by the Institute and
11 other entities, for the purpose of demonstrations and
12 technology transfer;

13 “(2) assistance to Federal agencies in sup-
14 porting United States-based manufacturing by iden-
15 tifying and providing technical assistance to small
16 and medium-sized manufacturers to help them meet
17 Federal agency procurement and acquisition needs;

18 “(3) the active transfer and dissemination of re-
19 search findings and Center expertise to a wide range
20 of companies and enterprises, particularly small and
21 medium-sized manufacturers; and

22 “(4) the facilitation of collaborations and part-
23 nerships between small and medium-sized manufac-
24 turing companies and community colleges and area
25 career and technical education schools to help such

1 colleges and schools better understand the specific
2 needs of manufacturers and to help manufacturers
3 better understand the skill sets that students learn
4 in the programs offered by such colleges and schools.

5 “(c) FINANCIAL ASSISTANCE AND REQUIRE-
6 MENTS.—

7 “(1) FINANCIAL SUPPORT.—The Secretary may
8 provide financial support to any Center created
9 under subsection (a) for an initial period of 5 years,
10 which may be renewed for an additional 5-year pe-
11 riod. The Secretary may provide to a Center up to
12 50 percent of the capital and annual operating and
13 maintenance funds required to create and maintain
14 such Center.

15 “(2) REGULATIONS.—The Secretary shall im-
16 plement, review, and update the sections of the Code
17 of Federal Regulations related to this section at
18 least once every 5 years.

19 “(3) APPLICATION.—

20 “(A) IN GENERAL.—Any public or non-
21 profit institution, or consortium thereof, may
22 submit to the Secretary an application for fi-
23 nancial support under this section, in accord-
24 ance with the procedures established by the
25 Secretary.

1 “(B) COST-SHARING.—In order to receive
2 assistance under this section, an applicant for
3 financial assistance under subparagraph (A)
4 shall provide adequate assurances that non-
5 Federal assets obtained from the applicant and
6 the applicant’s partnering organizations will be
7 used as a funding source to meet not less than
8 50 percent of the costs incurred. For purposes
9 of the preceding sentence, the costs incurred
10 means the costs incurred in connection with the
11 activities undertaken to improve the manage-
12 ment, productivity, competitiveness, and techno-
13 logical performance of small and medium-sized
14 manufacturing companies.

15 “(C) AGREEMENTS WITH OTHER ENTI-
16 TIES.—In meeting the 50-percent requirement,
17 it is anticipated that a Center will enter into
18 agreements with other entities such as private
19 industry, institutions of higher education, and
20 State governments to accomplish programmatic
21 objectives and access new and existing resources
22 that will further the impact of the Federal in-
23 vestment made on behalf of small and medium-
24 sized manufacturing companies.

1 “(D) LEGAL RIGHTS.—Each applicant
2 under subparagraph (A) shall submit a proposal
3 for the allocation of the legal rights associated
4 with any invention that may result from the
5 proposed Center’s activities.

6 “(4) MERIT REVIEW.—The Secretary shall sub-
7 ject each such application to merit review. In mak-
8 ing a decision whether to approve such application
9 and provide financial support under this section, the
10 Secretary shall consider, at a minimum, the fol-
11 lowing:

12 “(A) The merits of the application, par-
13 ticularly those portions of the application re-
14 garding technology transfer, training and edu-
15 cation, and adaptation of manufacturing tech-
16 nologies to the needs of particular industrial
17 sectors.

18 “(B) The quality of service to be provided.

19 “(C) Geographical diversity and extent of
20 service area.

21 “(D) The percentage of funding and
22 amount of in-kind commitment from other
23 sources.

24 “(5) EVALUATION.—

1 “(A) IN GENERAL.—Each Center that re-
2 ceives financial assistance under this section
3 shall be evaluated during its third year of oper-
4 ation by an evaluation panel appointed by the
5 Secretary.

6 “(B) COMPOSITION.—Each such evalua-
7 tion panel shall be composed of independent ex-
8 perts, none of whom shall be connected with the
9 involved Center, and Federal officials.

10 “(C) CHAIR.—An official of the Institute
11 shall chair the panel.

12 “(D) PERFORMANCE MEASUREMENT.—
13 Each evaluation panel shall measure the in-
14 volved Center’s performance against the objec-
15 tives specified in this section.

16 “(E) POSITIVE EVALUATION.—If the eval-
17 uation is positive, the Secretary may provide
18 continued funding through the fifth year.

19 “(F) CORRECTIVE ACTION PLAN.—The
20 Secretary may not provide funding for the re-
21 maining years of a Center’s operation unless
22 the evaluation is positive. A Center that has not
23 received a positive evaluation by the evaluation
24 panel shall be notified by the panel of the defi-
25 ciencies in its performance and shall be placed

1 on a corrective action plan and provided the op-
2 portunity to address deficiencies unless imme-
3 diate action is necessary to protect the public
4 interest. The program shall re-evaluate the Cen-
5 ter within one year and if the Center has not
6 addressed the deficiencies identified by the
7 panel, or shown a significant improvement in its
8 performance, the Director shall conduct a new
9 competition or may close the Center.

10 “(G) ADDITIONAL FINANCIAL SUPPORT.—
11 After the fifth year, a Center may receive addi-
12 tional financial support under this section if it
13 has received a positive evaluation through an
14 independent review, under procedures estab-
15 lished by the Institute.

16 “(H) RECOMPETITION.—If a Center has
17 received financial support for 10 consecutive
18 years, the Director shall conduct a new com-
19 petition. An existing Center may submit an ap-
20 plication as part of the new competition.

21 “(I) RECOMPETITION PLAN.—Not later
22 than 180 days after the date of enactment of
23 the America Competes Reauthorization Act of
24 2015, the Director shall submit a plan to the
25 Committee on Science, Space, and Technology

1 of the House of Representatives and the Com-
2 mittee on Commerce, Science, and Transpor-
3 tation of the Senate detailing how the program
4 will implement the new competitions required
5 under subparagraph (H). The Director shall
6 consult with the MEP Advisory Board estab-
7 lished under subsection (f) in the development
8 and implementation of the plan.

9 “(6) OVERSIGHT BOARD.—

10 “(A) IN GENERAL.—Each Center that re-
11 ceives financial assistance under this section
12 shall establish an oversight board that is broad-
13 ly representative of regional stakeholders with a
14 majority of board members drawn from local
15 small and medium-sized manufacturing firms.

16 “(B) BYLAWS AND CONFLICT OF INTER-
17 EST.—Each board under subparagraph (A)
18 shall adopt and submit to the Director bylaws
19 to govern the operation of the board, including
20 a conflict of interest policy to ensure relevant
21 relationships are disclosed and proper recusal
22 procedures are in place.

23 “(C) LIMITATION.—Board members may
24 not serve simultaneously on more than one Cen-

1 ter’s oversight board or serve as a contractor
2 providing services to a Center.

3 “(7) PROTECTION OF CONFIDENTIAL INFORMA-
4 TION.—The Secretary shall ensure that the following
5 are not publically disclosed:

6 “(A) Confidential information on the busi-
7 ness operations of—

8 “(i) a participant under the program;
9 or

10 “(ii) a client of a Center.

11 “(B) Trade secrets possessed by any client
12 of a Center.

13 “(8) PATENT RIGHTS.—The provisions of chap-
14 ter 18 of title 35, United States Code, shall apply,
15 to the extent not inconsistent with this section, to
16 the promotion of technology from research by Cen-
17 ters under this section except for contracts for such
18 specific technology extension or transfer services as
19 may be specified by statute or by the Director.

20 “(d) REPORTING AND AUDITING REQUIREMENTS.—
21 The Director shall establish procedures regarding Center
22 financial reporting and auditing to ensure that awards are
23 used for the purposes specified in this section and are in
24 accordance with sound accounting practices.

25 “(e) ACCEPTANCE OF FUNDS.—

1 “(1) IN GENERAL.—In addition to such sums
2 as may be appropriated to the Secretary and Direc-
3 tor to operate the Hollings Manufacturing Extension
4 Partnership, the Secretary and Director also may
5 accept funds from other Federal departments and
6 agencies and, under section 2(c)(7), from the private
7 sector for the purpose of strengthening United
8 States manufacturing.

9 “(2) ALLOCATION OF FUNDS.—

10 “(A) FUNDS ACCEPTED FROM OTHER FED-
11 ERAL DEPARTMENTS OR AGENCIES.—The Di-
12 rector shall determine whether funds accepted
13 from other Federal departments or agencies
14 shall be counted in the calculation of the Fed-
15 eral share of capital and annual operating and
16 maintenance costs under subsection (c).

17 “(B) FUNDS ACCEPTED FROM THE PRI-
18 VATE SECTOR.—Funds accepted from the pri-
19 vate sector under section 2(c)(7), if allocated to
20 a Center, may not be considered in the calcula-
21 tion of the Federal share under subsection (c)
22 of this section.

23 “(f) MEP ADVISORY BOARD.—

24 “(1) ESTABLISHMENT.—There is established
25 within the Institute a Manufacturing Extension

1 Partnership Advisory Board (in this subsection re-
2 ferred to as the ‘MEP Advisory Board’).

3 “(2) MEMBERSHIP.—

4 “(A) IN GENERAL.—The MEP Advisory
5 Board shall consist of not fewer than 10 mem-
6 bers broadly representative of stakeholders, to
7 be appointed by the Director. At least 2 mem-
8 bers shall be employed by or on an advisory
9 board for the Centers, at least 1 member shall
10 represent a community college, and at least 5
11 other members shall be from United States
12 small businesses in the manufacturing sector.
13 No member shall be an employee of the Federal
14 Government.

15 “(B) TERM.—Except as provided in sub-
16 paragraph (C) or (D), the term of office of each
17 member of the MEP Advisory Board shall be 3
18 years.

19 “(C) VACANCIES.—Any member appointed
20 to fill a vacancy occurring prior to the expira-
21 tion of the term for which his predecessor was
22 appointed shall be appointed for the remainder
23 of such term.

24 “(D) SERVING CONSECUTIVE TERMS.—
25 Any person who has completed two consecutive

1 full terms of service on the MEP Advisory
2 Board shall thereafter be ineligible for appoint-
3 ment during the one-year period following the
4 expiration of the second such term.

5 “(3) MEETINGS.—The MEP Advisory Board
6 shall meet not less than 2 times annually and shall
7 provide to the Director—

8 “(A) advice on Hollings Manufacturing
9 Extension Partnership programs, plans, and
10 policies;

11 “(B) assessments of the soundness of Hol-
12 lings Manufacturing Extension Partnership
13 plans and strategies; and

14 “(C) assessments of current performance
15 against Hollings Manufacturing Extension
16 Partnership program plans.

17 “(4) FEDERAL ADVISORY COMMITTEE ACT AP-
18 PPLICABILITY.—

19 “(A) IN GENERAL.—In discharging its du-
20 ties under this subsection, the MEP Advisory
21 Board shall function solely in an advisory ca-
22 pacity, in accordance with the Federal Advisory
23 Committee Act.

1 “(B) EXCEPTION.—Section 14 of the Fed-
2 eral Advisory Committee Act shall not apply to
3 the MEP Advisory Board.

4 “(5) REPORT.—The MEP Advisory Board shall
5 transmit an annual report to the Secretary for
6 transmittal to Congress within 30 days after the
7 submission to Congress of the President’s annual
8 budget request in each year. Such report shall ad-
9 dress the status of the program established pursuant
10 to this section and comment on the relevant sections
11 of the programmatic planning document and updates
12 thereto transmitted to Congress by the Director
13 under subsections (c) and (d) of section 23.

14 “(g) COMPETITIVE GRANT PROGRAM.—

15 “(1) ESTABLISHMENT.—The Director shall es-
16 tablish, within the Hollings Manufacturing Exten-
17 sion Partnership, a program of competitive awards
18 among participants described in paragraph (2) for
19 the purposes described in paragraph (3).

20 “(2) PARTICIPANTS.—Participants receiving
21 awards under this subsection shall be the Centers, or
22 a consortium of such Centers.

23 “(3) PURPOSE.—The purpose of the program
24 under this subsection is to add capabilities to the
25 Hollings Manufacturing Extension Partnership, in-

1 including the development of projects to solve new or
2 emerging manufacturing problems as determined by
3 the Director, in consultation with the Director of the
4 Hollings Manufacturing Extension Partnership, the
5 MEP Advisory Board, and small and medium-sized
6 manufacturers.

7 “(4) THEMES.—One or more themes for the
8 competition may be identified, which may vary from
9 year to year, depending on the needs of manufactur-
10 ers and the success of previous competitions. These
11 themes may include—

12 “(A) supply chain integration and quality
13 management;

14 “(B) the creation of partnerships to en-
15 courage the development of a workforce with
16 the skills necessary to meet the needs of a re-
17 gion, including the creation of apprenticeship
18 opportunities and the adoption of universally
19 recognized credential programs, as appropriate;

20 “(C) energy efficiency, including efficient
21 building technologies and environmentally
22 friendly materials, products, and processes;

23 “(D) enhancing the competitiveness of
24 small and medium-sized manufacturers in the
25 global marketplace;

1 “(E) the transfer of technology based on
2 the technological needs of manufacturers and
3 available technologies from institutions of high-
4 er education, laboratories, and other technology
5 producing entities; and

6 “(F) areas that extend beyond traditional
7 areas of manufacturing extension activities, in-
8 cluding projects related to construction industry
9 modernization.

10 “(5) REIMBURSEMENT.—Centers may be reim-
11 bursed for costs incurred under the program under
12 this subsection.

13 “(6) APPLICATIONS.—Applications for awards
14 under this subsection shall be submitted in such
15 manner, at such time, and containing such informa-
16 tion as the Director shall require, in consultation
17 with the MEP Advisory Board.

18 “(7) SELECTION.—Awards under this sub-
19 section shall be peer reviewed and competitively
20 awarded. The Director shall endeavor to have broad
21 geographic diversity among selected proposals. The
22 Director shall select proposals to receive awards that
23 will—

1 “(A) utilize innovative or collaborative ap-
2 proaches to solving the problem described in the
3 competition;

4 “(B) improve the competitiveness of indus-
5 tries in the region in which the Center or Cen-
6 ters are located; and

7 “(C) contribute to the long-term economic
8 stability of that region, including the creation of
9 jobs or training employees.

10 “(8) PROGRAM CONTRIBUTION.—Recipients of
11 awards under this subsection shall not be required
12 to provide a matching contribution.

13 “(9) DURATION.—Awards under this subsection
14 shall last no longer than 5 years.

15 “(h) INNOVATIVE SERVICES INITIATIVE.—

16 “(1) ESTABLISHMENT.—The Director, in co-
17 ordination with the Advanced Manufacturing Office
18 of the Department of Energy, shall establish, within
19 the Hollings Manufacturing Extension Partnership,
20 an innovative services initiative to assist small and
21 medium-sized manufacturers in—

22 “(A) reducing their energy usage, green-
23 house gas emissions, and environmental waste
24 to improve profitability;

1 “(B) accelerating the domestic commer-
2 cialization of new product technologies, includ-
3 ing components for renewable energy and en-
4 ergy efficiency systems; and

5 “(C) identifying and diversifying to new
6 markets, including support for transitioning to
7 the production of components for renewable en-
8 ergy and energy efficiency systems.

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

15 “(i) EXPORT ASSISTANCE TO SMALL AND MEDIUM-
16 SIZED MANUFACTURERS.—

17 “(1) IN GENERAL.—The Director shall—

18 “(A) evaluate obstacles that are unique to
19 small and medium-sized manufacturers that
20 prevent such manufacturers from effectively
21 competing in the global market;

22 “(B) implement a comprehensive export
23 assistance initiative through the Centers to help
24 small and medium-sized manufacturers address
25 such obstacles; and

1 “(C) to the maximum extent practicable,
2 ensure that the activities carried out under this
3 subsection are coordinated with, and do not du-
4 plicate the efforts of, other export assistance
5 programs within the Federal Government.

6 “(2) REQUIREMENTS.—The initiative shall in-
7 clude—

8 “(A) export assistance counseling;

9 “(B) the development of partnerships that
10 will provide small and medium-sized manufac-
11 turers with greater access to and knowledge of
12 global markets; and

13 “(C) improved communication between the
14 Centers to assist such manufacturers in imple-
15 menting appropriate, targeted solutions to such
16 obstacles.

17 “(j) DEFINITIONS.—In this section:

18 “(1) AREA CAREER AND TECHNICAL EDU-
19 CATION SCHOOL.—The term ‘area career and tech-
20 nical education school’ has the meaning given such
21 term in section 3 of the Carl D. Perkins Career and
22 Technical Education Improvement Act of 2006 (20
23 U.S.C. 2302).

24 “(2) COMMUNITY COLLEGE.—The term ‘com-
25 munity college’ means an institution of higher edu-

1 cation (as defined under section 101(a) of the High-
2 er Education Act of 1965 (20 U.S.C. 1001(a))) at
3 which the highest degree that is predominately
4 awarded to students is an associate's degree.”.

5 **SEC. 404. NATIONAL ACADEMIES REVIEW.**

6 Not later than 6 months after the date of enactment
7 of this Act, the Director of the National Institute of
8 Standards and Technology shall enter into a contract with
9 the National Academies to conduct a single, comprehen-
10 sive review of the Institute's laboratory programs. The re-
11 view shall—

12 (1) assess the technical merits and scientific
13 caliber of the research conducted at the laboratories;

14 (2) examine the strengths and weaknesses of
15 the 2010 laboratory reorganization on the Institute's
16 ability to fulfill its mission;

17 (3) evaluate how cross-cutting research and de-
18 velopment activities are planned, coordinated, and
19 executed across the laboratories; and

20 (4) assess how the laboratories are engaging in-
21 dustry, including the incorporation of industry need,
22 into the research goals and objectives of the Insti-
23 tute.

1 **SEC. 405. IMPROVING NIST COLLABORATION WITH OTHER**
2 **AGENCIES.**

3 Section 8 of the National Bureau of Standards Au-
4 thorization Act for Fiscal Year 1983 (15 U.S.C. 275b)
5 is amended—

6 (1) in the section heading, by inserting “AND
7 WITH” after “PERFORMED FOR”; and

8 (2) by adding at the end the following: “The
9 Secretary may accept, apply for, use, and spend
10 Federal, State, and non-governmental acquisition
11 and assistance funds to further the mission of the
12 Institute without regard to the source or the period
13 of availability of these funds as well as share per-
14 sonnel, associates, facilities, and property with these
15 partner organizations, with or without reimburse-
16 ment, upon mutual agreement.”.

17 **SEC. 406. MISCELLANEOUS PROVISIONS.**

18 (a) **FUNCTIONS AND ACTIVITIES.**—Section 15 of the
19 of the National Institute of Standards and Technology Act
20 (15 U.S.C. 278e) is amended—

21 (1) by striking “of the Government; and” and
22 inserting “of the Government;”;

23 (2) by striking “transportation services for em-
24 ployees of the Institute” and inserting “transpor-
25 tation services for employees, associates, or fellows
26 of the Institute”; and

1 (3) by striking “Code.” and inserting “Code;
2 and (i) the protection of Institute buildings and
3 other plant facilities, equipment, and property, and
4 of employees, associates, visitors, or other persons
5 located therein or associated therewith, notwith-
6 standing any other provision of law.”.

7 (b) POST-DOCTORAL FELLOWSHIP PROGRAM.—Sec-
8 tion 19 of the National Institute of Standards and Tech-
9 nology Act (15 U.S.C. 278g–2) is amended to read as fol-
10 lows:

11 **“SEC. 19. POST-DOCTORAL FELLOWSHIP PROGRAM.**

12 “The Director, in conjunction with the National
13 Academy of Sciences, shall establish and conduct a post-
14 doctoral fellowship program that shall include not less
15 than 20 new fellows per fiscal year. In evaluating applica-
16 tions for fellowships under this section, the Director shall
17 give consideration to the goal of promoting the participa-
18 tion of underrepresented minorities in research areas sup-
19 ported by the Institute.”.

20 **TITLE V—INNOVATION**

21 **SEC. 501. OFFICE OF INNOVATION AND ENTREPRENEUR-**
22 **SHIP.**

23 Section 25 of the Stevenson-Wydler Technology Inno-
24 vation Act of 1980 (15 U.S.C. 3720) is amended—

1 (1) in subsection (a) by inserting “with a Direc-
2 tor and full-time staff” after “Office of Innovation
3 and Entrepreneurship”;

4 (2) in subsection (b)—

5 (A) by amending paragraph (3) to read as
6 follows:

7 “(3) providing access to relevant data, research,
8 and technical assistance on innovation and commer-
9 cialization, including best practices for university-
10 based incubators and accelerators;”;

11 (B) by redesignating paragraphs (4) and
12 (5) as paragraphs (6) and (7), respectively; and

13 (C) by inserting the following after para-
14 graph (3):

15 “(4) overseeing the implementation of the loan
16 guarantee programs and the Regional Innovation
17 Program established under sections 26 and 27, re-
18 spectively;

19 “(5) developing, within 180 days after the date
20 of enactment of the America Competes Reauthoriza-
21 tion Act of 2015, and updating at least every 5
22 years, a strategic plan to guide the activities of the
23 Office of Innovation and Entrepreneurship that
24 shall—

1 “(A) specify and prioritize near-term and
2 long-term goals, objectives, and policies to ac-
3 celerate innovation and advance the commer-
4 cialization of research and development, includ-
5 ing federally funded research and development,
6 set forth the anticipated time for achieving the
7 objectives, and identify metrics for use in as-
8 sessing progress toward such objectives;

9 “(B) describe how the Department of
10 Commerce is working in conjunction with other
11 Federal agencies to foster innovation and com-
12 mercialization across the United States; and

13 “(C) provide a summary of the activities,
14 including the development of metrics to evalu-
15 ate regional innovation strategies undertaken
16 through the Regional Innovation Research and
17 Information Program established under section
18 27(e);”;

19 (3) by amending subsection (c) to read as fol-
20 lows:

21 “(c) ADVISORY COMMITTEE.—

22 “(1) ESTABLISHMENT.—The Secretary shall es-
23 tablish or designate an advisory committee, which
24 shall meet at least twice each fiscal year, to provide
25 advice to the Secretary on carrying out the duties

1 and responsibilities of the Office of Innovation and
2 Entrepreneurship.

3 “(2) REPORT TO CONGRESS.—The advisory
4 committee shall prepare a report, to be submitted to
5 the Committee on Science, Space, and Technology of
6 the House of Representatives and the Committee on
7 Commerce, Science, and Transportation of the Sen-
8 ate every 3 years. The first report shall be submitted
9 not later than 1 year after the date of enactment of
10 the America Competes Reauthorization Act of 2015
11 and shall include—

12 “(A) an assessment of the strategic plan
13 developed under subsection (b)(5) and the
14 progress made in implementing the plan and
15 the duties of the Office of Innovation and En-
16 trepreneurship;

17 “(B) an assessment of how the Office of
18 Innovation and Entrepreneurship is working
19 with other Federal agencies to meet the goals
20 and duties of the office; and

21 “(C) any recommendations for how the Of-
22 fice of Innovation and Entrepreneurship could
23 be improved.”; and

24 (4) by adding at the end the following:

1 “(d) AUTHORIZATION OF APPROPRIATIONS.—There
2 are authorized to be appropriated to the Secretary
3 \$5,000,000 for each of fiscal years 2016 through 2020
4 to carry out this section.”.

5 **SEC. 502. FEDERAL LOAN GUARANTEES FOR INNOVATIVE**
6 **TECHNOLOGIES IN MANUFACTURING.**

7 Section 26(t) of the Stevenson-Wydler Technology
8 Innovation Act of 1980 (15 U.S.C. 3721(t)) is amended
9 by striking “fiscal years 2011 through 2013” and insert-
10 ing “fiscal years 2016 through 2020”.

11 **SEC. 503. INNOVATION VOUCHER PILOT PROGRAM.**

12 Section 25 of the Stevenson-Wydler Technology Inno-
13 vation Act of 1980 (15 U.S.C. 3720) as amended by sec-
14 tion 501 of this Act, is further amended by adding at the
15 end the following:

16 “(e) INNOVATION VOUCHER PILOT PROGRAM.—

17 “(1) IN GENERAL.—The Secretary, acting
18 through the Office of Innovation and Entrepreneur-
19 ship and in conjunction with the States, shall estab-
20 lish an innovation voucher pilot program to accel-
21 erate innovative activities and enhance the competi-
22 tiveness of small and medium-sized manufacturers in
23 the United States. The pilot program shall—

1 “(A) foster collaborations between small
2 and medium-sized manufacturers and research
3 institutions; and

4 “(B) enable small and medium-sized man-
5 ufacturers to access technical expertise and ca-
6 pabilities that will lead to the development of
7 innovative products or manufacturing processes,
8 including through—

9 “(i) research and development, includ-
10 ing proof of concept, technical develop-
11 ment, and compliance testing activities;

12 “(ii) early-stage product development,
13 including engineering design services; and

14 “(iii) technology transfer and related
15 activities.

16 “(2) AWARD SIZE.—The Secretary shall com-
17 petitively award vouchers worth up to \$20,000 to
18 small and medium-sized manufacturers for use at el-
19 igible research institutions to acquire the services de-
20 scribed in paragraph (1)(B).

21 “(3) STREAMLINED PROCEDURES.—The Sec-
22 retary shall streamline and simplify the application,
23 administrative, and reporting procedures for vouch-
24 ers administered under the program.

1 “(4) REGULATIONS.—Prior to awarding any
2 vouchers under the program, the Secretary shall pro-
3 mulgate regulations—

4 “(A) establishing criteria for the selection
5 of recipients of awards under this subsection;

6 “(B) establishing procedures regarding fi-
7 nancial reporting and auditing—

8 “(i) to ensure that awards are used
9 for the purposes of the program; and

10 “(ii) that are in accordance with
11 sound accounting practices; and

12 “(C) describing any other policies, proce-
13 dures, or information necessary to implement
14 this subsection, including those intended to
15 streamline and simplify the program in accord-
16 ance with paragraph (3).

17 “(5) TRANSFER AUTHORITY.—The Secretary
18 may transfer funds appropriated to the Department
19 of Commerce to other Federal agencies for the per-
20 formance of services authorized under this sub-
21 section.

22 “(6) ADMINISTRATIVE COSTS.—All of the
23 amounts appropriated to carry out this subsection
24 for a fiscal year shall be used for vouchers awarded
25 under this subsection, except that the Secretary may

1 set aside a percentage of such amounts for eligible
2 research institutions performing the services de-
3 scribed in paragraph (1)(B) to defray administrative
4 costs associated with the services. The Secretary
5 shall establish a single, fixed percentage for such
6 purposes that will apply to all eligible research insti-
7 tutions.

8 “(7) OUTREACH.—The Secretary may use cen-
9 ters established under section 25 of the National In-
10 stitute of Standards and Technology Act (15 U.S.C.
11 278k) to provide information about the program es-
12 tablished under this subsection and to conduct out-
13 reach to potential applicants, as appropriate.

14 “(8) REPORTS TO CONGRESS.—

15 “(A) PLAN.—Not later than 180 days
16 after the date of enactment of the America
17 Competes Reauthorization Act of 2015, the
18 Secretary shall transmit to Congress a plan
19 that will serve as a guide for the activities of
20 the program. The plan shall include a descrip-
21 tion of the specific objectives of the program
22 and the metrics that will be used in assessing
23 progress toward those objectives.

24 “(B) OUTCOMES.—Not later than 3 years
25 after the date of enactment of the America

1 Competes Reauthorization Act of 2015, the
2 Secretary shall transmit to Congress a report
3 containing—

4 “(i) a summary of the activities car-
5 ried out under this subsection;

6 “(ii) an assessment of the impact of
7 such activities on the innovative capacity of
8 small and medium-sized manufacturers re-
9 ceiving assistance under the pilot program;
10 and

11 “(iii) any recommendations for admin-
12 istrative and legislative action that could
13 optimize the effectiveness of the pilot pro-
14 gram.

15 “(9) COORDINATION AND NONDUPLICATION.—
16 To the maximum extent practicable, the Secretary
17 shall ensure that the activities carried out under this
18 subsection are coordinated with, and do not dupli-
19 cate the efforts of, other programs within the Fed-
20 eral Government.

21 “(10) ELIGIBLE RESEARCH INSTITUTIONS DE-
22 FINED.—For the purposes of this subsection, the
23 term ‘eligible research institution’ means—

24 “(A) an institution of higher education, as
25 such term is defined in section 101(a) of the

1 Higher Education Act of 1965 (20 U.S.C.
2 1001(a));

3 “(B) a Federal laboratory;

4 “(C) a federally funded research and devel-
5 opment center; or

6 “(D) a Hollings Manufacturing Extension
7 Center established under section 25 of the Na-
8 tional Institute of Standards and Technology
9 Act (15 U.S.C. 278k).

10 “(11) AUTHORIZATION OF APPROPRIATIONS.—

11 There are authorized to be appropriated to the Sec-
12 retary to carry out the pilot program in this sub-
13 section \$5,000,000 for each of fiscal years 2016
14 through 2020.”.

15 **SEC. 504. FEDERAL ACCELERATION OF STATE TECH-**
16 **NOLOGY COMMERCIALIZATION PILOT PRO-**
17 **GRAM.**

18 The Stevenson-Wydler Technology Innovation Act of
19 1980 (15 U.S.C. 3701 et seq.) is amended by adding at
20 the end the following:

21 **“SEC. 28. FEDERAL ACCELERATION OF STATE TECH-**
22 **NOLOGY COMMERCIALIZATION PILOT PRO-**
23 **GRAM.**

24 “(a) AUTHORITY.—

1 “(1) ESTABLISHMENT.—The Secretary shall es-
2 tablish a Federal Acceleration of State Technology
3 Commercialization Pilot Program or FAST Com-
4 mercialization Pilot Program to award grants to
5 States, or consortia thereof, for the purposes de-
6 scribed in paragraph (2). Awards under this section
7 shall be made through a competitive, merit-based
8 process.

9 “(2) PURPOSE.—The purpose of the program
10 under this section is to advance United States pro-
11 ductivity and global competitiveness by accelerating
12 commercialization of innovative technology by
13 leveraging Federal support for State commercializa-
14 tion efforts. The program shall provide matching
15 funds to a State, or consortium thereof, for the ac-
16 celeration of commercialization activities and the
17 promotion of small manufacturing enterprises in the
18 United States.

19 “(b) APPLICATION.—Applications for awards under
20 this section shall be submitted in such a manner, at such
21 a time, and containing such information as the Secretary
22 shall require, including—

23 “(1) a description of the current state of tech-
24 nology commercialization in the State or States, in-

1 including successes and barriers to commercialization;
2 and

3 “(2) a description of the State’s or consortium’s
4 plan for increasing commercialization of new tech-
5 nologies, products, processes, and services.

6 “(c) SELECTION CRITERIA.—The Secretary shall es-
7 tablish criteria for the selection of awardees, which shall
8 consider at a minimum a review of efforts during the fiscal
9 year prior to submitting an application to—

10 “(1) promote manufacturing; and

11 “(2) commercialize new technologies, products,
12 processes, and services, including activities to trans-
13 late federally funded research and technologies to
14 small manufacturing enterprises.

15 “(d) MATCHING REQUIREMENT.—A State or consor-
16 tium receiving a grant under this section shall provide
17 non-Federal cash contributions in an amount equal to 50
18 percent of the total cost of the project for which the grant
19 is provided.

20 “(e) COORDINATION AND NONDUPLICATION.—In
21 carrying out the program under this section, the Secretary
22 shall ensure that grants made under the program are co-
23 ordinated with, and do not duplicate, the efforts of other
24 commercialization programs within the Federal Govern-
25 ment.

1 “(f) EVALUATION.—

2 “(1) IN GENERAL.—Not later than 3 years
3 after the date of enactment of the America Com-
4 petes Reauthorization Act of 2015, the Secretary
5 shall enter into a contract with an independent enti-
6 ty, such as the National Academy of Sciences, to
7 conduct an evaluation of the program established
8 under subsection (a).

9 “(2) REQUIREMENTS.—The evaluation shall—

10 “(A) assess whether the program is achiev-
11 ing its goals;

12 “(B) include any recommendations for how
13 the program may be improved; and

14 “(C) include a recommendation as to
15 whether the program should be continued or
16 terminated.

17 “(g) DEFINITIONS.—In this section—

18 “(1) the term ‘State’ has the meaning given
19 that term in section 3 of the Public Works and Eco-
20 nomic Development Act of 1965 (42 U.S.C. 3122);
21 and

22 “(2) the term ‘commercialization’ has the
23 meaning given that term in section 9(e)(10) of the
24 Small Business Act (15 U.S.C. 638(e)(10)).

1 “(h) DURATION.—Each award shall be for a 5-year
2 period.

3 “(i) AUTHORIZATION OF APPROPRIATIONS.—There
4 are authorized to be appropriated to the Secretary
5 \$50,000,000 for each of fiscal years 2016 through 2018
6 to carry out this section.”.

7 **TITLE VI—DEPARTMENT OF**
8 **ENERGY**
9 **Subtitle A—Office of Science**

10 **SEC. 601. SHORT TITLE.**

11 This subtitle may be cited as the “Department of En-
12 ergy Office of Science Authorization Act of 2015”.

13 **SEC. 602. DEFINITIONS.**

14 Except as otherwise provided, in this subtitle:

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

17 (2) DIRECTOR.—The term “Director” means
18 the Director of the Office of Science.

19 (3) OFFICE OF SCIENCE.—The term “Office of
20 Science” means the Department of Energy Office of
21 Science.

22 (4) UNDER SECRETARY.—The term “Under
23 Secretary” means the Under Secretary for Science
24 and Energy.

1 (5) SECRETARY.—The term “Secretary” means
2 the Secretary of Energy.

3 **SEC. 603. MISSION OF THE OFFICE OF SCIENCE.**

4 Section 209 of the Department of Energy Organiza-
5 tion Act (42 U.S.C. 7139) is amended by adding at the
6 end the following:

7 “(c) MISSION.—The mission of the Office of Science
8 shall be the delivery of scientific discoveries, capabilities,
9 and major scientific tools to transform the understanding
10 of nature and to advance the energy, economic, and na-
11 tional security of the United States.

12 “(d) DUTIES.—In support of this mission, the Direc-
13 tor shall carry out programs, including those in basic en-
14 ergy sciences, biological and environmental research, ad-
15 vanced scientific computing research, fusion energy
16 sciences, high energy physics, and nuclear physics,
17 through activities focused on—

18 “(1) Science for Discovery to unravel nature’s
19 mysteries through activities which range from the
20 study of subatomic particles, atoms, and molecules
21 that make up the materials of our everyday world to
22 the study of DNA, proteins, cells, and entire biologi-
23 cal systems;

24 “(2) Science for National Need by—

1 “(A) advancing a clean energy agenda
2 through research on energy production, storage,
3 transmission, efficiency, and use; and

4 “(B) advancing our understanding of the
5 Earth and its climate through research in at-
6 mospheric and environmental sciences and cli-
7 mate change; and

8 “(3) National Scientific User Facilities to de-
9 liver the 21st century tools of science, engineering,
10 and technology and provide the Nation’s researchers
11 with the most advanced tools of modern science in-
12 cluding accelerators, colliders, supercomputers, light
13 sources and neutron sources, and facilities for study-
14 ing complex molecular systems and the nanoworld.

15 “(e) SUPPORTING ACTIVITIES.—The activities de-
16 scribed in subsection (d) shall include providing for rel-
17 evant facilities and infrastructure, programmatic analysis,
18 interagency coordination, and workforce development and
19 outreach activities.

20 “(f) USER FACILITIES.—

21 “(1) IN GENERAL.—The Director shall carry
22 out the construction, operation, and maintenance of
23 user facilities, including underground research facili-
24 ties, to support the activities described in subsection
25 (d). As practicable, these facilities shall serve the

1 needs of the Department, industry, the academic
2 community, and other relevant entities for the pur-
3 poses of advancing the missions of the Department.

4 “(2) COORDINATION WITH OTHER FEDERAL
5 AGENCIES.—The Director may form partnerships to
6 enhance the utilization of and ensure access to user
7 facilities, including underground research facilities,
8 by other Federal agencies.

9 “(g) OTHER AUTHORIZED ACTIVITIES.—In addition
10 to the activities authorized under the Department of En-
11 ergy Office of Science Authorization Act of 2015, the Of-
12 fice of Science shall carry out other such activities as it
13 is authorized or required to carry out by law.

14 “(h) COORDINATION AND JOINT ACTIVITIES WITH
15 OTHER DEPARTMENT OF ENERGY PROGRAMS.—The
16 Under Secretary shall ensure the coordination of activities
17 under the Department of Energy Office of Science Author-
18 ization Act of 2015 with the other activities of the Depart-
19 ment, and shall support joint activities among the pro-
20 grams of the Department.

21 “(i) DOMESTIC MANUFACTURING CAPABILITY FOR
22 OFFICE OF SCIENCE FACILITIES REPORT.—Not later
23 than one year after the date of enactment of the Depart-
24 ment of Energy Office of Science Authorization Act of
25 2015, the Secretary shall transmit a report to the Com-

1 mittee on Science, Space, and Technology of the House
2 of Representatives and the Committee on Energy and
3 Natural Resources of the Senate. The report shall—

4 “(1) assess the current ability of domestic man-
5 ufacturers to meet the procurement requirements for
6 major ongoing projects funded by the Office of
7 Science, including a calculation of the percentage of
8 equipment acquired from domestic manufacturers
9 for this purpose; and

10 “(2) identify steps that can be taken by the
11 Federal Government and by private industry to in-
12 crease the capability of domestic manufacturers to
13 meet procurement requirements of the Office of
14 Science for major projects.”.

15 **SEC. 604. BASIC ENERGY SCIENCES PROGRAM.**

16 (a) PROGRAM.—As part of the activities authorized
17 under the amendment made by section 603, the Director
18 shall carry out a program in basic energy sciences, includ-
19 ing materials sciences and engineering, chemical sciences,
20 physical biosciences, and geosciences, for the purpose of
21 providing the scientific foundations for new energy tech-
22 nologies and addressing scientific grand challenges.

23 (b) BASIC ENERGY SCIENCES USER FACILITIES.—

24 (1) IN GENERAL.—The Director shall carry out
25 a subprogram to support and oversee the construc-

1 tion, operation, and maintenance of national user fa-
2 cilities that support the program under this section.
3 As practicable, these facilities shall serve the needs
4 of the Department, industry, the academic commu-
5 nity, and other relevant entities to create and exam-
6 ine new materials and chemical processes for the
7 purposes of advancing new energy technologies and
8 improving the competitiveness of the United States.
9 These facilities shall include—

- 10 (A) x-ray light sources;
11 (B) neutron sources;
12 (C) nanoscale science research centers; and
13 (D) other facilities the Director considers
14 appropriate, consistent with section 209(f) of
15 the Department of Energy Organization Act
16 (42 U.S.C. 7139(f)).

17 (2) FACILITY RESEARCH AND DEVELOPMENT.—
18 The Director shall carry out research and develop-
19 ment on advanced accelerator and storage ring tech-
20 nologies relevant to the Basic Energy Sciences user
21 facilities, in consultation with the Office of Science’s
22 High Energy Physics and Nuclear Physics pro-
23 grams.

24 (3) FACILITY CONSTRUCTION AND UP-
25 GRADES.—Consistent with the Office of Science’s

1 project management practices, the Director shall
2 support construction of—

3 (A) an upgrade of the Advanced Photon
4 Source to optimize and enhance beam bright-
5 ness;

6 (B) a Second Target Station at the Spall-
7 ation Neutron Source to double user capacity
8 and expand the suite of instruments to meet
9 new scientific challenges;

10 (C) the Linac Coherent Light Source II to
11 expand the x-ray wavelength range, incorporate
12 high repetition rate operation for soft and me-
13 dium energy x-rays, and increase user capacity
14 of the Linac Coherent Light Source; and

15 (D) an upgrade to the Advanced Light
16 Source to improve brightness and performance.

17 (c) ENERGY FRONTIER RESEARCH CENTERS.—

18 (1) IN GENERAL.—The Director shall carry out
19 a program to provide awards, on a competitive,
20 merit-reviewed basis, to multi-institutional collabora-
21 tions or other appropriate entities to conduct funda-
22 mental and use-inspired energy research to accel-
23 erate scientific breakthroughs related to needs iden-
24 tified in—

1 (A) the Grand Challenges report of the De-
2 partment's Basic Energy Sciences Advisory
3 Committee;

4 (B) the report of the Department's Basic
5 Energy Sciences Advisory Committee entitled
6 "From Quanta to the Continuum: Opportuni-
7 ties for Mesoscale Science";

8 (C) the Basic Energy Sciences Basic Re-
9 search Needs workshop report; or

10 (D) other relevant reports identified by the
11 Director.

12 (2) COLLABORATIONS.—A collaboration receiv-
13 ing an award under this subsection may include mul-
14 tiple types of institutions and private sector entities.

15 (3) SELECTION AND DURATION.—

16 (A) IN GENERAL.—A collaboration under
17 this subsection shall be selected for a period of
18 5 years. An Energy Frontier Research Center
19 already in existence and supported by the Di-
20 rector on the date of enactment of this Act may
21 continue to receive support for a period of 5
22 years beginning on the date of establishment of
23 that center.

24 (B) REAPPLICATION.—After the end of the
25 period described in subparagraph (A), an

1 awardee may reapply for selection for a second
2 period of 5 years on a competitive, merit-re-
3 viewed basis.

4 (C) **TERMINATION.**—Consistent with the
5 existing authorities of the Department, the Di-
6 rector may terminate an underperforming cen-
7 ter for cause during the performance period.

8 (4) **NO FUNDING FOR CONSTRUCTION.**—No
9 funding provided pursuant to this subsection may be
10 used for the construction of new buildings or facili-
11 ties.

12 **SEC. 605. BIOLOGICAL AND ENVIRONMENTAL RESEARCH.**

13 (a) **IN GENERAL.**—As part of the activities author-
14 ized under section 209 of the Department of Energy Orga-
15 nization Act (42 U.S.C. 7139), and coordinated with the
16 activities authorized under section 604 and section 606,
17 the Director shall carry out a program of research and
18 development in the areas of biological systems science and
19 climate and environmental science, including subsurface
20 science, to support the energy and environmental missions
21 of the Department.

22 (b) **BIOLOGICAL SYSTEMS SCIENCE ACTIVITIES.**—

23 (1) **ACTIVITIES.**—As part of the activities au-
24 thorized under subsection (a), the Director shall
25 carry out research and development activities in fun-

1 damental, structural, computational, and systems bi-
2 ology to increase systems-level understanding of the
3 complex biological systems, which shall include ac-
4 tivities to—

5 (A) accelerate breakthroughs and new
6 knowledge that will enable cost-effective sus-
7 tainable production of—

8 (i) biomass-based liquid transpor-
9 tation fuels;

10 (ii) bioenergy; and

11 (iii) biobased materials;

12 (B) improve understanding of the global
13 carbon cycle, including processes for removing
14 carbon dioxide from the atmosphere, through
15 photosynthesis and other biological processes,
16 for sequestration and storage; and

17 (C) understand the biological mechanisms
18 used to transform, immobilize, or remove con-
19 taminants from subsurface environments.

20 (2) BIOENERGY RESEARCH CENTERS.—

21 (A) IN GENERAL.—In carrying out activi-
22 ties under paragraph (1), the Director shall
23 support at least 3 bioenergy research centers to
24 accelerate advanced research and development
25 of biomass-based liquid transportation fuels,

1 bioenergy, or biobased materials that are pro-
2 duced from a variety of regionally diverse feed-
3 stocks.

4 (B) SELECTION AND DURATION.—A center
5 established under subparagraph (A) shall be se-
6 lected on a competitive, merit-reviewed basis for
7 a period of 5 years beginning on the date of es-
8 tablishment of that center. A center already in
9 existence on the date of enactment of this Act
10 may continue to receive support for a period of
11 5 years beginning on the date of establishment
12 of that center.

13 (C) RENEWAL.—After the end of the pe-
14 riod described in subparagraph (B), an awardee
15 may apply for a second period of 5 years on a
16 merit-reviewed basis.

17 (D) TERMINATION.—Consistent with the
18 existing authorities of the Department, the Di-
19 rector may terminate an underperforming cen-
20 ter for cause during the performance period.

21 (3) LOW DOSE RADIATION RESEARCH PRO-
22 GRAM.—

23 (A) IN GENERAL.—The Director shall
24 carry out a research program on low dose radi-
25 ation. The purpose of the program is to en-

1 hance the scientific understanding of and re-
2 duce uncertainties associated with the effects of
3 exposure to low dose radiation in order to in-
4 form improved risk management methods.

5 (B) DEFINITION.—In this paragraph, the
6 term “low dose radiation” means a radiation
7 dose of less than 100 millisieverts.

8 (C) STUDY.—Not later than 60 days after
9 the date of enactment of this Act, the Director
10 shall enter into an agreement with the National
11 Academies to conduct a study assessing the
12 current status and development of a long-term
13 strategy for low dose radiation research. The
14 study shall be conducted in coordination with
15 Federal agencies that perform ionizing radi-
16 ation effects research.

17 (D) CONTENTS.—The study performed
18 under subparagraph (C) shall—

19 (i) identify current scientific chal-
20 lenges for understanding the long-term ef-
21 fects of ionizing radiation;

22 (ii) assess the status of current low
23 dose radiation research in the United
24 States and internationally;

1 (iii) formulate overall scientific goals
2 for the future of low-dose radiation re-
3 search in the United States;

4 (iv) recommend a long-term strategic
5 and prioritized research agenda to address
6 scientific research goals for overcoming the
7 identified scientific challenges in coordina-
8 tion with other research efforts;

9 (v) define the essential components of
10 a research program that would address
11 this research agenda within the universities
12 and the National Laboratories; and

13 (vi) assess the cost-benefit effective-
14 ness of such a program.

15 (E) 5-YEAR RESEARCH PLAN.—Not later
16 than 90 days after the completion of the assess-
17 ment performed under subparagraph (C), the
18 Secretary shall deliver to the Committee on
19 Science, Space, and Technology of the House of
20 Representatives and the Committee on Energy
21 and Natural Resources of the Senate a five-year
22 research plan that responds to the assessment's
23 findings and recommendations and identifies
24 and prioritizes research needs.

1 (4) REPEAL.—Section 977 of the Energy Policy
2 Act of 2005 (42 U.S.C. 16317) is repealed.

3 (c) CLIMATE AND ENVIRONMENTAL SCIENCE ACTIVI-
4 TIES.—

5 (1) IN GENERAL.—As part of the activities au-
6 thorized under subsection (a), and in coordination
7 with activities carried out under subsection (b), the
8 Director shall carry out climate and environmental
9 science research, which shall include activities to—

10 (A) understand, observe, and model the re-
11 sponse of Earth’s atmosphere and biosphere to
12 increased concentrations of greenhouse gas
13 emissions and any associated changes in cli-
14 mate;

15 (B) understand the processes for immo-
16 bilization, or removal of, and understand the
17 movement of, energy production-derived con-
18 taminants such as radionuclides and heavy met-
19 als, and understand the process of sequestration
20 and transformation of carbon dioxide in sub-
21 surface environments; and

22 (C) inform potential mitigation and adap-
23 tation options for increased concentrations of
24 greenhouse gas emissions and any associated
25 changes in climate.

1 (2) SUBSURFACE BIOGEOCHEMICAL RE-
2 SEARCH.—

3 (A) IN GENERAL.—As part of the activities
4 described in paragraph (1), the Director shall
5 carry out research to advance a fundamental
6 understanding of coupled physical, chemical,
7 and biological processes for controlling the
8 movement of sequestered carbon and subsurface
9 environmental contaminants.

10 (B) COORDINATION.—

11 (i) DIRECTOR.—The Director shall
12 carry out activities under this paragraph in
13 accordance with priorities established by
14 the Under Secretary to support and accel-
15 erate the decontamination of relevant fa-
16 cilities managed by the Department.

17 (ii) UNDER SECRETARY.—The Under
18 Secretary shall ensure the coordination of
19 activities of the Department, including ac-
20 tivities under this paragraph, to support
21 and accelerate the decontamination of rel-
22 evant facilities managed by the Depart-
23 ment.

24 (3) CLIMATE AND EARTH MODELING.—As part
25 of the activities described in paragraph (1), the Di-

1 rector, in collaboration with the Advanced Scientific
2 Computing Research program described in section
3 606, shall carry out research to develop, evaluate,
4 and use high-resolution regional climate, global cli-
5 mate, and Earth models to inform decisions on re-
6 ducing the impacts of a changing climate. Such
7 modeling shall include, among other critical ele-
8 ments, greenhouse gas emissions, land use, and
9 interaction among human and Earth systems.

10 **SEC. 606. ADVANCED SCIENTIFIC COMPUTING RESEARCH**
11 **PROGRAM.**

12 (a) IN GENERAL.—As part of the activities author-
13 ized under section 209 of the Department of Energy Orga-
14 nization Act (42 U.S.C. 7139), the Director shall carry
15 out a research, development, demonstration, and commer-
16 cial application program to advance computational and
17 networking capabilities for data-driven discovery and to
18 analyze, model, simulate, and predict complex phenomena
19 relevant to the development of new energy technologies
20 and the competitiveness of the United States.

21 (b) COORDINATION.—The Under Secretary shall en-
22 sure the coordination of the activities of the Department,
23 including activities under this section, to determine and
24 meet the computational and networking research and fa-
25 cility needs of the Office of Science and all other relevant

1 energy technology and energy efficiency programs within
2 the Department.

3 (c) RESEARCH TO SUPPORT ENERGY APPLICA-
4 TIONS.—

5 (1) IN GENERAL.—As part of the activities au-
6 thorized under subsection (a), the program shall
7 support research in high-performance computing and
8 networking relevant to energy applications including
9 modeling, simulation, and advanced data analytics
10 for basic and applied energy research programs car-
11 ried out by the Secretary.

12 (2) REPORT.—Not later than 1 year after the
13 date of enactment of this Act, the Secretary shall
14 transmit to the Congress a plan to integrate and le-
15 verage the expertise and capabilities of the program
16 described in subsection (a), as well as other relevant
17 computational and networking research programs
18 and resources supported by the Federal Government,
19 to advance the missions of the Department's applied
20 energy and energy efficiency programs.

21 (d) APPLIED MATHEMATICS AND SOFTWARE DEVEL-
22 OPMENT FOR HIGH-END COMPUTING SYSTEMS.—The Di-
23 rector shall carry out activities to develop, test, and sup-
24 port mathematics, models, and algorithms for complex
25 systems, as well as programming environments, tools, lan-

1 guages, and operating systems for high-end computing
2 systems (as defined in section 2 of the Department of En-
3 ergy High-End Computing Revitalization Act of 2004 (15
4 U.S.C. 5541)).

5 (e) EXASCALE COMPUTING PROGRAM.—Section 3 of
6 the Department of Energy High-End Computing Revital-
7 ization Act of 2004 (15 U.S.C. 5542) is amended—

8 (1) in subsection (a)—

9 (A) in paragraph (1), by striking “pro-
10 gram” and inserting “coordinated program
11 across the Department”;

12 (B) by striking “and” at the end of para-
13 graph (1);

14 (C) by striking the period at the end of
15 paragraph (2) and inserting “; and”; and

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

18 “(3) partner with universities, National Labora-
19 tories, and industry to ensure the broadest possible
20 application of the technology developed in this pro-
21 gram to other challenges in science, engineering,
22 medicine, and industry.”;

23 (2) in subsection (b)(2), by striking “vector”
24 and all that follows through “architectures” and in-
25 serting “computer technologies that show promise of

1 substantial reductions in power requirements and
2 substantial gains in parallelism of multicore pro-
3 cessors, concurrency, memory and storage, band-
4 width, and reliability”; and

5 (3) by striking subsection (d) and inserting the
6 following:

7 “(d) EXASCALE COMPUTING PROGRAM.—

8 “(1) IN GENERAL.—The Secretary shall con-
9 duct a coordinated research program to develop
10 exascale computing systems to advance the missions
11 of the Department.

12 “(2) EXECUTION.—The Secretary shall,
13 through competitive merit review, establish two or
14 more National Laboratory-industry-university part-
15 nerships to conduct integrated research, develop-
16 ment, and engineering of multiple exascale architec-
17 tures, and—

18 “(A) conduct mission-related co-design ac-
19 tivities in developing such exascale platforms;

20 “(B) develop those advancements in hard-
21 ware and software technology required to fully
22 realize the potential of an exascale production
23 system in addressing Department target appli-
24 cations and solving scientific problems involving

1 predictive modeling and simulation and large-
2 scale data analytics and management; and

3 “(C) explore the use of exascale computing
4 technologies to advance a broad range of
5 science and engineering.

6 “(3) ADMINISTRATION.—In carrying out this
7 program, the Secretary shall—

8 “(A) provide, on a competitive, merit-re-
9 viewed basis, access for researchers in United
10 States industry, institutions of higher edu-
11 cation, National Laboratories, and other Fed-
12 eral agencies to these exascale systems, as ap-
13 propriate; and

14 “(B) conduct outreach programs to in-
15 crease the readiness for the use of such plat-
16 forms by domestic industries, including manu-
17 facturers.

18 “(4) REPORTS.—

19 “(A) INTEGRATED STRATEGY AND PRO-
20 GRAM MANAGEMENT PLAN.—The Secretary
21 shall submit to Congress, not later than 90
22 days after the date of enactment of the Depart-
23 ment of Energy Office of Science Authorization
24 Act of 2015, a report outlining an integrated
25 strategy and program management plan, in-

1 including target dates for prototypical and pro-
2 duction exascale platforms, interim milestones
3 to reaching these targets, functional require-
4 ments, roles and responsibilities of National
5 Laboratories and industry, acquisition strategy,
6 and estimated resources required, to achieve
7 this exascale system capability. The report shall
8 include the Secretary's plan for Departmental
9 organization to manage and execute the
10 Exascale Computing Program, including defini-
11 tion of the roles and responsibilities within the
12 Department to ensure an integrated program
13 across the Department. The report shall also
14 include a plan for ensuring balance and
15 prioritizing across ASCR subprograms in a flat
16 or slow-growth budget environment.

17 “(B) STATUS REPORTS.—At the time of
18 the budget submission of the Department for
19 each fiscal year, the Secretary shall submit a
20 report to Congress that describes the status of
21 milestones and costs in achieving the objectives
22 of the exascale computing program.

23 “(C) EXASCALE MERIT REPORT.—At least
24 18 months prior to the initiation of construction
25 or installation of any exascale-class computing

1 facility, the Secretary shall transmit a plan to
2 the Congress detailing—

3 “(i) the proposed facility’s cost projec-
4 tions and capabilities to significantly accel-
5 erate the development of new energy tech-
6 nologies;

7 “(ii) technical risks and challenges
8 that must be overcome to achieve success-
9 ful completion and operation of the facility;
10 and

11 “(iii) an independent assessment of
12 the scientific and technological advances
13 expected from such a facility relative to
14 those expected from a comparable invest-
15 ment in expanded research and applica-
16 tions at terascale-class and petascale-class
17 computing facilities, including an evalua-
18 tion of where investments should be made
19 in the system software and algorithms to
20 enable these advances.”.

21 (f) DEFINITIONS.—Section 2 of the Department of
22 Energy High-End Computing Revitalization Act of 2004
23 (15 U.S.C. 5541) is amended by striking paragraphs (1)
24 through (5) and inserting the following:

1 “(1) CO-DESIGN.—The term ‘co-design’ means
2 the joint development of application algorithms,
3 models, and codes with computer technology archi-
4 tectures and operating systems to maximize effective
5 use of high-end computing systems.

6 “(2) DEPARTMENT.—The term ‘Department’
7 means the Department of Energy.

8 “(3) EXASCALE.—The term ‘exascale’ means
9 computing system performance at or near 10 to the
10 18th power floating point operations per second.

11 “(4) HIGH-END COMPUTING SYSTEM.—The
12 term ‘high-end computing system’ means a com-
13 puting system with performance that substantially
14 exceeds that of systems that are commonly available
15 for advanced scientific and engineering applications.

16 “(5) LEADERSHIP SYSTEM.—The term ‘Leader-
17 ship System’ means a high-end computing system
18 that is among the most advanced in the world in
19 terms of performance in solving scientific and engi-
20 neering problems.

21 “(6) INSTITUTION OF HIGHER EDUCATION.—
22 The term ‘institution of higher education’ has the
23 meaning given the term in section 2 of the Energy
24 Policy Act of 2005 (42 U.S.C. 15801).

1 “(7) NATIONAL LABORATORY.—The term ‘Na-
2 tional Laboratory’ has the meaning given the term
3 in section 2 of the Energy Policy Act of 2005 (42
4 U.S.C. 15801).

5 “(8) SECRETARY.—The term ‘Secretary’ means
6 the Secretary of Energy.

7 “(9) SOFTWARE TECHNOLOGY.—The term
8 ‘software technology’ includes optimal algorithms,
9 programming environments, tools, languages, and
10 operating systems for high-end computing systems.”.

11 **SEC. 607. FUSION ENERGY RESEARCH.**

12 (a) PROGRAM.—As part of the activities authorized
13 under section 209 of the Department of Energy Organiza-
14 tion Act (42 U.S.C. 7139) and section 972 of the Energy
15 Policy Act of 2005 (42 U.S.C. 16312), the Director shall
16 carry out a fusion energy sciences research and enabling
17 technology development program to effectively address the
18 scientific and engineering challenges to building a cost-
19 competitive fusion power plant and to establish a competi-
20 tive fusion power industry in the United States. As part
21 of this program, the Director shall carry out research ac-
22 tivities to expand the fundamental understandings of plas-
23 mas and matter at very high temperatures and densities
24 for fusion applications and for other plasma science appli-
25 cations.

1 (b) TOKAMAK RESEARCH AND DEVELOPMENT.—

2 (1) IN GENERAL.—As part of the program de-
3 scribed in subsection (a), the Director shall support
4 research and development activities and facility oper-
5 ations to—

6 (A) optimize the tokamak approach to fu-
7 sion energy; and

8 (B) determine the viability of the tokamak
9 approach to fusion energy to lead to a commer-
10 cial fusion power plant.

11 (2) ITER.—

12 (A) RESPONSIBILITIES.—The Director
13 shall coordinate and carry out the responsibil-
14 ities of the United States with respect to the
15 ITER international fusion project pursuant to
16 the Agreement on the Establishment of the
17 International Fusion Energy Organization for
18 the Joint Implementation of the ITER Project.

19 (B) REPORT.—Not later than 1 year after
20 the date of enactment of this Act, the Secretary
21 shall submit to Congress a report providing an
22 assessment of—

23 (i) the most recent schedule for ITER
24 that has been approved by the ITER
25 Council; and

1 (ii) progress of the ITER Council and
2 the ITER Director-General toward imple-
3 mentation of the recommendations of the
4 Third Biennial International Organization
5 Management Assessment Report.

6 (C) FAIRNESS IN COMPETITION FOR SO-
7 LICITATIONS FOR INTERNATIONAL PROJECT AC-
8 TIVITIES.—Section 33 of the Atomic Energy
9 Act of 1954 (42 U.S.C. 2053) is amended by
10 adding at the end the following: “For purposes
11 of this section, with respect to international re-
12 search projects, the term ‘private facilities or
13 laboratories’ shall refer to facilities or labora-
14 tories located in the United States.”.

15 (D) SENSE OF CONGRESS.—It is the sense
16 of Congress that the United States should sup-
17 port a robust, diverse program in addition to
18 meeting its commitments to ITER. It is further
19 the sense of Congress that developing the sci-
20 entific basis for fusion, providing research re-
21 sults key to the success of ITER, and training
22 the next generation of fusion scientists are of
23 critical importance to the United States and
24 should in no way be diminished by participation
25 of the United States in the ITER project.

1 (c) INERTIAL FUSION ENERGY RESEARCH AND DE-
2 VELOPMENT PROGRAM.—The Secretary shall carry out a
3 program of research and technology development in iner-
4 tial fusion for energy applications, including ion beam,
5 laser, and pulsed power fusion systems.

6 (d) ALTERNATIVE AND ENABLING CONCEPTS.—

7 (1) IN GENERAL.—As part of the program de-
8 scribed in subsection (a), the Director shall support
9 research and development activities and facility oper-
10 ations at United States universities, national labora-
11 tories, and private facilities for a portfolio of alter-
12 native and enabling fusion energy concepts that may
13 provide solutions to significant challenges to the es-
14 tablishment of a commercial magnetic fusion power
15 plant, prioritized based on the ability of the United
16 States to play a leadership role in the international
17 fusion research community. Fusion energy concepts
18 and activities explored under this paragraph may in-
19 clude—

20 (A) high magnetic field approaches facili-
21 tated by high temperature superconductors;

22 (B) advanced stellarator concepts;

23 (C) non-tokamak confinement configura-
24 tions operating at low magnetic fields;

1 (D) magnetized target fusion energy con-
2 cepts;

3 (E) liquid metals to address issues associ-
4 ated with fusion plasma interactions with the
5 inner wall of the encasing device;

6 (F) immersion blankets for heat manage-
7 ment and fuel breeding;

8 (G) advanced scientific computing activi-
9 ties: and

10 (H) other promising fusion energy con-
11 cepts identified by the Director.

12 (2) COORDINATION WITH ARPA-E.—The Under
13 Secretary and the Director shall coordinate with the
14 Director of the Advanced Research Projects Agency–
15 Energy (in this paragraph referred to as “ARPA–
16 E”) to—

17 (A) assess the potential for any fusion en-
18 ergy project supported by ARPA-E to rep-
19 resent a promising approach to a commercially
20 viable fusion power plant;

21 (B) determine whether the results of any
22 fusion energy project supported by ARPA-E
23 merit the support of follow-on research activi-
24 ties carried out by the Office of Science; and

1 (C) avoid unintentional duplication of ac-
2 tivities.

3 (e) FUSION MATERIALS RESEARCH AND DEVELOP-
4 MENT.—As part of the activities authorized in section 978
5 of the Energy Policy Act of 2005 (42 U.S.C. 16318), the
6 Director, in coordination with the Assistant Secretary for
7 Nuclear Energy of the Department, shall carry out re-
8 search and development activities to identify, characterize,
9 and create materials that can endure the neutron, plasma,
10 and heat fluxes expected in a commercial fusion power
11 plant. As part of the activities authorized under subsection
12 (g), the Secretary shall—

13 (1) provide an assessment of the need for a fa-
14 cility or facilities that can examine and test potential
15 fusion and next generation fission reactor materials
16 and other enabling technologies relevant to the de-
17 velopment of commercial fusion power plants; and

18 (2) provide an assessment of whether a single
19 new facility that substantially addresses magnetic
20 fusion, inertial fusion, and next generation fission
21 materials research needs is feasible, in conjunction
22 with the expected capabilities of facilities operational
23 at the time of this assessment.

24 (f) GENERAL PLASMA SCIENCE AND APPLICA-
25 TIONS.—Not later than 2 years after the date of enact-

1 ment of this Act, the Secretary shall provide to Congress
2 an assessment of opportunities in which the United States
3 can provide world-leading contributions to advancing plas-
4 ma science and non-fusion energy applications, and iden-
5 tify opportunities for partnering with other Federal agen-
6 cies both within and outside of the Department of Energy.

7 (g) IDENTIFICATION OF PRIORITIES.—

8 (1) REPORT.—Not later than 2 years after the
9 date of enactment of this Act, the Secretary shall
10 transmit to Congress a report on the Department’s
11 proposed fusion energy research and development
12 activities over the following 10 years under at least
13 3 realistic budget scenarios, including a scenario
14 based on 3 percent annual growth in the non-ITER
15 portion of the budget for fusion energy research and
16 development activities. The report shall—

17 (A) identify specific areas of fusion energy
18 research and enabling technology development
19 in which the United States can and should es-
20 tablish or solidify a lead in the global fusion en-
21 ergy development effort;

22 (B) identify priorities for initiation of facil-
23 ity construction and facility decommissioning
24 under each of those scenarios;

1 (C) provide a roadmap addressing critical
2 scientific challenges to ensure that within 10
3 years after the date of enactment of this Act
4 there is sufficient basis to justify and motivate
5 the initiation of an applied fusion energy devel-
6 opment program; and

7 (D) assess the ability of the United States
8 fusion workforce to carry out the activities iden-
9 tified in subparagraphs (A) through (C), includ-
10 ing the adequacy of college and university pro-
11 grams to train the leaders and workers of the
12 next generation of fusion energy researchers.

13 (2) PROCESS.—In order to develop the report
14 required under paragraph (1), the Secretary shall le-
15 verage best practices and lessons learned from the
16 process used to develop the most recent report of the
17 Particle Physics Project Prioritization Panel of the
18 High Energy Physics Advisory Panel. No member of
19 the Fusion Energy Sciences Advisory Committee
20 shall be excluded from participating in developing or
21 voting on final approval of the report required under
22 paragraph (1).

23 **SEC. 608. HIGH ENERGY PHYSICS PROGRAM.**

24 (a) IN GENERAL.—As part of the activities author-
25 ized under section 209 of the Department of Energy Orga-

1 nization Act (42 U.S.C. 7139), the Director shall carry
2 out a research program on the elementary constituents of
3 matter and energy and the nature of space and time.

4 (b) ENERGY FRONTIER RESEARCH.—As part of the
5 program described in subsection (a), the Director shall
6 carry out research using high energy accelerators and ad-
7 vanced detectors to create and study interactions of novel
8 particles and investigate fundamental forces.

9 (c) NEUTRINO RESEARCH.—As part of the program
10 described in subsection (a), the Director shall carry out
11 research activities on rare decay processes and the nature
12 of the neutrino, which may include collaborations with the
13 National Science Foundation or international collabora-
14 tions on relevant research projects.

15 (d) DARK ENERGY AND DARK MATTER RE-
16 SEARCH.—As part of the program described in subsection
17 (a), the Director shall carry out research activities on the
18 nature of dark energy and dark matter. These activities
19 shall be consistent with the research priorities identified
20 by the High Energy Physics Advisory Panel or the Na-
21 tional Academy of Sciences, and may include—

22 (1) collaborations with the National Aeronautics
23 and Space Administration, the National Science
24 Foundation, or international collaborations on rel-
25 evant research projects; and

1 (2) the development of space-based, land-based,
2 and underground facilities and experiments.

3 (e) FACILITY CONSTRUCTION AND MAJOR ITEMS OF
4 EQUIPMENT.—Consistent with the Office of Science’s
5 project management practices, the Director shall support
6 construction or fabrication of—

7 (1) an international Long-Baseline Neutrino
8 Facility based in the United States;

9 (2) the Muon to Electron Conversion Experi-
10 ment;

11 (3) Second Generation Dark Matter experi-
12 ments;

13 (4) the Dark Energy Spectroscopic Instrument;

14 (5) the Large Synoptic Survey Telescope cam-
15 era;

16 (6) upgrades to components of the Large
17 Hadron Collider; and

18 (7) other high priority projects recommended in
19 the most recent report of the Particle Physics
20 Project Prioritization Panel of the High Energy
21 Physics Advisory Panel.

22 (f) ACCELERATOR RESEARCH AND DEVELOPMENT.—
23 As part of the program described in subsection (a), the
24 Director shall carry out research and development in ad-
25 vanced accelerator concepts and technologies, including

1 laser technologies, to reduce the necessary scope and cost
2 for the next generation of particle accelerators, in coordi-
3 nation with the Office of Science's Basic Energy Sciences
4 and Nuclear Physics programs.

5 (g) INTERNATIONAL COLLABORATION.—The Direc-
6 tor, as practicable and in coordination with other appro-
7 priate Federal agencies as necessary, shall ensure the ac-
8 cess of United States researchers to the most advanced
9 accelerator facilities and research capabilities in the world,
10 including the Large Hadron Collider.

11 **SEC. 609. NUCLEAR PHYSICS PROGRAM.**

12 (a) PROGRAM.—As part of the activities authorized
13 under section 209 of the Department of Energy Organiza-
14 tion Act (42 U.S.C. 7139), the Director shall carry out
15 a research program, and support relevant facilities, to dis-
16 cover and understand various forms of nuclear matter.

17 (b) FACILITY CONSTRUCTION.—

18 (1) IN GENERAL.—Consistent with the Office of
19 Science's project management practices, the Director
20 shall continue to support the construction of the Fa-
21 cility for Rare Isotope Beams.

22 (2) REPEAL.—Section 981 of the Energy Policy
23 Act of 2005 (42 U.S.C. 16321) is repealed.

24 (c) ISOTOPE DEVELOPMENT AND PRODUCTION FOR
25 RESEARCH APPLICATIONS.—

1 (1) IN GENERAL.—The Director shall carry out
2 a program for the production of isotopes that the
3 Director determines are needed for research and ap-
4 plications, including—

5 (A) the development of techniques to
6 produce isotopes; and

7 (B) support for infrastructure required for
8 isotope research and production.

9 (2) COORDINATION.—In making the determina-
10 tion described in paragraph (1), the Secretary
11 shall—

12 (A) ensure that isotope production activi-
13 ties do not compete with private industry unless
14 critical national interests necessitate the Fed-
15 eral Government’s involvement; and

16 (B) consider any relevant recommendations
17 made by Federal advisory committees, the Na-
18 tional Academies, and interagency working
19 groups in which the Department participates.

20 **SEC. 610. SCIENCE LABORATORIES INFRASTRUCTURE PRO-**
21 **GRAM.**

22 (a) PROGRAM.—The Director shall carry out a pro-
23 gram to improve the safety, efficiency, and mission readi-
24 ness of infrastructure at Office of Science laboratories.
25 The program shall include projects to—

1 (1) renovate or replace space that does not
2 meet research needs;

3 (2) replace facilities that are no longer cost ef-
4 fective to renovate or operate;

5 (3) modernize utility systems to prevent failures
6 and ensure efficiency;

7 (4) remove excess facilities to allow safe and ef-
8 ficient operations; and

9 (5) construct modern facilities to conduct ad-
10 vanced research in controlled environmental condi-
11 tions.

12 (b) APPROACH.—In carrying out this section, the Di-
13 rector shall utilize all available approaches and mecha-
14 nisms, including capital line items, minor construction
15 projects, energy savings performance contracts, utility en-
16 ergy service contracts, alternative financing, and expense
17 funding, as appropriate.

18 (c) DEFINITION.—The term “Office of Science lab-
19 oratory” means a subset of National Laboratories as de-
20 fined in section 2(3) of the Energy Policy Act of 2005
21 (42 U.S.C. 15801) consisting of subparagraphs (A), (B),
22 (C), (D), (F), (K), (L), (M), (P), and (Q).

23 **SEC. 611. AUTHORIZATION OF APPROPRIATIONS.**

24 There are authorized to be appropriated to the Sec-
25 retary for the activities of the Office of Science—

- 1 (1) \$5,339,794,000 for fiscal year 2016;
- 2 (2) \$5,606,783,700 for fiscal year 2017;
- 3 (3) \$5,887,122,885 for fiscal year 2018;
- 4 (4) \$6,181,479,029 for fiscal year 2019; and
- 5 (5) \$6,490,552,981 for fiscal year 2020.

6 **Subtitle B—ARPA-E**

7 **SEC. 621. SHORT TITLE.**

8 This subtitle may be cited as the “ARPA-E Reau-
9 thorization Act of 2015”.

10 **SEC. 622. ARPA-E AMENDMENTS.**

11 Section 5012 of the America COMPETES Act (42
12 U.S.C. 16538) is amended—

13 (1) by redesignating subsection (n) as sub-
14 section (o) and inserting after subsection (m) the
15 following new subsection:

16 “(n) PROTECTION OF PROPRIETARY INFORMA-
17 TION.—The following categories of information collected
18 by the Advanced Research Projects Agency-Energy from
19 recipients of financial assistance awards shall be consid-
20 ered privileged and confidential and not subject to disclo-
21 sure pursuant to section 552 of title 5, United States
22 Code:

23 “(1) Plans for commercialization of technologies
24 developed under the award, including business plans,

1 technology to market plans, market studies, and cost
2 and performance models.

3 “(2) Investments provided to an awardee from
4 third parties, such as venture capital, hedge fund, or
5 private equity firms, including amounts and percent-
6 age of ownership of the awardee provided in return
7 for such investments.

8 “(3) Additional financial support that the
9 awardee plans to invest or has invested into the
10 technology developed under the award, or that the
11 awardee is seeking from third parties.

12 “(4) Revenue from the licensing or sale of new
13 products or services resulting from the research con-
14 ducted under the award.”; and

15 (2) in paragraph (2) of subsection (o), as so re-
16 designated by paragraph (1) of this section, by—

17 (A) striking “and” at the end of subpara-
18 graph (D);

19 (B) striking the period at the end of sub-
20 paragraph (E) and inserting a semicolon; and

21 (C) adding at the end the following:

22 “(F) \$325,000,000 for fiscal year 2016;

23 “(G) \$341,250,000 for fiscal year 2017;

24 “(H) \$358,312,500 for fiscal year 2018;

1 “(I) \$376,228,125 for fiscal year 2019;

2 and

3 “(J) \$395,039,531 for fiscal year 2020.”.

4 **Subtitle C—Energy Innovation**

5 **SEC. 641. ENERGY INNOVATION HUBS.**

6 (a) AUTHORIZATION OF PROGRAM.—

7 (1) IN GENERAL.—The Secretary of Energy
8 shall carry out a program to enhance the Nation’s
9 economic, environmental, and energy security by
10 making awards to consortia for establishing and op-
11 erating Energy Innovation Hubs to conduct and
12 support, whenever practicable at one centralized lo-
13 cation, multidisciplinary, collaborative research, de-
14 velopment, demonstration, and commercial applica-
15 tion of advanced energy technologies.

16 (2) TECHNOLOGY DEVELOPMENT FOCUS.—The
17 Secretary shall designate for each Hub a unique ad-
18 vanced energy technology focus.

19 (3) COORDINATION.—The Secretary shall en-
20 sure the coordination of, and avoid unnecessary du-
21 plication of, the activities of Hubs with those of
22 other Department of Energy research entities, in-
23 cluding the National Laboratories, the Advanced Re-
24 search Projects Agency-Energy, Energy Frontier Re-
25 search Centers, and within industry.

1 (b) CONSORTIA.—

2 (1) ELIGIBILITY.—To be eligible to receive an
3 award under this section for the establishment and
4 operation of a Hub, a consortium shall—

5 (A) be composed of no fewer than 2 quali-
6 fying entities; and

7 (B) operate subject to an agreement en-
8 tered into by its members that documents—

9 (i) the proposed partnership agree-
10 ment, including the governance and man-
11 agement structure of the Hub;

12 (ii) measures to enable cost-effective
13 implementation of the program under this
14 section;

15 (iii) a proposed budget, including fi-
16 nancial contributions from non-Federal
17 sources;

18 (iv) a plan for managing intellectual
19 property rights; and

20 (v) an accounting structure that en-
21 ables the Secretary to ensure that the con-
22 sortium has complied with the require-
23 ments of this section.

24 (2) APPLICATION.—A consortium seeking to es-
25 tablish and operate a Hub under this section, acting

1 through a prime applicant, shall transmit to the Sec-
2 retary an application at such time, in such form,
3 and accompanied by such information as the Sec-
4 retary shall require, including a detailed description
5 of the elements of the consortium agreement re-
6 quired under paragraph (1)(B). If the consortium
7 members will not be located at one centralized loca-
8 tion, such application shall include a communica-
9 tions plan that ensures close coordination and inte-
10 gration of the Hub's activities.

11 (c) SELECTION AND SCHEDULE.—The Secretary
12 shall select consortia for awards for the establishment and
13 operation of Hubs through competitive selection processes.
14 In selecting consortia, the Secretary shall consider the in-
15 formation a consortium must disclose according to sub-
16 section (b), as well as any existing facilities a consortium
17 will provide for Hub activities. Awards made to a Hub
18 shall be for a period not to exceed 5 years, after which
19 the award may be renewed, subject to a rigorous merit
20 review. A Hub already in existence on the date of enact-
21 ment of this Act may continue to receive support for a
22 period of 5 years beginning on the date of establishment
23 of that Hub.

24 (d) HUB OPERATIONS.—

1 (1) IN GENERAL.—Each Hub shall conduct or
2 provide for multidisciplinary, collaborative research,
3 development, demonstration, and, where appropriate,
4 commercial application of advanced energy tech-
5 nologies within the technology development focus
6 designated under subsection (a)(2). Each Hub
7 shall—

8 (A) encourage collaboration and commu-
9 nication among the member qualifying entities
10 of the consortium and awardees by conducting
11 activities whenever practicable at one central-
12 ized location;

13 (B) develop and publish on the Depart-
14 ment of Energy’s website proposed plans and
15 programs;

16 (C) submit an annual report to the Sec-
17 retary summarizing the Hub’s activities, includ-
18 ing detailing organizational expenditures, and
19 describing each project undertaken by the Hub;
20 and

21 (D) monitor project implementation and
22 coordination.

23 (2) CONFLICTS OF INTEREST.—

24 (A) PROCEDURES.—Hubs shall maintain
25 conflict of interest procedures, consistent with

1 those of the Department of Energy, to ensure
2 that employees and consortia designees for Hub
3 activities who are in decisionmaking capacities
4 disclose all material conflicts of interest.

5 (B) DISQUALIFICATION AND REVOCA-
6 TION.—The Secretary may disqualify an appli-
7 cation or revoke funds distributed to a Hub if
8 the Secretary discovers a failure to comply with
9 conflict of interest procedures established under
10 subparagraph (A).

11 (3) PROHIBITION ON CONSTRUCTION.—

12 (A) IN GENERAL.—No funds provided pur-
13 suant to this section may be used for construc-
14 tion of new buildings or facilities for Hubs.
15 Construction of new buildings or facilities shall
16 not be considered as part of the non-Federal
17 share of a Hub cost-sharing agreement.

18 (B) TEST BED AND RENOVATION EXCEP-
19 TION.—Nothing in this subsection shall prohibit
20 the use of funds provided pursuant to this sec-
21 tion, or non-Federal cost share funds, for re-
22 search or for the construction of a test bed or
23 renovations to existing buildings or facilities for
24 the purposes of research if the Secretary deter-
25 mines that the test bed or renovations are lim-

1 ited to a scope and scale necessary for the re-
2 search to be conducted.

3 (e) TERMINATION.—Consistent with the existing au-
4 thorities of the Department, the Secretary may terminate
5 an underperforming Hub for cause during the perform-
6 ance period.

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

8 (1) ADVANCED ENERGY TECHNOLOGY.—The
9 term “advanced energy technology” means—

10 (A) an innovative technology—

11 (i) that produces energy from solar,
12 wind, geothermal, biomass, tidal, wave,
13 ocean, or other renewable energy resources;

14 (ii) that produces nuclear energy;

15 (iii) for carbon capture and sequestra-
16 tion;

17 (iv) that enables advanced vehicles,
18 vehicle components, and related tech-
19 nologies that result in significant energy
20 savings;

21 (v) that generates, transmits, distrib-
22 utes, utilizes, or stores energy more effi-
23 ciently than conventional technologies, in-
24 cluding through Smart Grid technologies;

25 or

1 (vi) that enhances the energy inde-
2 pendence and security of the United States
3 by enabling improved or expanded supply
4 and production of domestic energy re-
5 sources, including coal, oil, and natural
6 gas;

7 (B) research, development, demonstration,
8 and commercial application activities necessary
9 to ensure the long-term, secure, and sustainable
10 supply of energy critical elements; or

11 (C) another innovative energy technology
12 area identified by the Secretary.

13 (2) ENERGY CRITICAL ELEMENT.—The term
14 “energy critical element” means any of a class of
15 chemical elements that have a high risk of a supply
16 disruption and are critical to one or more new, en-
17 ergy-related technologies such that a shortage of
18 such element would significantly inhibit large-scale
19 deployment of technologies that produce, transmit,
20 store, or conserve energy.

21 (3) HUB.—The term “Hub” means an Energy
22 Innovation Hub established or operating in accord-
23 ance with this section, including any Energy Innova-
24 tion Hub existing as of the date of enactment of this
25 Act.

1 (4) QUALIFYING ENTITY.—The term “quali-
2 fying entity” means—

3 (A) an institution of higher education;

4 (B) an appropriate State or Federal entity,
5 including the Department of Energy Federally
6 Funded Research and Development Centers;

7 (C) a nongovernmental organization with
8 expertise in advanced energy technology re-
9 search, development, demonstration, or com-
10 mercial application; or

11 (D) any other relevant entity the Secretary
12 considers appropriate.

13 **SEC. 642. PARTICIPATION IN THE INNOVATION CORPS PRO-**
14 **GRAM.**

15 (a) AGREEMENT.—The Secretary of Energy shall
16 enter into an agreement with the Director of the National
17 Science Foundation to enable researchers funded by the
18 Department of Energy to participate in the Innovation
19 Corps program authorized by section 307.

20 (b) AUTHORIZATION.—The Secretary of Energy may
21 also establish a Department of Energy Innovation Corps
22 program, modeled after the National Science Foundation
23 Innovation Corps program, to incorporate experts from
24 the Department of Energy National Laboratories in the
25 training curriculum of the program.

1 **SEC. 643. TECHNOLOGY TRANSFER.**

2 (a) REPORT.—Not later than 1 year after the date
3 of enactment of this Act, and annually thereafter, the Sec-
4 retary of Energy shall transmit to the Committee on
5 Science, Space, and Technology of the House of Rep-
6 resentatives and the Committee on Energy and Natural
7 Resources of the Senate a report which shall include—

8 (1) an assessment of the Department’s current
9 ability to carry out the goals of section 1001 of the
10 Energy Policy Act of 2005 (42 U.S.C. 16391), in-
11 cluding an assessment of the role and effectiveness
12 of the Director of the Office of Technology Transi-
13 tions; and

14 (2) recommended departmental policy changes
15 and legislative changes to section 1001 of the En-
16 ergy Policy Act of 2005 (42 U.S.C. 16391) to im-
17 prove the Department’s ability to successfully trans-
18 fer new energy technologies to the private sector.

19 (b) AMENDMENTS.—Section 1001 of the Energy Pol-
20 icy Act of 2005 (42 U.S.C. 16391) is amended—

21 (1) in subsection (e), by striking “for commer-
22 cial purposes” and inserting “of any sort for com-
23 mercial purposes, including energy technologies not
24 currently supported by the Department of Energy”;

25 (2) by redesignating subsections (f) and (g) as
26 subsections (h) and (i), respectively; and

1 (3) by inserting after subsection (e) the fol-
2 lowing new subsections:

3 “(f) AGREEMENTS FOR COMMERCIALIZING TECH-
4 NOLOGY PILOT PROGRAM.—

5 “(1) IN GENERAL.—The Secretary shall carry
6 out the Agreements for Commercializing Technology
7 pilot program of the Department, as announced by
8 the Secretary on December 8, 2011, in accordance
9 with this subsection.

10 “(2) TERMS.—Each agreement entered into
11 pursuant to the pilot program referred to in para-
12 graph (1) shall provide to the contractor of the ap-
13 plicable National Laboratory, to the maximum ex-
14 tent determined to be appropriate by the Secretary,
15 increased authority to negotiate contract terms, such
16 as intellectual property rights, payment structures,
17 performance guarantees, and multiparty collabora-
18 tions.

19 “(3) ELIGIBILITY.—

20 “(A) IN GENERAL.—Any director of a Na-
21 tional Laboratory may enter into an agreement
22 pursuant to the pilot program referred to in
23 paragraph (1).

24 “(B) AGREEMENTS WITH NON-FEDERAL
25 ENTITIES.—To carry out subparagraph (A) and

1 subject to subparagraph (C), the Secretary shall
2 permit the directors of the National Labora-
3 tories to execute agreements with a non-Federal
4 entity, including a non-Federal entity already
5 receiving Federal funding that will be used to
6 support activities under agreements executed
7 pursuant to subparagraph (A), provided that
8 such funding is solely used to carry out the pur-
9 poses of the Federal award.

10 “(C) RESTRICTION.—The requirements of
11 chapter 18 of title 35, United States Code
12 (commonly known as the ‘Bayh-Dole Act’) shall
13 apply if—

14 “(i) the agreement is a funding agree-
15 ment (as that term is defined in section
16 201 of that title); and

17 “(ii) at least 1 of the parties to the
18 funding agreement is eligible to receive
19 rights under that chapter.

20 “(4) SUBMISSION TO SECRETARY.—Each af-
21 fected director of a National Laboratory shall sub-
22 mit to the Secretary, with respect to each agreement
23 entered into under this subsection—

24 “(A) a summary of information relating to
25 the relevant project;

1 “(B) the total estimated costs of the
2 project;

3 “(C) estimated commencement and com-
4 pletion dates of the project; and

5 “(D) other documentation determined to
6 be appropriate by the Secretary.

7 “(5) CERTIFICATION.—The Secretary shall re-
8 quire the contractor of the affected National Labora-
9 tory to certify that each activity carried out under
10 a project for which an agreement is entered into
11 under this subsection—

12 “(A) is not in direct competition with the
13 private sector; and

14 “(B) does not present, or minimizes, any
15 apparent conflict of interest, and avoids or neu-
16 tralizes any actual conflict of interest, as a re-
17 sult of the agreement under this subsection.

18 “(6) EXTENSION.—The pilot program referred
19 to in paragraph (1) shall be extended until October
20 31, 2017.

21 “(7) REPORTS.—

22 “(A) OVERALL ASSESSMENT.—Not later
23 than 60 days after the date described in para-
24 graph (6), the Secretary, in coordination with
25 directors of the National Laboratories, shall

1 submit to the Committee on Science, Space,
2 and Technology of the House of Representa-
3 tives and the Committee on Energy and Nat-
4 ural Resources of the Senate a report that—

5 “(i) assesses the overall effectiveness
6 of the pilot program referred to in para-
7 graph (1);

8 “(ii) identifies opportunities to im-
9 prove the effectiveness of the pilot pro-
10 gram;

11 “(iii) assesses the potential for pro-
12 gram activities to interfere with the re-
13 sponsibilities of the National Laboratories
14 to the Department; and

15 “(iv) provides a recommendation re-
16 garding the future of the pilot program.

17 “(B) TRANSPARENCY.—The Secretary, in
18 coordination with directors of the National Lab-
19 oratories, shall submit to the Committee on
20 Science, Space, and Technology of the House of
21 Representatives and the Committee on Energy
22 and Natural Resources of the Senate an annual
23 report that accounts for all incidences of, and
24 provides a justification for, non-Federal entities
25 using funds derived from a Federal contract or

1 award to carry out agreements pursuant to this
2 subsection.

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 (3) AVAILABILITY OF RECORDS.—

6 (A) Not later than 7 days after the date on
7 which the director of a National Laboratory en-
8 ters into an agreement under this subsection,
9 such director shall submit to the Secretary of
10 Energy for monitoring and review all records of
11 the National Laboratory relating to the agree-
12 ment.

13 (B) Not later than 30 days after the date
14 on which the director of a specific National
15 Laboratory enters into an agreement under this
16 subsection, the Secretary may terminate the
17 agreement and the authority of any director of
18 such National Laboratory to enter into agree-
19 ments under this subsection if—

20 (i) all records of the National Labora-
21 tory relating to the agreement have not
22 been transmitted to the Secretary in ac-
23 cordance with subparagraph (A); or

1 (ii) the Secretary determines that this
2 agreement is inconsistent with the mission
3 of the Department.

4 (4) LIMITATION.—This subsection does not
5 apply to any agreement with a majority foreign-
6 owned company.

7 (5) SUNSET.—

8 (A) IN GENERAL.—This subsection shall
9 apply only during the 4-year period beginning
10 on the date of enactment of this Act.

11 (B) ASSESSMENT.—Not later than the
12 date that is 180 days prior to the last day of
13 the period described in subparagraph (A), the
14 Secretary shall submit to the Committee on
15 Science, Space, and Technology of the House of
16 Representatives and the Committee on Energy
17 and Natural Resources of the Senate an assess-
18 ment of the effectiveness of the authority pro-
19 vided to the directors of the National Labora-
20 tories under this subsection to accelerate the
21 development of new technologies, and an assess-
22 ment of any incidences of potential misuse of
23 this authority in the opinion of the Secretary.

1 **SEC. 644. FUNDING COMPETITIVENESS FOR INSTITUTIONS**
2 **OF HIGHER EDUCATION AND OTHER NON-**
3 **PROFIT INSTITUTIONS.**

4 Section 988(b) of the Energy Policy Act of 2005 (42
5 U.S.C. 16352(b)) is amended—

6 (1) in paragraph (1), by striking “Except as
7 provided in paragraphs (2) and (3)” and inserting
8 “Except as provided in paragraphs (2), (3), and
9 (4)”; and

10 (2) by adding at the end the following:

11 “(4) EXEMPTION FOR INSTITUTIONS OF HIGH-
12 ER EDUCATION AND OTHER NONPROFIT INSTITU-
13 TIONS.—

14 “(A) IN GENERAL.—Paragraph (1) shall
15 not apply to a research or development activity
16 performed by an institution of higher education
17 or nonprofit institution (as defined in section 4
18 of the Stevenson-Wydler Technology Innovation
19 Act of 1980 (15 U.S.C. 3703)).

20 “(B) TERMINATION DATE.—The exemp-
21 tion under subparagraph (A) shall apply during
22 the 6-year period beginning on the date of en-
23 actment of this paragraph.”.

1 **SEC. 645. UNDER SECRETARY FOR SCIENCE AND ENERGY.**

2 (a) IN GENERAL.—Section 202(b) of the Department
3 of Energy Organization Act (42 U.S.C. 7132(b)) is
4 amended—

5 (1) by striking “Under Secretary for Science”
6 each place it appears and inserting “Under Sec-
7 retary for Science and Energy”; and

8 (2) in paragraph (4)—

9 (A) in subparagraph (F), by striking
10 “and” at the end;

11 (B) in subparagraph (G), by striking the
12 period at the end and inserting a semicolon;
13 and

14 (C) by inserting after subparagraph (G)
15 the following:

16 “(H) establish appropriate linkages be-
17 tween offices under the jurisdiction of the
18 Under Secretary; and

19 “(I) perform such functions and duties as
20 the Secretary shall prescribe, consistent with
21 this section.”.

22 (b) CONFORMING AMENDMENTS.—

23 (1) Section 3164(b)(1) of the Department of
24 Energy Science Education Enhancement Act (42
25 U.S.C. 7381a(b)(1)) is amended by striking “Under

1 Secretary for Science” and inserting “Under Sec-
2 retary for Science and Energy”.

3 (2) Section 641(h)(2) of the United States En-
4 ergy Storage Competitiveness Act of 2007 (42
5 U.S.C. 17231(h)(2)) is amended by striking “Under
6 Secretary for Science” and inserting “Under Sec-
7 retary for Science and Energy”.

8 **SEC. 646. SPECIAL HIRING AUTHORITY FOR SCIENTIFIC,**
9 **ENGINEERING, AND PROJECT MANAGEMENT**
10 **PERSONNEL.**

11 (a) IN GENERAL.—The Under Secretary shall have
12 the authority to—

13 (1) make appointments of scientific, engineer-
14 ing, and professional personnel, without regard to
15 civil service laws, to assist the Department in meet-
16 ing specific project or research needs;

17 (2) fix the basic pay of any employee appointed
18 under this section at a rate to be determined by the
19 Under Secretary at rates not in excess of the Execu-
20 tive Schedule (EX–II) without regard to the civil
21 service laws; and

22 (3) pay any employee appointed under this sec-
23 tion payments in addition to basic pay, except that
24 the total amount of additional payments paid to an
25 employee under this subsection for any 12-month pe-

1 riod shall not exceed the least of the following
2 amounts:

3 (A) \$25,000.

4 (B) The amount equal to 25 percent of the
5 annual rate of basic pay of that employee.

6 (C) The amount of the limitation that is
7 applicable for a calendar year under section
8 5307(a)(1) of title 5, United States Code.

9 (b) TERM.—

10 (1) IN GENERAL.—The term of any employee
11 appointed under this section shall not exceed 3
12 years.

13 (2) TERMINATION.—The Under Secretary shall
14 have the authority to terminate any employee ap-
15 pointed under this section at any time based on per-
16 formance or changing project or research needs of
17 the Department.

