

113TH CONGRESS
2D SESSION

H. R. 4869

To provide for Department of Energy fundamental science, basic research activities, and applied energy research and development.

IN THE HOUSE OF REPRESENTATIVES

JUNE 13, 2014

Mrs. LUMMIS (for herself, Mr. SMITH of Texas, Mr. WEBER of Texas, Mr. HALL, Mr. CRAMER, and Mr. STOCKMAN) introduced the following bill; which was referred to the Committee on Science, Space, and Technology

A BILL

To provide for Department of Energy fundamental science, basic research activities, and applied energy research and development.

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

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

4 (a) SHORT TITLE.—This Act may be cited as the
5 “Department of Energy Research and Development Act
6 of 2014”.

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

Sec. 1. Short title; table of contents.

TITLE I—EINSTEIN ACT

Sec. 101. Short title.

Subtitle A—Office of Science

- Sec. 111. Mission.
- Sec. 112. Basic energy sciences.
- Sec. 113. Advanced scientific computing research.
- Sec. 114. High energy physics.
- Sec. 115. Biological and environmental research.
- Sec. 116. Fusion energy.
- Sec. 117. Nuclear physics.
- Sec. 118. Science laboratories infrastructure program.
- Sec. 119. Authorization of appropriations.

Subtitle B—Miscellaneous

- Sec. 121. Transparency.
- Sec. 122. National Energy Technology Laboratory.
- Sec. 123. Savings clause.
- Sec. 124. Under Secretary for Science and Energy.
- Sec. 125. National Laboratories operations and performance management.
- Sec. 126. Sense of Congress on an integrated strategy for National Laboratories in the 21st century.
- Sec. 127. Agreements for Commercializing Technology pilot program.
- Sec. 128. Technology transfer.
- Sec. 129. Inclusion of early-stage technology demonstration in authorized technology transfer activities.
- Sec. 130. Funding competitiveness for institutions of higher education and other nonprofit institutions.
- Sec. 131. Report by Government Accountability Office.
- Sec. 132. Definitions.

TITLE II—ONE FUTURE

Sec. 201. Short title.

Subtitle A—Crosscutting Research and Development

- Sec. 211. Crosscutting research and development.
- Sec. 212. Strategic research portfolio analysis and coordination plan.
- Sec. 213. Strategy for facilities and infrastructure.
- Sec. 214. Distributed energy and electric energy systems.
- Sec. 215. Distributed energy technology coordinating consortia.
- Sec. 216. Electric transmission and distribution research and development.

Subtitle B—Nuclear Energy Research and Development

- Sec. 221. Objectives.
- Sec. 222. Program objectives study.
- Sec. 223. Nuclear energy research and development programs.
- Sec. 224. Small modular reactor program.
- Sec. 225. Conventional improvements to nuclear power plants.
- Sec. 226. Fuel cycle research and development.
- Sec. 227. Nuclear energy enabling technologies program.
- Sec. 228. Technical standards collaboration.
- Sec. 229. Evaluation of long-term operating needs.

- Sec. 230. Available facilities database.
 Sec. 231. Nuclear waste disposal.

Subtitle C—Energy Efficiency and Renewable Energy Research and
 Development

- Sec. 241. Energy efficiency.
 Sec. 242. Next Generation Lighting Initiative.
 Sec. 243. Building standards.
 Sec. 244. Secondary electric vehicle battery use program.
 Sec. 245. Energy Efficiency Science Initiative.
 Sec. 246. Advanced Energy Technology Transfer Centers.
 Sec. 247. Renewable energy.
 Sec. 248. Bioenergy program.
 Sec. 249. Concentrating solar power research program.
 Sec. 250. Renewable energy in public buildings.

Subtitle D—Fossil Energy Research and Development

- Sec. 261. Fossil energy.
 Sec. 262. Pioneering Energy Research.
 Sec. 263. Research, development, demonstration, and commercial application
 programs.
 Sec. 264. High efficiency gas turbines research and development.

Subtitle E—Advanced Research Projects Agency—Energy

- Sec. 281. ARPA—E amendments.

Subtitle F—Miscellaneous

- Sec. 291. Authorization of appropriations.
 Sec. 292. Definitions.

1 **TITLE I—EINSTEIN ACT**

2 **SEC. 101. SHORT TITLE.**

3 This title may be cited as the “Enabling Innovation
 4 for Science, Technology, and Energy in America Act of
 5 2014” or the “EINSTEIN Act”.

6 **Subtitle A—Office of Science**

7 **SEC. 111. MISSION.**

8 Section 209 of the Department of Energy Organiza-
 9 tion Act (42 U.S.C. 7139) is amended by adding at the
 10 end the following:

1 “(c) MISSION.—The mission of the Office of Science
2 shall be the delivery of scientific discoveries, capabilities,
3 and major scientific tools to transform the understanding
4 of nature and to advance the energy, economic, and na-
5 tional security of the United States. In support of this
6 mission, the Director shall carry out programs on basic
7 energy sciences, advanced scientific computing research,
8 high energy physics, biological and environmental re-
9 search, fusion energy sciences, and nuclear physics, includ-
10 ing as provided under subtitle A of the Enabling Innova-
11 tion for Science, Technology, and Energy in America Act
12 of 2014, through activities focused on—

13 “(1) fundamental scientific discoveries through
14 the study of matter and energy;

15 “(2) science for national need, including—

16 “(A) advancing an agenda for American
17 energy independence through research on en-
18 ergy production, storage, transmission, effi-
19 ciency, and use; and

20 “(B) advancing our understanding of the
21 Earth’s climate through research in atmos-
22 pheric and environmental sciences; and

23 “(3) National Scientific User Facilities to de-
24 liver the 21st century tools of science, engineering,
25 and technology and provide the Nation’s researchers

1 with the most advanced tools of modern science in-
2 cluding accelerators, colliders, supercomputers, light
3 sources and neutron sources, and facilities for study-
4 ing materials science.

5 “(d) COORDINATION WITH OTHER DEPARTMENT OF
6 ENERGY PROGRAMS.—The Under Secretary for Science
7 and Energy shall ensure the coordination of Office of
8 Science activities and programs with other activities of the
9 Department.”.

10 **SEC. 112. BASIC ENERGY SCIENCES.**

11 (a) PROGRAM.—The Director shall carry out a pro-
12 gram in basic energy sciences, including materials sciences
13 and engineering, chemical sciences, physical biosciences,
14 and geosciences, for the purpose of providing the scientific
15 foundations for new energy technologies.

16 (b) MISSION.—The mission of the program described
17 in subsection (a) shall be to support fundamental research
18 to understand, predict, and ultimately control matter and
19 energy at the electronic, atomic, and molecular levels in
20 order to provide the foundations for new energy tech-
21 nologies and to support Department missions in energy,
22 environment, and national security.

23 (c) BASIC ENERGY SCIENCES USER FACILITIES.—
24 The Director shall carry out a subprogram for the develop-
25 ment, construction, operation, and maintenance of na-

1 tional user facilities to support the program under this
2 section. As practicable, these facilities shall serve the
3 needs of the Department, industry, the academic commu-
4 nity, and other relevant entities to create and examine new
5 materials and chemical processes for the purposes of ad-
6 vancing new energy technologies and improving the com-
7 petitiveness of the United States. These facilities shall in-
8 clude—

- 9 (1) x-ray light sources;
- 10 (2) neutron sources;
- 11 (3) nanoscale science research centers; and
- 12 (4) other facilities the Director considers appro-
13 priate, consistent with section 209 of the Depart-
14 ment of Energy Organization Act (42 U.S.C. 7139).

15 (d) LIGHT SOURCE LEADERSHIP INITIATIVE.—

16 (1) ESTABLISHMENT.—In support of the sub-
17 program authorized in subsection (c), the Director
18 shall establish an initiative to sustain and advance
19 global leadership of light source user facilities.

20 (2) LEADERSHIP STRATEGY.—Not later than 9
21 months after the date of enactment of this Act, and
22 biennially thereafter, the Director shall prepare, in
23 consultation with relevant stakeholders, and submit
24 to the Committee on Science, Space, and Technology
25 of the House of Representatives and the Committee

1 on Energy and Natural Resources of the Senate a
2 light source leadership strategy that—

3 (A) identifies, prioritizes, and describes
4 plans for the development, construction, and op-
5 eration of light sources over the next decade;

6 (B) describes plans for optimizing manage-
7 ment and use of existing light source facilities;
8 and

9 (C) assesses the international outlook for
10 light source user facilities and describes plans
11 for United States cooperation in such projects.

12 (3) ADVISORY COMMITTEE FEEDBACK AND
13 RECOMMENDATIONS.—Not later than 45 days after
14 submission of the strategy described in paragraph
15 (2), the Basic Energy Sciences Advisory Committee
16 shall provide the Director, the Committee on
17 Science, Space, and Technology of the House of
18 Representatives, and the Committee on Energy and
19 Natural Resources of the Senate a report of the Ad-
20 visory Committee’s analyses, findings, and rec-
21 ommendations for improving the strategy, including
22 a review of the most recent budget request for the
23 initiative.

24 (4) PROPOSED BUDGET.—The Director shall
25 transmit annually to Congress a proposed budget

1 corresponding to the activities identified in the strat-
2 egy.

3 (e) ACCELERATOR RESEARCH AND DEVELOP-
4 MENT.—The Director shall carry out research and devel-
5 opment on advanced accelerator and storage ring tech-
6 nologies relevant to the development of Basic Energy
7 Sciences user facilities, in consultation with the Office of
8 Science’s High Energy Physics and Nuclear Physics pro-
9 grams.

10 (f) EPSCoR.—

11 (1) CONTINUATION OF PROGRAM.—The Sec-
12 retary shall continue to carry out the Experimental
13 Program to Stimulate Competitive Research, estab-
14 lished at the Department of Energy under section
15 2203(b)(3) of the Energy Policy Act of 1992 (42
16 U.S.C. 13503(b)(3)) (in this subsection referred to
17 as “EPSCoR”), with the objective of expanding the
18 research capabilities of the eligible States to enable
19 them to better address the many energy and energy-
20 related issues that confront their States and the Na-
21 tion on a daily basis.

22 (2) REPRESENTATION.—Advisory committees,
23 workshops, and review panels are critical tools to
24 help the Department to make sound decisions about
25 how to best spend research and development funds,

1 as well as to identify other opportunities to advance
2 the Department's research priorities. The Secretary
3 shall ensure that the process for nominating mem-
4 bers to such advisory committees and review panels
5 considers candidates from a broad range of geo-
6 graphic locations, with an objective of reflecting an
7 expansive geographic distribution of research univer-
8 sities.

9 (3) CONGRESSIONAL REPORTS.—The Director
10 shall report to the Committee on Science, Space, and
11 Technology of the House of Representatives and the
12 Committee on Energy and Natural Resources of the
13 Senate on an annual basis, using the most recent
14 available data, on—

15 (A) the total research funding made avail-
16 able by the Department to each State in the
17 Nation;

18 (B) the total amount of research funding
19 made available, by State, under EPSCoR;

20 (C) the total amount of Department re-
21 search funding made available to all institutions
22 and entities within EPSCoR States;

23 (D) a breakdown of the EPSCoR funds
24 spent in each subject matter area;

1 (E) the geographic breakdown of members
2 of the Department's research advisory boards;
3 and

4 (F) efforts and accomplishments to more
5 fully integrate the EPSCoR States in major ac-
6 tivities and initiatives of the Department.

7 (4) AUTHORIZATION OF APPROPRIATIONS.—
8 There are authorized to be appropriated to the Sec-
9 retary of Energy for the EPSCoR program for fiscal
10 year 2015, \$22,000,000.

11 **SEC. 113. ADVANCED SCIENTIFIC COMPUTING RESEARCH.**

12 (a) PROGRAM.—The Director shall carry out a re-
13 search, development, demonstration, and commercial ap-
14 plication program to advance computational and net-
15 working capabilities to analyze, model, simulate, and pre-
16 dict complex phenomena relevant to the development of
17 new energy technologies and the competitiveness of the
18 United States.

19 (b) FACILITIES.—The Director, as part of the pro-
20 gram described in subsection (a), shall develop and main-
21 tain world-class computing and network facilities for
22 science and deliver critical research in applied mathe-
23 matics, computer science, and advanced networking to
24 support the Department's missions.

1 (c) DEFINITIONS.—Section 2 of the Department of
2 Energy High-End Computing Revitalization Act of 2004
3 (15 U.S.C. 5541) is amended by striking paragraphs (1)
4 through (5) and inserting the following:

5 “(1) CO-DESIGN.—The term ‘co-design’ means
6 the joint development of application algorithms,
7 models, and codes with computer technology archi-
8 tectures and operating systems to maximize effective
9 use of high-end computing systems.

10 “(2) DEPARTMENT.—The term ‘Department’
11 means the Department of Energy.

12 “(3) EXASCALE.—The term ‘exascale’ means
13 computing system performance at or near 10 to the
14 18th power floating point operations per second.

15 “(4) HIGH-END COMPUTING SYSTEM.—The
16 term ‘high-end computing system’ means a com-
17 puting system with performance that substantially
18 exceeds that of systems that are commonly available
19 for advanced scientific and engineering applications.

20 “(5) INSTITUTION OF HIGHER EDUCATION.—
21 The term ‘institution of higher education’ has the
22 meaning given the term in section 101(a) of the
23 Higher Education Act of 1965 (20 U.S.C. 1001(a)).

24 “(6) LEADERSHIP SYSTEM.—The term ‘Leader-
25 ship System’ means a high-end computing system

1 that is among the most advanced in the world in
2 terms of performance in solving scientific and engi-
3 neering problems.

4 “(7) NATIONAL LABORATORY.—The term ‘Na-
5 tional Laboratory’ means any one of the seventeen
6 laboratories owned by the Department.

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

9 “(9) SOFTWARE TECHNOLOGY.—The term
10 ‘software technology’ includes optimal algorithms,
11 programming environments, tools, languages, and
12 operating systems for high-end computing systems.”.

13 (d) DEPARTMENT OF ENERGY HIGH-END COM-
14 PUTING RESEARCH AND DEVELOPMENT PROGRAM.—Sec-
15 tion 3 of the Department of Energy High-End Computing
16 Revitalization Act of 2004 (15 U.S.C. 5542) is amended—

17 (1) in subsection (a)—

18 (A) in paragraph (1), by striking “pro-
19 gram” and inserting “coordinated program
20 across the Department”;

21 (B) by striking “and” at the end of para-
22 graph (1);

23 (C) by striking the period at the end of
24 paragraph (2) and inserting “; and”; and

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

3 “(3) partner with universities, National Labora-
4 tories, and industry to ensure the broadest possible
5 application of the technology developed in this pro-
6 gram to other challenges in science, engineering,
7 medicine, and industry.”;

8 (2) in subsection (b)(2), by striking “vector”
9 and all that follows through “architectures” and in-
10 sserting “computer technologies that show promise of
11 substantial reductions in power requirements and
12 substantial gains in parallelism of multicore proc-
13 essors, concurrency, memory and storage, band-
14 width, and reliability”;

15 (3) by striking subsection (b)(3) and inserting
16 the following paragraph:

17 “(3) in concert with architecture development
18 efforts, conduct research in applied mathematics,
19 computer science, and software development, includ-
20 ing—

21 “(A) research on operating systems, pro-
22 gramming environments, and languages to sup-
23 port advanced architectures; and

24 “(B) research on mathematical modeling
25 and computational algorithms that enable sim-

1 ulation and data analysis of large-scale sci-
2 entific problems and design of engineered sys-
3 tems on advanced architectures;”); and

4 (4) by striking subsection (d) and inserting the
5 following:

6 “(d) EXASCALE COMPUTING PROGRAM.—

7 “(1) IN GENERAL.—The Secretary shall con-
8 duct a coordinated research and development pro-
9 gram to develop exascale computing systems to ad-
10 vance the missions of the Department.

11 “(2) EXECUTION.—The Secretary shall, on a
12 competitive, merit-reviewed basis, establish 2 or
13 more National Laboratory-industry-university part-
14 nerships to conduct integrated research, develop-
15 ment, and engineering of multiple exascale architec-
16 tures, and—

17 “(A) conduct mission-related co-design ac-
18 tivities in developing exascale platforms;

19 “(B) develop those advancements in hard-
20 ware and software technology required to fully
21 realize the potential of an exascale production
22 system in addressing Department target appli-
23 cations and solving scientific problems involving
24 predictive modeling and simulation and large-
25 scale data analytics and management; and

1 “(C) explore the use of exascale computing
2 technologies to advance a broad range of
3 science and engineering.

4 “(3) ADMINISTRATION.—In carrying out this
5 program, the Secretary shall—

6 “(A) provide, on a competitive, merit-re-
7 viewed basis, access for researchers in United
8 States industry, institutions of higher edu-
9 cation, National Laboratories, and other Fed-
10 eral agencies to exascale systems, as appro-
11 priate; and

12 “(B) conduct outreach programs to in-
13 crease the readiness for the use of exascale
14 platforms by domestic industries, including
15 manufacturers.

16 “(4) REPORTS.—

17 “(A) INTEGRATED STRATEGY AND PRO-
18 GRAM MANAGEMENT PLAN.—The Secretary
19 shall submit to Congress, not later than 90
20 days after the date of enactment of the Ena-
21 bling Innovation for Science, Technology, and
22 Energy in America Act of 2014, a report out-
23 lining an integrated strategy and program man-
24 agement plan, including target dates for
25 prototypical and production exascale platforms,

1 interim milestones to reaching these targets,
2 functional requirements, roles and responsibil-
3 ities of National Laboratories and industry, ac-
4 quisition strategy, and estimated resources re-
5 quired, to achieve this exascale system capa-
6 bility. The report shall include the Secretary’s
7 plan for Departmental organization to manage
8 and execute the Exascale Computing Program,
9 including definition of the roles and responsibil-
10 ities within the Department to ensure an inte-
11 grated program across the Department. The re-
12 port shall also include a plan for ensuring bal-
13 ance and prioritizing across ASCR subprograms
14 in a flat or slow-growth budget environment.

15 “(B) STATUS REPORTS.—At the time of
16 the budget submission of the Department for
17 each fiscal year, the Secretary shall submit a
18 report to Congress that describes the status of
19 milestones and costs in achieving the objectives
20 of the exascale computing program.

21 “(C) EXASCALE MERIT REPORT.—At least
22 18 months prior to the initiation of construction
23 or installation of any exascale-class computing
24 facility, the Secretary shall transmit a plan to
25 the Congress detailing—

1 “(i) the proposed facility’s cost projec-
2 tions and capabilities to significantly accel-
3 erate the development of new energy tech-
4 nologies;

5 “(ii) technical risks and challenges
6 that must be overcome to achieve success-
7 ful completion and operation of the facility;
8 and

9 “(iii) an independent assessment of
10 the scientific and technological advances
11 expected from such a facility relative to
12 those expected from a comparable invest-
13 ment in expanded research and applica-
14 tions at terascale-class and petascale-class
15 computing facilities, including an evalua-
16 tion of where investments should be made
17 in the system software and algorithms to
18 enable these advances.”.

19 **SEC. 114. HIGH ENERGY PHYSICS.**

20 (a) PROGRAM.—The Director shall carry out a re-
21 search program on the elementary constituents of matter
22 and energy and the nature of space and time.

23 (b) UNDERGROUND SCIENCE.—

24 (1) PURPOSE.—The Director shall create, pre-
25 serve, and maintain United States facilities essential

1 to underground scientific research supported by the
2 Department.

3 (2) REPORT.—Not later than 120 days after
4 the date of enactment of this Act, and biennially
5 thereafter, the Director shall submit to the Com-
6 mittee on Science, Space, and Technology of the
7 House of Representatives and the Committee on En-
8 ergy and Natural Resources of the Senate a report
9 on the activities to steward national leadership in
10 underground science, including—

11 (A) methods for coordination between ac-
12 tivities carried out under this section and activi-
13 ties carried out under section 117;

14 (B) demonstration of engagement with
15 other relevant Federal agencies, including the
16 National Science Foundation;

17 (C) plans for sustaining and advancing
18 United States leadership in underground
19 science, particularly as they relate to develop-
20 ment of scientific user facilities to explore the
21 frontiers of particle physics and science in gen-
22 eral; and

23 (D) identification of priorities in the area
24 of underground science, taking into consider-

1 ation previous Department and National Re-
2 search Council reports.

3 (3) GRANTS IN SUPPORT OF UNDERGROUND
4 SCIENCE.—The Director shall carry out a competi-
5 tive program to award grants to scientists and engi-
6 neers at institutions of higher education, nonprofit
7 institutions, and National Laboratories to conduct
8 research in underground science.

9 (4) TRANSFER OF STEWARDSHIP.—If the De-
10 partment determines that one or more underground
11 research facilities are no longer required to carry out
12 the program described in this section, the Secretary
13 may designate another appropriate steward of un-
14 derground research facilities. If such stewardship is
15 transferred, the Secretary shall provide notification
16 to Congress within 30 days.

17 (c) ACCELERATOR RESEARCH AND DEVELOP-
18 MENT.—The Director shall carry out research and devel-
19 opment in advanced accelerator concepts and technologies,
20 including laser technologies, to reduce the necessary scope
21 and cost for the next generation of particle accelerators.

22 **SEC. 115. BIOLOGICAL AND ENVIRONMENTAL RESEARCH.**

23 (a) PROGRAM.—The Director shall carry out a pro-
24 gram of research, development, and demonstration in the
25 areas of biological systems science and climate and envi-

1 ronmental science to support the energy and environ-
2 mental missions of the Department.

3 (b) PRIORITY RESEARCH.—In carrying out this sec-
4 tion, the Director shall prioritize fundamental research on
5 biological systems and genomics science with the greatest
6 potential to enable technological solutions for American
7 energy independence.

8 (c) ASSESSMENT.—Not later than 12 months after
9 the date of enactment of this Act, the Comptroller General
10 shall submit a report to Congress identifying climate
11 science-related initiatives under this section that overlap
12 or duplicate initiatives of other Federal agencies and the
13 extent of such overlap or duplication.

14 (d) LIMITATION.—The Director shall not approve
15 new climate science-related initiatives to be carried out
16 through the Office of Science without making a determina-
17 tion that such work is unique and not duplicative of work
18 by other Federal agencies. Not later than 3 months after
19 receiving the assessment required under subsection (c),
20 the Director shall cease those climate science-related ini-
21 tiatives identified in the assessment as overlapping or du-
22 plicative, unless the Director justifies that such work is
23 critical to achieving American energy independence.

24 (e) LOW DOSE RADIATION RESEARCH PROGRAM.—

1 (1) IN GENERAL.—The Director shall carry out
2 a research program on low dose radiation. The pur-
3 pose of the program is to enhance the scientific un-
4 derstanding of and reduce uncertainties associated
5 with the effects of exposure to low dose radiation in
6 order to inform improved risk management methods.

7 (2) STUDY.—Not later than 60 days after the
8 date of enactment of this Act, the Director shall
9 enter into an agreement with the National Acad-
10 emies to conduct a study assessing the current sta-
11 tus and development of a long-term strategy for low
12 dose radiation research. The study shall be con-
13 ducted in coordination with Federal agencies that
14 perform ionizing radiation effects research and shall
15 leverage the most current studies in this field. Such
16 study shall—

17 (A) identify current scientific challenges
18 for understanding the long-term effects of ion-
19 izing radiation;

20 (B) assess the status of current low dose
21 radiation research in the United States and
22 internationally;

23 (C) formulate overall scientific goals for
24 the future of low-dose radiation research in the
25 United States;

1 (D) recommend a long-term strategic and
2 prioritized research agenda to address scientific
3 research goals for overcoming the identified sci-
4 entific challenges in coordination with other re-
5 search efforts;

6 (E) define the essential components of a
7 research program that would address this re-
8 search agenda within the universities and the
9 National Laboratories; and

10 (F) assess the cost-benefit effectiveness of
11 such a program.

12 (3) RESEARCH PLAN.—Not later than 90 days
13 after the completion of the study performed under
14 paragraph (2) the Secretary shall deliver to the
15 Committee on Science, Space, and Technology of the
16 House of Representatives and the Committee on En-
17 ergy and Natural Resources of the Senate a 5-year
18 research plan that responds to the study’s findings
19 and recommendations and identifies and prioritizes
20 research needs.

21 (4) DEFINITION.—In this subsection, the term
22 “low dose radiation” means a radiation dose of less
23 than 100 millisieverts.

1 (5) PROHIBITION ON BIOMEDICAL RESEARCH.—
2 Section 977(e) of the Energy Policy Act of 2005 (42
3 U.S.C. 16317(e)) is amended to read as follows:

4 “(e) PROHIBITION ON BIOMEDICAL RESEARCH.—In
5 carrying out the program under this section, the Secretary
6 shall not conduct biomedical research.”.

7 **SEC. 116. FUSION ENERGY.**

8 (a) PROGRAM.—The Director shall carry out a fusion
9 energy sciences research program to expand the funda-
10 mental understanding of plasmas and matter at very high
11 temperatures and densities and to build the scientific
12 foundation necessary to enable fusion power.

13 (b) PLAN.—Not later than 12 months after the date
14 of enactment of this Act, the Director shall prepare, in
15 consultation with relevant stakeholders including experts
16 in fusion science and technology and engineering and oper-
17 ations, and submit to the Committee on Science, Space,
18 and Technology of the House of Representatives and the
19 Committee on Energy and Natural Resources of the Sen-
20 ate a plan to carry out the program set forth in subsection

21 (a). The plan shall—

22 (1) outline the tasks required to resolve the re-
23 maining scientific, engineering, and materials chal-
24 lenges, including a schedule for accomplishing these
25 tasks under various budget scenarios;

1 (2) identify priorities for initiation of facility
2 construction and facility decommissioning under var-
3 ious budget scenarios;

4 (3) specify how existing domestic experimental
5 capabilities and United States participation in the
6 ITER project contribute to this effort, and what ad-
7 ditional capabilities, including facilities for materials,
8 plasma confinement, and fusion technologies and ad-
9 vances in large scale computer simulations may be
10 needed within the United States;

11 (4) provide a strategy to develop conceptual de-
12 signs for building a demonstration power plant in-
13 cluding the associated cost and schedule under var-
14 ious budget scenarios, and address considerations
15 with respect to operability, reliability, and maintain-
16 ability; and

17 (5) describe options of involving international
18 partners or collaborators and explain how such part-
19 nerships or collaborations might be leveraged to de-
20 crease costs or accelerate the schedule while enhanc-
21 ing United States leadership in fusion science and
22 technology.

23 (c) ADVISORY COMMITTEE REPORT AND REC-
24 COMMENDATIONS.—Not later than 120 days after submis-
25 sion of the plan required under subsection (b), the Depart-

1 ment's Fusion Energy Science Advisory Committee shall
2 provide the Director, the Committee on Science, Space,
3 and Technology of the House of Representatives, and the
4 Committee on Energy and Natural Resources of the Sen-
5 ate a report of its findings, analyses, and recommenda-
6 tions to improve the plan, including a review of the most
7 recent budget request.

8 (d) ITER STUDY.—The Comptroller General shall
9 conduct a study to identify uncertainties and the outlook
10 regarding on-schedule completion of the International
11 Thermonuclear Experimental Reactor. The study shall re-
12 view, examine, and investigate any management and tech-
13 nical challenges, as well as financial risks, associated with
14 the International Thermonuclear Experimental Reactor.
15 Not later than 6 months after the date of enactment of
16 this Act, the Comptroller General shall submit a report
17 to Congress on the results of the study.

18 **SEC. 117. NUCLEAR PHYSICS.**

19 (a) PROGRAM.—The Director shall carry out a pro-
20 gram of experimental and theoretical research, and sup-
21 port associated facilities, to discover, explore, and under-
22 stand all forms of nuclear matter.

23 (b) ISOTOPE DEVELOPMENT AND PRODUCTION FOR
24 RESEARCH APPLICATIONS.—The Director shall carry out
25 a program for the production of isotopes, including the

1 development of techniques to produce isotopes, that the
2 Secretary determines are needed for research, medical, in-
3 dustrial, or other purposes. In making this determination,
4 the Secretary shall—

5 (1) ensure that, as has been the policy of the
6 United States since the publication in 1965 of Fed-
7 eral Register notice 30 Fed. Reg. 3247, isotope pro-
8 duction activities do not compete with private indus-
9 try unless critical national interests necessitate the
10 Federal Government’s involvement;

11 (2) ensure that activities undertaken pursuant
12 to this section, to the extent practicable, promote the
13 growth of a robust domestic isotope production in-
14 dustry; and

15 (3) consider any relevant recommendations
16 made by Federal advisory committees, the National
17 Academies, and interagency working groups in which
18 the Department participates.

19 **SEC. 118. SCIENCE LABORATORIES INFRASTRUCTURE PRO-**
20 **GRAM.**

21 (a) PROGRAM.—The Director shall carry out a pro-
22 gram to improve the safety, efficiency, and mission readi-
23 ness of infrastructure at Office of Science laboratories.
24 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 **SEC. 119. AUTHORIZATION OF APPROPRIATIONS.**

19 (a) FISCAL YEAR 2014.—There are authorized to be
20 appropriated to the Secretary for the Office of Science for
21 fiscal year 2014 \$5,071,000,000, of which—

22 (1) \$1,712,757,000 shall be for Basic Energy
23 Science;

24 (2) \$797,521,000 shall be for High Energy
25 Physics;

1 (3) \$610,196,000 shall be for Biological and
2 Environmental Research;

3 (4) \$569,938,000 shall be for Nuclear Physics;

4 (5) \$478,593,000 shall be for Advanced Sci-
5 entific Computing Research;

6 (6) \$505,677,000 shall be for Fusion Energy
7 Sciences;

8 (7) \$97,818,000 shall be for Science Labora-
9 tories Infrastructure;

10 (8) \$185,000,000 shall be for Science Program
11 Direction;

12 (9) \$87,000,000 shall be for Safeguards and
13 Security; and

14 (10) \$26,500,000 shall be for Workforce Devel-
15 opment for Teachers and Scientists.

16 (b) FISCAL YEAR 2015.—There are authorized to be
17 appropriated to the Secretary for the Office of Science for
18 fiscal year 2015 \$5,324,550,000, of which—

19 (1) \$1,900,000,000 shall be for Basic Energy
20 Science;

21 (2) \$825,000,000 shall be for High Energy
22 Physics;

23 (3) \$500,000,000 shall be for Biological and
24 Environmental Research;

25 (4) \$593,573,000 shall be for Nuclear Physics;

1 (5) \$600,000,000 shall be for Advanced Sci-
2 entific Computing Research;

3 (6) \$521,288,000 shall be for Fusion Energy
4 Sciences;

5 (7) \$79,189,000 shall be for Science Labora-
6 tories Infrastructure;

7 (8) \$185,000,000 shall be for Science Program
8 Direction;

9 (9) \$94,000,000 shall be for Safeguards and
10 Security; and

11 (10) \$26,500,000 shall be for Workforce Devel-
12 opment for Teachers and Scientists.

13 **Subtitle B—Miscellaneous**

14 **SEC. 121. TRANSPARENCY.**

15 (a) COST SHARE.—The Secretary shall make public
16 all cost-share waivers granted under section 988(b)(3) or
17 (c)(2) of the Energy Policy Act of 2005 (42 U.S.C.
18 16352(b)(3) or (c)(2)) not later than 30 days after the
19 waiver is issued. The information shall include—

20 (1) the name of the entity receiving the waiver;

21 (2) a justification for the reduction or elimi-
22 nation;

23 (3) the final cost share percentage;

24 (4) the amount of total cost share;

25 (5) the date when the waiver is granted; and

1 (6) a description of the supported project.

2 (b) TECHNOLOGY TRANSFER AGREEMENTS.—The
3 Secretary shall make public, not later than 30 days after
4 a National Laboratory enters into a technology transfer
5 agreement with a nongovernment entity, basic, nonpropri-
6 etary information related to such technology transfer
7 agreement, including—

8 (1) Cooperative Research and Development
9 Agreements;

10 (2) non-Federal Work for Others Agreements;
11 and

12 (3) Agreements for Commercializing Tech-
13 nology under the pilot program described in section
14 127.

15 (c) FINANCIAL AWARDS.—The Secretary shall make
16 public all grants, agreements, and other financial support
17 for all research, development, demonstration, and commer-
18 cial application activities within 30 days of an agreement.

19 The information shall include—

20 (1) the name of the project recipient, including
21 all project partners;

22 (2) the amount of the award;

23 (3) a project description; and

24 (4) the expected timeframe of completion.

1 (d) EXEMPTION.—This section shall not require the
2 disclosure of information protected from disclosure under
3 section 552(b) of title 5, United States Code.

4 **SEC. 122. NATIONAL ENERGY TECHNOLOGY LABORATORY.**

5 (a) FINDING.—Congress finds that the Department
6 of Energy owns 17 National Laboratories, 16 of which are
7 contractor-operated. The National Energy Technology
8 Laboratory is the exclusive Government-operated labora-
9 tory.

10 (b) ASSESSMENT.—Not later than 60 days after the
11 date of enactment of this Act, the Under Secretary shall
12 enter into an arrangement with the National Academy of
13 Public Administration to conduct an assessment of the
14 management and operations of the National Energy Tech-
15 nology Laboratory.

16 (c) ELEMENTS OF ASSESSMENT.—The assessment
17 performed under subsection (b) shall—

18 (1) compare laboratory management as a gov-
19 ernment-owned, government-operated model com-
20 pared to a government-owned, contractor-operated
21 model;

22 (2) provide a cost-benefit analysis to support
23 the comparison under paragraph (1); and

1 (3) identify a strategy for transitioning the lab-
2 oratory to a government-owned, contractor-operated
3 model.

4 (d) SECRETARY'S RESPONSE.—Not later than 90
5 days after the completion of the assessment performed
6 under subsection (b), the Secretary shall deliver to the
7 Committee on Science, Space, and Technology of the
8 House of Representatives and the Committee on Energy
9 and Natural Resources of the Senate a response to the
10 findings and recommendations of the National Academy
11 of Public Administration.

12 **SEC. 123. SAVINGS CLAUSE.**

13 Nothing in this subtitle or an amendment made by
14 this subtitle abrogates or otherwise affects the primary re-
15 sponsibilities of any National Laboratory to the Depart-
16 ment.

17 **SEC. 124. UNDER SECRETARY FOR SCIENCE AND ENERGY.**

18 (a) IN GENERAL.—Section 202(b) of the Department
19 of Energy Organization Act (42 U.S.C. 7132(b)) is
20 amended—

21 (1) by striking “Under Secretary for Science”
22 each place it appears and inserting “Under Sec-
23 retary for Science and Energy”; and

24 (2) in paragraph (4)—

1 (A) in subparagraph (F), by striking
2 “and” at the end;

3 (B) in subparagraph (G), by striking the
4 period at the end and inserting a semicolon;
5 and

6 (C) by inserting after subparagraph (G)
7 the following:

8 “(H) establish appropriate linkages be-
9 tween offices under the jurisdiction of the
10 Under Secretary; and

11 “(I) perform such functions and duties as
12 the Secretary shall prescribe, consistent with
13 this section.”.

14 (b) CONFORMING AMENDMENTS.—

15 (1) Section 3164(b)(1) of the Department of
16 Energy Science Education Enhancement Act (42
17 U.S.C. 7381a(b)(1)) is amended by striking “Under
18 Secretary for Science” and inserting “Under Sec-
19 retary for Science and Energy”.

20 (2) Section 641(h)(2) of the United States En-
21 ergy Storage Competitiveness Act of 2007 (42
22 U.S.C. 17231(h)(2)) is amended by striking “Under
23 Secretary for Science” and inserting “Under Sec-
24 retary for Science and Energy”.

1 **SEC. 125. NATIONAL LABORATORIES OPERATIONS AND**
2 **PERFORMANCE MANAGEMENT.**

3 (a) IN GENERAL.—The Secretary shall ensure that
4 the following duties and responsibilities are carried out
5 through one or more appropriate statutory or administra-
6 tive entities:

7 (1) Evaluation, coordination, and promotion of
8 transfer of National Laboratory research and devel-
9 opment results to the market in collaboration with
10 the Technology Transfer Coordinator.

11 (2) Submission to the Secretary of reports de-
12 scribing recommendations for best practices for the
13 National Laboratories including, with respect to
14 management and operations procedures, conflict of
15 interest regulations, engagement with the private
16 sector, and technology transfer methodologies.

17 (3) Implementation of other duties, as the Sec-
18 retary determines appropriate, to improve the oper-
19 ations and performance of the National Labora-
20 tories.

21 (b) REPORTING.—The Secretary, in consultation with
22 the appropriate committees of Congress, shall provide an
23 annual update on progress made in carrying out sub-
24 section (a), including the improvement of National Lab-
25 oratory operations and performance and strategic depart-
26 mental and National Laboratory coordination.

1 **SEC. 126. SENSE OF CONGRESS ON AN INTEGRATED STRAT-**
2 **EGY FOR NATIONAL LABORATORIES IN THE**
3 **21ST CENTURY.**

4 It is the sense of Congress that—

5 (1) the establishment of the independent Com-
6 mission to Review the Effectiveness of the National
7 Energy Laboratories under section 319 of title III of
8 division D of the Consolidated Appropriations Act,
9 2014, is an important step towards developing a co-
10 ordinated strategy for the National Laboratories in
11 the 21st century; and

12 (2) Congress looks forward to—

13 (A) receiving the findings and conclusions
14 of the Commission; and

15 (B) engaging with the Administration—

16 (i) in strengthening the mission of the
17 National Laboratories; and

18 (ii) to reform and modernize the oper-
19 ations and management of the National
20 Laboratories.

21 **SEC. 127. AGREEMENTS FOR COMMERCIALIZING TECH-**
22 **NOLOGY PILOT PROGRAM.**

23 (a) IN GENERAL.—The Secretary shall carry out the
24 Agreements for Commercializing Technology pilot pro-
25 gram of the Department, as announced by the Secretary
26 on December 8, 2011, in accordance with this section.

1 (b) TERMS.—Each agreement entered into pursuant
2 to the pilot program referred to in subsection (a) shall
3 provide to the contractor of the applicable National Lab-
4 oratory, to the maximum extent determined to be appro-
5 priate by the Secretary, increased authority to negotiate
6 contract terms, such as intellectual property rights, in-
7 demnification, payment structures, performance guaran-
8 tees, and multiparty collaborations.

9 (c) ELIGIBILITY.—

10 (1) IN GENERAL.—Notwithstanding any other
11 provision of law (including regulations), any Na-
12 tional Laboratory may enter into an agreement pur-
13 suant to the pilot program referred to in subsection
14 (a).

15 (2) AGREEMENTS WITH NON-FEDERAL ENTI-
16 TIES.—To carry out paragraph (1) and subject to
17 paragraph (3), the Secretary shall permit the direc-
18 tors of the National Laboratories to execute agree-
19 ments with non-Federal entities, including non-Fed-
20 eral entities already receiving Federal funding that
21 will be used to support activities under agreements
22 executed pursuant to paragraph (1).

23 (3) RESTRICTION.—The requirements of chap-
24 ter 18 of title 35, United States Code (commonly
25 known as the “Bayh-Dole Act”) shall apply if—

1 (A) the agreement is a funding agreement
2 (as that term is defined in section 201 of that
3 title); and

4 (B) at least 1 of the parties to the funding
5 agreement is eligible to receive rights under
6 that chapter.

7 (d) SUBMISSION TO SECRETARY.—Each affected di-
8 rector of a National Laboratory shall submit to the Sec-
9 retary, with respect to each agreement entered into under
10 this section—

11 (1) a summary of information relating to the
12 relevant project;

13 (2) the total estimated costs of the project;

14 (3) estimated commencement and completion
15 dates of the project; and

16 (4) other documentation determined to be ap-
17 propriate by the Secretary.

18 (e) CERTIFICATION.—The Secretary shall require the
19 contractor of the affected National Laboratory to certify
20 that each activity carried out under a project for which
21 an agreement is entered into under this section—

22 (1) is not in direct competition with the private
23 sector; and

24 (2) does not present, or minimizes, any appar-
25 ent conflict of interest, and avoids or neutralizes any

1 actual conflict of interest, as a result of the agree-
2 ment under this section.

3 (f) EXTENSION.—The pilot program referred to in
4 subsection (a) shall be extended for a term of 2 years after
5 the date of enactment of this Act.

6 (g) REPORT.—Not later than 60 days after the date
7 described in subsection (f), the Secretary, in coordination
8 with directors of the National Laboratories, shall submit
9 to the Committee on Science, Space, and Technology of
10 the House of Representatives and the Committee on En-
11 ergy and Natural Resources of the Senate a report that—

12 (1) assesses the overall effectiveness of the pilot
13 program referred to in subsection (a);

14 (2) identifies opportunities to improve the effec-
15 tiveness of the pilot program;

16 (3) assesses the potential for program activities
17 to interfere with the responsibilities of the National
18 Laboratories to the Department; and

19 (4) provides a recommendation regarding the
20 future of the pilot program.

21 **SEC. 128. TECHNOLOGY TRANSFER.**

22 (a) IN GENERAL.—Subject to subsections (b) and (c),
23 the Secretary shall delegate to directors of the National
24 Laboratories signature authority with respect to any
25 agreement described in subsection (b) the total cost of

1 which (including the National Laboratory contributions
2 and project recipient cost share) is less than \$500,000.

3 (b) AGREEMENTS.—Subsection (a) applies to—

4 (1) a cooperative research and development
5 agreement;

6 (2) a non-Federal work-for-others agreement;

7 and

8 (3) Agreements for Commercializing Tech-
9 nology entered into under the pilot program de-
10 scribed in section 127.

11 (c) ADMINISTRATION.—

12 (1) ACCOUNTABILITY.—The director of the af-
13 fected National Laboratory and the affected con-
14 tractor shall carry out an agreement under this sec-
15 tion in accordance with applicable policies of the De-
16 partment, including by ensuring that the agreement
17 does not compromise any national security, eco-
18 nomic, or environmental interest of the United
19 States.

20 (2) CERTIFICATION.—The director of the af-
21 fected National Laboratory and the affected con-
22 tractor shall certify that each activity carried out
23 under a project for which an agreement is entered
24 into under this section does not present, or mini-
25 mizes, any apparent conflict of interest, and avoids

1 or neutralizes any actual conflict of interest, as a re-
2 sult of the agreement under this section.

3 (3) AVAILABILITY OF RECORDS.—On entering
4 an agreement under this section, the director of a
5 National Laboratory shall submit to the Secretary
6 for monitoring and review all records of the National
7 Laboratory relating to the agreement.

8 (4) RATES.—The director of a National Lab-
9 oratory may charge higher rates for services per-
10 formed under a partnership agreement entered into
11 pursuant to this section, regardless of the full cost
12 of recovery.

13 (d) CONFORMING AMENDMENT.—Section 12 of the
14 Stevenson-Wydler Technology Innovation Act of 1980 (15
15 U.S.C. 3710a) is amended—

16 (1) in subsection (a)—

17 (A) by redesignating paragraphs (1) and
18 (2) as subparagraphs (A) and (B), respectively,
19 and indenting the subparagraphs appropriately;

20 (B) by striking “Each Federal agency”
21 and inserting the following:

22 “(1) IN GENERAL.—Except as provided in para-
23 graph (2), each Federal agency”; and

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

1 “(2) EXCEPTION.—Notwithstanding paragraph
2 (1), in accordance with section 128(a) of the Ena-
3 bling Innovation for Science, Technology, and En-
4 ergy in America Act of 2014, approval by the Sec-
5 retary of Energy shall not be required for any tech-
6 nology transfer agreement proposed to be entered
7 into by a National Laboratory of the Department of
8 Energy, the total cost of which (including the Na-
9 tional Laboratory contributions and project recipient
10 cost share) is less than \$500,000.”; and

11 (2) in subsection (b), by striking “subsection
12 (a)(1)” each place it appears and inserting “sub-
13 section (a)(1)(A)”.

14 **SEC. 129. INCLUSION OF EARLY-STAGE TECHNOLOGY DEM-**
15 **ONSTRATION IN AUTHORIZED TECHNOLOGY**
16 **TRANSFER ACTIVITIES.**

17 Section 1001 of the Energy Policy Act of 2005 (42
18 U.S.C. 16391) is amended by—

19 (1) redesignating subsection (g) as subsection
20 (h); and

21 (2) inserting after subsection (f) the following:

22 “(g) EARLY-STAGE TECHNOLOGY DEMONSTRATION.—The Secretary shall permit the directors of the Na-
23 tional Laboratories to use funds allocated for technology
24 transfer within the Department to carry out early-stage
25 transfer within the Department to carry out early-stage

1 and pre-commercial technology demonstration activities to
2 remove technology barriers that limit private sector inter-
3 est and demonstrate potential commercial applications of
4 any research and technologies arising from National Lab-
5 oratory activities intended to meet the Federal Govern-
6 ment’s research needs.”.

7 **SEC. 130. FUNDING COMPETITIVENESS FOR INSTITUTIONS**
8 **OF HIGHER EDUCATION AND OTHER NON-**
9 **PROFIT INSTITUTIONS.**

10 Section 988(b) of the Energy Policy Act of 2005 (42
11 U.S.C. 16352(b)) is amended—

12 (1) in paragraph (1), by striking “Except as
13 provided in paragraphs (2) and (3)” and inserting
14 “Except as provided in paragraphs (2), (3), and
15 (4)”; and

16 (2) by adding at the end the following:

17 “(4) EXEMPTION FOR INSTITUTIONS OF HIGH-
18 ER EDUCATION AND OTHER NONPROFIT INSTITU-
19 TIONS.—

20 “(A) IN GENERAL.—Paragraph (1) shall
21 not apply to a research or development activity
22 performed by an institution of higher education
23 or nonprofit institution (as defined in section 4
24 of the Stevenson-Wydler Technology Innovation
25 Act of 1980 (15 U.S.C. 3703)).

1 “(B) TERMINATION DATE.—The exemp-
2 tion under subparagraph (A) shall apply during
3 the 6-year period beginning on the date of en-
4 actment of this paragraph.”.

5 **SEC. 131. REPORT BY GOVERNMENT ACCOUNTABILITY OF-**
6 **FICE.**

7 Not later than 3 years after the date of enactment
8 of this Act, the Comptroller General of the United States
9 shall submit to Congress a report describing the results
10 of the projects developed under sections 127, 128, and
11 129, and the amendments made thereby, including infor-
12 mation regarding—

13 (1) partnerships initiated as a result of those
14 projects and the potential linkages presented by
15 those partnerships with respect to national priorities
16 and other taxpayer-funded research; and

17 (2) whether the activities carried out under
18 those projects result in—

19 (A) fiscal savings;

20 (B) expansion of National Laboratory ca-
21 pabilities;

22 (C) increased efficiency of technology
23 transfers; or

24 (D) an increase in general efficiency of the
25 National Laboratory system.

1 **SEC. 132. DEFINITIONS.**

2 In this title:

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

5 (2) DIRECTOR.—The term “Director” means
6 the Director of the Office of Science.

7 (3) NATIONAL LABORATORIES.—The term “Na-
8 tional Laboratories” means Department of Energy
9 nonmilitary national laboratories, including—

10 (A) Ames Laboratory;

11 (B) Argonne National Laboratory;

12 (C) Brookhaven National Laboratory;

13 (D) Fermi National Accelerator Labora-
14 tory;

15 (E) Idaho National Laboratory;

16 (F) Lawrence Berkeley National Labora-
17 tory;

18 (G) National Energy Technology Labora-
19 tory;

20 (H) National Renewable Energy Labora-
21 tory;

22 (I) Oak Ridge National Laboratory;

23 (J) Pacific Northwest National Labora-
24 tory;

25 (K) Princeton Plasma Physics Laboratory;

26 (L) Savannah River National Laboratory;

1 (M) Stanford Linear Accelerator Center;

2 (N) Thomas Jefferson National Accel-
3 erator Facility; and

4 (O) any laboratories operated by the Na-
5 tional Nuclear Security Administration, but
6 only with respect to the civilian energy activities
7 thereof.

8 (4) OFFICE OF SCIENCE.—The term “Office of
9 Science” means the Department of Energy Office of
10 Science.

11 (5) SECRETARY.—The term “Secretary” means
12 the Secretary of Energy.

13 (6) STEM.—The term “STEM” means,
14 science, technology, engineering, and mathematics.

15 (7) UNDER SECRETARY.—The term “Under
16 Secretary” means the Under Secretary for Science
17 and Energy.

18 **TITLE II—ONE FUTURE**

19 **SEC. 201. SHORT TITLE.**

20 This title may be cited as the “Our Nation’s Energy
21 Future Act of 2014” or the “ONE Future Act”.

22 **Subtitle A—Crosscutting Research** 23 **and Development**

24 **SEC. 211. CROSSCUTTING RESEARCH AND DEVELOPMENT.**

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

1 (1) The President believes that the United
2 States energy policy must have “an all-of-the-above
3 strategy for the 21st century that develops every
4 source of American-made energy”.

5 (2) The Department plays a strategic role in
6 critical energy research and development to ensure a
7 balanced, prosperous, and secure energy future.

8 (b) ADDRESSING OUR NATION’S ENERGY FUTURE
9 ISSUES.—The Secretary shall, through the Under Sec-
10 retary for Science and Energy, utilize the capabilities of
11 the Department to address issues facing our Nation’s en-
12 ergy future, including identifying strategic opportunities
13 for collaborative research, development, demonstration,
14 and commercial application of innovative science and tech-
15 nologies for—

16 (1) advancing the state of the energy-water-
17 land use nexus;

18 (2) improving energy transmission and distribu-
19 tion systems security and resiliency;

20 (3) utilizing supercritical carbon dioxide in elec-
21 tric power generation;

22 (4) subsurface engineering;

23 (5) exascale computing; and

24 (6) critical challenges identified through com-
25 prehensive energy studies, evaluations, and reviews.

1 (c) CROSSCUTTING APPROACHES.—To the maximum
2 extent practicable, the Secretary shall seek to leverage ex-
3 isting programs, and consolidate and coordinate activities,
4 throughout the Department to promote collaboration and
5 crosscutting approaches within programs.

6 (d) ADDITIONAL ACTIONS.—The Secretary shall—

7 (1) prioritize activities that promote the utiliza-
8 tion of all affordable domestic resources;

9 (2) identify opportunities for public-private
10 partnerships, innovative financing mechanisms, and
11 grant challenges;

12 (3) develop a rigorous and realistic planning,
13 evaluation, and technical assessment framework for
14 setting objective, long-term strategic goals and eval-
15 uating progress that ensures the integrity and inde-
16 pendence to insulate planning from political influ-
17 ence and the agility and flexibility to adapt to mar-
18 ket dynamics;

19 (4) ensure that activities shall be undertaken in
20 a manner that does not duplicate other activities
21 within the Department or other Federal Government
22 activities; and

23 (5) identify programs that may be more effec-
24 tively left to the States, industry, nongovernmental

1 organizations, institutions of higher education, or
2 other stakeholders.

3 **SEC. 212. STRATEGIC RESEARCH PORTFOLIO ANALYSIS**
4 **AND COORDINATION PLAN.**

5 Section 994 of Energy Policy Act of 2005 (42 U.S.C.
6 16358) is amended to read as follows:

7 **“SEC. 994. STRATEGIC RESEARCH PORTFOLIO ANALYSIS**
8 **AND COORDINATION PLAN.**

9 “(a) IN GENERAL.—The Secretary shall periodically
10 review all of the science and technology activities of the
11 Department in a strategic framework that takes into ac-
12 count the frontiers of science to which the Department
13 can contribute, the national needs relevant to the Depart-
14 ment’s statutory missions, and global energy dynamics.

15 “(b) COORDINATION ANALYSIS AND PLAN.—As part
16 of the review under subsection (a), the Secretary shall de-
17 velop a coordination plan to improve coordination and col-
18 laboration in research, development, demonstration, and
19 commercial application activities across Department orga-
20 nizational boundaries.

21 “(c) PLAN CONTENTS.—The plan shall describe—

22 “(1) cross-cutting scientific and technical issues
23 and research questions that span more than one pro-
24 gram or major office of the Department;

1 “(2) how the applied technology programs of
2 the Department are coordinating their activities, and
3 addressing those questions;

4 “(3) ways in which the technical interchange
5 within the Department, particularly between the Of-
6 fice of Science and the applied technology programs,
7 can be enhanced, including ways in which the re-
8 search agendas of the Office of Science and the ap-
9 plied programs can interact and assist each other;

10 “(4) a description of how the Secretary will en-
11 sure that the Department’s overall research agenda
12 include, in addition to fundamental, curiosity-driven
13 research, fundamental research related to topics of
14 concern to the applied programs, and applications in
15 Departmental technology programs of research re-
16 sults generated by fundamental, curiosity-driven re-
17 search;

18 “(5) critical assessments of any ongoing pro-
19 grams that have experienced sub-par performance or
20 cost over-runs of 10 percent or more over one or
21 more years; and

22 “(6) activities that may be more effectively left
23 to the States, industry, nongovernmental organiza-
24 tions, institutions of higher education, or other
25 stakeholders.

1 “(d) PLAN TRANSMITTAL.—Not later than 1 year
2 after the date of enactment of the ONE Future Act, and
3 every 4 years thereafter, the Secretary shall transmit to
4 the Committee on Science, Space, and Technology of the
5 House of Representatives and the Committee on Energy
6 and Natural Resources of the Senate the results of the
7 review under subsection (a) and the coordination plan
8 under subsection (b).”.

9 **SEC. 213. STRATEGY FOR FACILITIES AND INFRASTRUC-**
10 **TURE.**

11 (a) AMENDMENTS.—Section 993 of the Energy Pol-
12 icy Act of 2005 (42 U.S.C. 16357) is amended—

13 (1) by amending the section heading to read as
14 follows: “**STRATEGY FOR FACILITIES AND IN-**
15 **FRASTRUCTURE**”; and

16 (2) in subsection (b)(1), by striking “2008” in-
17 serting “2018”.

18 (b) TABLE OF CONTENTS AMENDMENT.—The item
19 relating to section 993 in the table of contents of the En-
20 ergy Policy Act of 2005 is amended to read as follows:

“Sec. 993. Strategy for facilities and infrastructure.”.

21 **SEC. 214. DISTRIBUTED ENERGY AND ELECTRIC ENERGY**
22 **SYSTEMS.**

23 Section 921 of the Energy Policy Act of 2005 (42
24 U.S.C. 16211) is amended to read as follows:

1 **“SEC. 921. DISTRIBUTED ENERGY AND ELECTRIC ENERGY**
2 **SYSTEMS.**

3 “(a) IN GENERAL.—The Secretary shall carry out
4 programs of research, development, demonstration, and
5 commercial application on distributed energy resources
6 and systems reliability and efficiency, to improve the reli-
7 ability and efficiency of distributed energy resources and
8 systems, integrating advanced energy technologies with
9 grid connectivity, including activities described in this sub-
10 title. The programs shall address advanced energy tech-
11 nologies and systems and advanced grid security, resil-
12 iency, and reliability technologies.

13 “(b) OBJECTIVES.—To the maximum extent prac-
14 ticable, the Secretary shall seek to—

15 “(1) leverage existing programs;

16 “(2) consolidate and coordinate activities
17 throughout the Department to promote collaboration
18 and crosscutting approaches;

19 “(3) ensure activities are undertaken in a man-
20 ner that does not duplicate other activities within
21 the Department or other Federal Government activi-
22 ties; and

23 “(4) identify programs that may be more effec-
24 tively left to the States, industry, nongovernmental
25 organizations, institutions of higher education, or
26 other stakeholders.”.

1 **SEC. 215. DISTRIBUTED ENERGY TECHNOLOGY COORDI-**
2 **NATING CONSORTIA.**

3 (a) AMENDMENTS.—Section 924 of the Energy Pol-
4 icy Act of 2005 (42 U.S.C. 16214) is amended—

5 (1) by amending the section heading to read as
6 follows: “**DISTRIBUTED ENERGY TECHNOLOGY**
7 **COORDINATING CONSORTIA**”;

8 (2) by striking paragraph (2) of subsection (b);
9 and

10 (3) by redesignating paragraph (3) of sub-
11 section (b) as paragraph (2).

12 (b) TABLE OF CONTENTS AMENDMENT.—The item
13 relating to section 924 in the table of contents of the En-
14 ergy Policy Act of 2005 is amended to read as follows:
“Sec. 924. Distributed energy technology coordinating consortia.”.

15 **SEC. 216. ELECTRIC TRANSMISSION AND DISTRIBUTION RE-**
16 **SEARCH AND DEVELOPMENT.**

17 (a) AMENDMENTS.—Section 925 of the Energy Pol-
18 icy Act of 2005 (42 U.S.C. 16215) is amended—

19 (1) by amending the section heading to read as
20 follows: “**ELECTRIC TRANSMISSION AND DIS-**
21 **TRIBUTION RESEARCH AND DEVELOPMENT**”;

22 (2) in subsection (a), by inserting “innovations
23 for” after “which shall include”;

24 (3) in subsection (b)(1), by striking “this Act”
25 and inserting “the ONE Future Act”; and

1 (4) by amending subsection (c) to read as fol-
2 lows:

3 “(c) IMPLEMENTATION.—

4 “(1) CONSORTIUM.—The Secretary shall con-
5 sider implementing the program under this section
6 using a consortium of participants from industry, in-
7 stitutions of higher education, and National Labora-
8 tories.

9 “(2) OBJECTIVES.—To the maximum extent
10 practicable the Secretary shall seek to—

11 “(A) leverage existing programs;

12 “(B) consolidate and coordinate activities,
13 throughout the Department to promote collabo-
14 ration and crosscutting approaches;

15 “(C) ensure activities are undertaken in a
16 manner that does not duplicate other activities
17 within the Department or other Federal Gov-
18 ernment activities; and

19 “(D) identify programs that may be more
20 effectively left to the States, industry, non-
21 governmental organizations, institutions of
22 higher education, or other stakeholders.”.

23 (b) TABLE OF CONTENTS AMENDMENT.—The item
24 relating to section 925 in the table of contents of the En-
25 ergy Policy Act of 2005 is amended to read as follows:

“Sec. 925. Electric transmission and distribution research and development.”.

1 **Subtitle B—Nuclear Energy**
2 **Research and Development**

3 **SEC. 221. OBJECTIVES.**

4 Section 951 of the Energy Policy Act of 2005 (42
5 U.S.C. 16271) is amended—

6 (1) by amending subsection (a) to read as fol-
7 lows:

8 “(a) IN GENERAL.—The Secretary shall conduct pro-
9 grams of civilian nuclear energy research, development,
10 demonstration, and commercial application, including ac-
11 tivities described in this subtitle. Such programs shall take
12 into consideration the following objectives:

13 “(1) Enhancing nuclear power’s viability as
14 part of the United States energy portfolio.

15 “(2) Reducing used nuclear fuel and nuclear
16 waste products generated by civilian nuclear energy.

17 “(3) Supporting technological advances in areas
18 that industry by itself is not likely to undertake be-
19 cause of technical and financial uncertainty.

20 “(4) Providing the technical means to reduce
21 the likelihood of nuclear proliferation.

22 “(5) Maintaining a cadre of nuclear scientists
23 and engineers.

1 “(6) Maintaining National Laboratory and uni-
2 versity nuclear programs, including their infrastruc-
3 ture.

4 “(7) Supporting both individual researchers and
5 multidisciplinary teams of researchers to pioneer
6 new approaches in nuclear energy, science, and tech-
7 nology.

8 “(8) Developing, planning, constructing, acquir-
9 ing, and operating special equipment and facilities
10 for the use of researchers.

11 “(9) Supporting technology transfer and other
12 appropriate activities to assist the nuclear energy in-
13 dustry, and other users of nuclear science and engi-
14 neering, including activities addressing reliability,
15 availability, productivity, component aging, safety,
16 and security of nuclear power plants.

17 “(10) Reducing the environmental impact of
18 nuclear energy-related activities.

19 “(11) Researching and developing technologies
20 and processes to meet Federal and State require-
21 ments and standards for nuclear power systems.”;

22 (2) by striking subsections (b) through (d); and

23 (3) by redesignating subsection (e) as sub-
24 section (b).

1 **SEC. 222. PROGRAM OBJECTIVES STUDY.**

2 Section 951 of the Energy Policy Act of 2005 (42
3 U.S.C. 16271) is further amended by adding at the end
4 the following new subsection:

5 “(c) PROGRAM OBJECTIVES STUDY.—In furtherance
6 of the program objectives listed in subsection (a) of this
7 section, the Government Accountability Office shall, within
8 one year after the date of enactment of this subsection,
9 transmit to the Congress a report on the results of a study
10 on the scientific and technical merit of major Federal and
11 State requirements and standards, including moratoria,
12 that delay or impede the further development and com-
13 mercialization of nuclear power, and how the Department
14 can assist in overcoming such delays or impediments.”.

15 **SEC. 223. NUCLEAR ENERGY RESEARCH AND DEVELOP-**
16 **MENT PROGRAMS.**

17 Section 952 of the Energy Policy Act of 2005 (42
18 U.S.C. 16272) is amended by striking subsections (c)
19 through (e) and inserting the following:

20 “(c) REACTOR CONCEPTS.—

21 “(1) IN GENERAL.—The Secretary shall carry
22 out a program of research, development, demonstra-
23 tion, and commercial application to advance nuclear
24 power systems as well as technologies to sustain cur-
25 rently deployed systems.

1 “(2) DESIGNS AND TECHNOLOGIES.—In con-
2 ducting the program under this subsection, the Sec-
3 retary shall examine advanced reactor designs and
4 nuclear technologies, including those that—

5 “(A) are economically competitive with
6 other electric power generation plants;

7 “(B) have higher efficiency, lower cost, and
8 improved safety compared to reactors in oper-
9 ation as of the date of enactment of the ONE
10 Future Act;

11 “(C) utilize passive safety features;

12 “(D) minimize proliferation risks;

13 “(E) substantially reduce production of
14 high-level waste per unit of output;

15 “(F) increase the life and sustainability of
16 reactor systems currently deployed;

17 “(G) use improved instrumentation;

18 “(H) are capable of producing large-scale
19 quantities of hydrogen or process heat;

20 “(I) minimize water usage or use alter-
21 natives to water as a cooling mechanism; or

22 “(J) use nuclear energy as part of an inte-
23 grated energy system.

24 “(3) INTERNATIONAL COOPERATION.—In car-
25 rying out the program under this subsection, the

1 Secretary shall seek opportunities to enhance the
2 progress of the program through international co-
3 operation through such organizations as the Genera-
4 tion IV International Forum or any other inter-
5 national collaboration the Secretary considers appro-
6 priate.

7 “(4) EXCEPTIONS.—No funds authorized to be
8 appropriated to carry out the activities described in
9 this subsection shall be used to fund the activities
10 authorized under sections 641 through 645.”.

11 **SEC. 224. SMALL MODULAR REACTOR PROGRAM.**

12 Section 952 of the Energy Policy Act of 2005 (42
13 U.S.C. 16272) is further amended by adding at the end
14 the following new subsection:

15 “(d) SMALL MODULAR REACTOR PROGRAM.—

16 “(1) IN GENERAL.—The Secretary shall carry
17 out a small modular reactor program to promote re-
18 search, development, demonstration, and commercial
19 application of small modular reactors, including
20 through cost-shared projects for commercial applica-
21 tion of reactor systems designs.

22 “(2) CONSULTATION.—The Secretary shall con-
23 sult with and utilize the expertise of the Secretary
24 of the Navy in establishing and carrying out such
25 program.

1 “(3) ADDITIONAL ACTIVITIES.—Activities may
2 also include development of advanced computer mod-
3 eling and simulation tools, by Federal and non-Fed-
4 eral entities, which demonstrate and validate new de-
5 sign capabilities of innovative small modular reactor
6 designs.

7 “(4) DEFINITION.—For the purposes of this
8 subsection, the term ‘small modular reactor’ means
9 a nuclear reactor meeting generally accepted indus-
10 try standards—

11 “(A) with a rated capacity of less than 300
12 electrical megawatts;

13 “(B) with respect to which most parts can
14 be factory assembled and shipped as modules to
15 a reactor plant site for assembly; and

16 “(C) that can be constructed and operated
17 in combination with similar reactors at a single
18 site.”.

19 **SEC. 225. CONVENTIONAL IMPROVEMENTS TO NUCLEAR**
20 **POWER PLANTS.**

21 Section 952 of the Energy Policy Act of 2005 (42
22 U.S.C. 16272) is further amended by adding at the end
23 the following new subsection:

24 “(e) CONVENTIONAL IMPROVEMENTS TO NUCLEAR
25 POWER PLANTS.—

1 “(1) IN GENERAL.—The Secretary may carry
2 out a Nuclear Energy Research Initiative for re-
3 search and development related to power conversion
4 improvements to nuclear power plants to promote
5 the research, development, demonstration, and com-
6 mercial application of—

7 “(A) cooling systems;

8 “(B) turbine technologies;

9 “(C) heat exchangers and pump design;

10 “(D) special coatings to improve lifetime of
11 components and performance of heat exchang-
12 ers; and

13 “(E) advanced power conversion systems
14 for advanced reactor technologies.

15 “(2) ADMINISTRATION.—The Secretary may
16 undertake initiatives under this subsection only when
17 the goals are relevant and proper to enhance the
18 performance of technologies developed under sub-
19 section (c). Not more than \$10,000,000 of funds au-
20 thorized for this section may be used for carrying
21 out this subsection.”.

22 **SEC. 226. FUEL CYCLE RESEARCH AND DEVELOPMENT.**

23 (a) AMENDMENTS.—Section 953 of the Energy Pol-
24 icy Act of 2005 (42 U.S.C. 16273) is amended—

1 (1) in the section heading by striking “**AD-**
2 **VANCED FUEL CYCLE INITIATIVE**” and inserting
3 “**FUEL CYCLE RESEARCH AND DEVELOPMENT**”;

4 (2) by striking subsection (a);

5 (3) by redesignating subsections (b) through (d)
6 as subsections (d) through (f), respectively; and

7 (4) by inserting before subsection (d), as so re-
8 designated by paragraph (3) of this subsection, the
9 following new subsections:

10 “(a) **IN GENERAL.**—The Secretary shall conduct a
11 fuel cycle research, development, demonstration, and com-
12 mercial application program (referred to in this section as
13 the ‘program’) on fuel cycle options that improve uranium
14 resource utilization, maximize energy generation, minimize
15 nuclear waste creation, improve safety, mitigate risk of
16 proliferation, and improve waste management in support
17 of a national strategy for spent nuclear fuel and the reac-
18 tor concepts research, development, demonstration, and
19 commercial application program under section 952(c).

20 “(b) **FUEL CYCLE OPTIONS.**—Under this section the
21 Secretary may consider implementing the following initia-
22 tives:

23 “(1) **OPEN CYCLE.**—Developing fuels, including
24 the use of nonuranium materials and alternate
25 claddings, for use in reactors that increase energy

1 generation, improve safety performance and mar-
2 gins, and minimize the amount of nuclear waste pro-
3 duced in an open fuel cycle.

4 “(2) RECYCLE.—Developing advanced recycling
5 technologies, including advanced reactor concepts to
6 improve resource utilization, reduce proliferation
7 risks, and minimize radiotoxicity, decay heat, and
8 mass and volume of nuclear waste to the greatest
9 extent possible.

10 “(3) ADVANCED STORAGE METHODS.—Devel-
11 oping advanced storage technologies for both onsite
12 and long-term storage that substantially prolong the
13 effective life of current storage devices or that sub-
14 stantially improve upon existing nuclear waste stor-
15 age technologies and methods, including repositories.

16 “(4) ALTERNATIVE AND DEEP BOREHOLE
17 STORAGE METHODS.—Developing alternative storage
18 methods for long-term storage, including deep
19 boreholes into stable crystalline rock formations and
20 mined repositories in a range of geologic media.

21 “(5) FAST TEST REACTOR.—Investigating the
22 potential research benefits of a fast test reactor to
23 conduct experiments on fuels and materials related
24 to fuel forms and fuel cycles that will increase fuel

1 utilization, reduce proliferation risks, and reduce nu-
2 clear waste products.

3 “(6) OTHER TECHNOLOGIES.—Developing any
4 other technology or initiative that the Secretary de-
5 termines is likely to advance the objectives of the
6 program.

7 “(c) ADDITIONAL ADVANCED RECYCLING AND
8 CROSSCUTTING ACTIVITIES.—In addition to and in sup-
9 port of the specific initiatives described in paragraphs (1)
10 through (6) of subsection (b), the Secretary may support
11 the following activities:

12 “(1) Development and testing of integrated
13 process flow sheets for advanced nuclear fuel recy-
14 cling processes.

15 “(2) Research to characterize the byproducts
16 and waste streams resulting from fuel recycling
17 processes.

18 “(3) Research and development on reactor con-
19 cepts or transmutation technologies that improve re-
20 source utilization or reduce the radiotoxicity of waste
21 streams.

22 “(4) Research and development on waste treat-
23 ment processes and separations technologies, ad-
24 vanced waste forms, and quantification of prolifera-
25 tion risks.

1 “(5) Identification and evaluation of test and
2 experimental facilities necessary to successfully im-
3 plement the advanced fuel cycle initiative.

4 “(6) Advancement of fuel cycle-related modeling
5 and simulation capabilities.

6 “(7) Research to understand the behavior of
7 high-burnup fuels.”.

8 (b) CONFORMING AMENDMENT.—The item relating
9 to section 953 in the table of contents of the Energy Policy
10 Act of 2005 is amended to read as follows:

 “Sec. 953. Fuel cycle research and development.”.

11 **SEC. 227. NUCLEAR ENERGY ENABLING TECHNOLOGIES**
12 **PROGRAM.**

13 (a) AMENDMENT.—Subtitle E of title IX of the En-
14 ergy Policy Act of 2005 (42 U.S.C. 16271 et seq.) is
15 amended by adding at the end the following new section:

16 **“SEC. 958. NUCLEAR ENERGY ENABLING TECHNOLOGIES.**

17 “(a) IN GENERAL.—The Secretary shall conduct a
18 program to support the integration of activities under-
19 taken through the reactor concepts research, development,
20 demonstration, and commercial application program under
21 section 952(c) and the fuel cycle research and development
22 program under section 953, and support crosscutting nu-
23 clear energy concepts. Activities commenced under this
24 section shall be concentrated on broadly applicable re-
25 search and development focus areas.

1 “(b) ACTIVITIES.—Activities conducted under this
2 section may include research involving—

3 “(1) advanced reactor materials;

4 “(2) advanced radiation mitigation methods;

5 “(3) advanced proliferation and security risk
6 assessment methods;

7 “(4) advanced sensors and instrumentation;

8 “(5) advanced nuclear manufacturing methods;

9 “(6) high performance computation modeling,
10 including multiphysics, multidimensional modeling
11 and simulation for nuclear energy systems; and

12 “(7) any crosscutting technology or trans-
13 formative concept aimed at establishing substantial
14 and revolutionary enhancements in the performance
15 of future nuclear energy systems that the Secretary
16 considers relevant and appropriate to the purpose of
17 this section.

18 “(c) REPORT.—The Secretary shall submit, as part
19 of the annual budget submission of the Department, a re-
20 port on the activities of the program conducted under this
21 section, which shall include a brief evaluation of each ac-
22 tivity’s progress.”.

23 (b) CONFORMING AMENDMENT.—The table of con-
24 tents of the Energy Policy Act of 2005 is amended by

1 adding at the end of the items for subtitle E of title IX
2 the following new item:

“Sec. 958. Nuclear energy enabling technologies.”.

3 **SEC. 228. TECHNICAL STANDARDS COLLABORATION.**

4 (a) IN GENERAL.—The Director of the National In-
5 stitute of Standards and Technology shall establish a nu-
6 clear energy standards committee (in this section referred
7 to as the “technical standards committee”) to facilitate
8 and support, consistent with the National Technology
9 Transfer and Advancement Act of 1995, the development
10 or revision of technical standards for new and existing nu-
11 clear power plants and advanced nuclear technologies.

12 (b) MEMBERSHIP.—

13 (1) IN GENERAL.—The technical standards
14 committee shall include representatives from appro-
15 priate Federal agencies and the private sector, and
16 be open to materially affected organizations involved
17 in the development or application of nuclear energy-
18 related standards.

19 (2) CO-CHAIRS.—The technical standards com-
20 mittee shall be co-chaired by a representative from
21 the National Institute of Standards and Technology
22 and a representative from a private sector standards
23 organization.

24 (c) DUTIES.—The technical standards committee
25 shall, in cooperation with appropriate Federal agencies—

1 (1) perform a needs assessment to identify and
2 evaluate the technical standards that are needed to
3 support nuclear energy, including those needed to
4 support new and existing nuclear power plants and
5 advanced nuclear technologies;

6 (2) formulate, coordinate, and recommend pri-
7 orities for the development of new technical stand-
8 ards and the revision of existing technical standards
9 to address the needs identified under paragraph (1);

10 (3) facilitate and support collaboration and co-
11 operation among standards developers to address the
12 needs and priorities identified under paragraphs (1)
13 and (2);

14 (4) as appropriate, coordinate with other na-
15 tional, regional, or international efforts on nuclear
16 energy-related technical standards in order to avoid
17 conflict and duplication and to ensure global com-
18 patibility; and

19 (5) promote the establishment and maintenance
20 of a database of nuclear energy-related technical
21 standards.

22 (d) AUTHORIZATION OF APPROPRIATIONS.—There
23 are authorized to be appropriated \$1,000,000 for fiscal
24 year 2015 to the Director of the National Institute of

1 Standards and Technology for activities under this sec-
2 tion.

3 **SEC. 229. EVALUATION OF LONG-TERM OPERATING NEEDS.**

4 (a) IN GENERAL.—The Secretary shall enter into an
5 arrangement with the National Academies to conduct an
6 evaluation of the scientific and technological challenges to
7 the long-term maintenance and safe operation of currently
8 deployed nuclear power reactors up to and beyond the
9 specified design-life of reactor systems.

10 (b) REPORT.—Not later than 1 year after the date
11 of enactment of this Act, the Secretary shall transmit to
12 the Congress, and make publically available, the results
13 of the evaluation undertaken by the Academies pursuant
14 to subsection (a).

15 **SEC. 230. AVAILABLE FACILITIES DATABASE.**

16 The Secretary shall prepare a database of non-Fed-
17 eral user facilities receiving Federal funds that may be
18 used for unclassified nuclear energy research. The Sec-
19 retary shall make this database accessible on the Depart-
20 ment's website.

21 **SEC. 231. NUCLEAR WASTE DISPOSAL.**

22 To the extent consistent with the requirements of
23 current law, the Department shall be responsible for dis-
24 posal of high-level radioactive waste or spent nuclear fuel

1 generated by reactors under the programs authorized in
2 this subtitle, or the amendments made by this subtitle.

3 **Subtitle C—Energy Efficiency and**
4 **Renewable Energy Research**
5 **and Development**

6 **SEC. 241. ENERGY EFFICIENCY.**

7 Section 911 of the Energy Policy Act of 2005 (42
8 U.S.C. 16191) is amended to read as follows:

9 **“SEC. 911. ENERGY EFFICIENCY.**

10 “(a) **OBJECTIVES.**—The Secretary shall conduct pro-
11 grams of energy efficiency research, development, dem-
12 onstration, and commercial application, including activi-
13 ties described in this subtitle. Such programs shall
14 prioritize activities that industry by itself is not likely to
15 undertake because of technical, financial, or regulatory
16 uncertainty, and take into consideration the following ob-
17 jectives:

18 “(1) Increasing energy efficiency.

19 “(2) Reducing the cost of energy and making
20 the economy more competitive.

21 “(3) Improving the energy security of the
22 United States.

23 “(4) Reducing the environmental impact of en-
24 ergy-related activities.

1 “(b) PROGRAMS.—Programs under this subtitle shall
2 include research, development, demonstration, and com-
3 mercial application of—

4 “(1) innovative, affordable technologies to im-
5 prove the energy efficiency and environmental per-
6 formance of vehicles, including weight and drag re-
7 duction technologies, and whole-vehicle design opti-
8 mization;

9 “(2) cost-effective technologies, for new con-
10 struction and retrofit, to improve the energy effi-
11 ciency and environmental performance of buildings,
12 using a whole-buildings approach;

13 “(3) advanced technologies to improve the en-
14 ergy efficiency, environmental performance, and
15 process efficiency of energy-intensive and waste-in-
16 tensive industries; and

17 “(4) technologies to improve the energy effi-
18 ciency of appliances and mechanical systems for
19 buildings in extreme climates, including cogenera-
20 tion, trigeneration, and polygeneration units and in-
21 creased use of renewable resources, or alternative
22 fuels.”.

23 **SEC. 242. NEXT GENERATION LIGHTING INITIATIVE.**

24 Section 912 of the Energy Policy Act of 2005 (42
25 U.S.C. 16192) is repealed.

1 **SEC. 243. BUILDING STANDARDS.**

2 Section 914 of the Energy Policy Act of 2005 (42
3 U.S.C. 16194) is amended by striking subsection (c).

4 **SEC. 244. SECONDARY ELECTRIC VEHICLE BATTERY USE**
5 **PROGRAM.**

6 Section 915 of the Energy Policy Act of 2005 (42
7 U.S.C. 16195) is repealed.

8 **SEC. 245. ENERGY EFFICIENCY SCIENCE INITIATIVE.**

9 Section 916(a) of the Energy Policy Act of 2005 (42
10 U.S.C. 16196(a)) is amended to read as follows:

11 “(a) ESTABLISHMENT.—The Secretary shall estab-
12 lish an Energy Efficiency Science Initiative to be managed
13 by the Under Secretary for Science and Energy, for grants
14 to be competitively awarded and subject to peer review for
15 research relating to energy efficiency innovations.”.

16 **SEC. 246. ADVANCED ENERGY TECHNOLOGY TRANSFER**
17 **CENTERS.**

18 Section 917 of the Energy Policy Act of 2005 (42
19 U.S.C. 16197) is amended—

20 (1) in subsection (a)—

21 (A) by inserting “and” at the end of para-
22 graph (2)(B);

23 (B) by striking “; and” at the end of para-
24 graph (3) and inserting a period; and

25 (C) by striking paragraph (4);

26 (2) in subsection (b)—

1 (A) by striking paragraph (1);

2 (B) by redesignating paragraphs (2)
3 through (5) as paragraphs (1) through (4), re-
4 spectively; and

5 (C) by striking paragraph (6);

6 (3) by amending subsection (g) to read as fol-
7 lows:

8 “(g) PROHIBITION.—None of the funds awarded
9 under this section may be used for the construction of fa-
10 cilities or the deployment of commercially available tech-
11 nologies.”; and

12 (4) by striking subsection (i).

13 **SEC. 247. RENEWABLE ENERGY.**

14 Section 931 of the Energy Policy Act of 2005 (42
15 U.S.C. 16231) is amended to read as follows:

16 **“SEC. 931. RENEWABLE ENERGY.**

17 “(a) IN GENERAL.—

18 “(1) OBJECTIVES.—The Secretary shall con-
19 duct programs of renewable energy research, devel-
20 opment, demonstration, and commercial application,
21 including activities described in this subtitle. Such
22 programs shall prioritize activities that industry by
23 itself is not likely to undertake because of technical,
24 financial, or regulatory uncertainty, and take into
25 consideration the following objectives:

1 “(A) Increasing the conversion efficiency of
2 all forms of renewable energy through improved
3 technologies.

4 “(B) Decreasing the cost of renewable en-
5 ergy generation and delivery.

6 “(C) Promoting the diversity of the energy
7 supply.

8 “(D) Decreasing the dependence of the
9 United States on foreign mineral resources.

10 “(E) Improving United States energy secu-
11 rity.

12 “(F) Decreasing the environmental impact
13 of renewable energy-related activities.

14 “(G) Increasing the export of renewable
15 generation technologies from the United States.

16 “(2) PROGRAMS.—

17 “(A) SOLAR ENERGY.—The Secretary shall
18 conduct a program of research, development,
19 demonstration, and commercial application for
20 solar energy, including innovations in—

21 “(i) photovoltaics;

22 “(ii) solar heating;

23 “(iii) concentrating solar power;

1 “(iv) lighting systems that integrate
2 sunlight and electrical lighting in com-
3 plement to each other;

4 “(v) manufacturability of low cost,
5 high quality solar systems; and

6 “(vi) development of technologies that
7 can be easily integrated into new and exist-
8 ing buildings.

9 “(B) WIND ENERGY.—The Secretary shall
10 conduct a program of research, development,
11 demonstration, and commercial application for
12 wind energy, including innovations in—

13 “(i) low speed wind energy;

14 “(ii) testing and verification tech-
15 nologies;

16 “(iii) distributed wind energy genera-
17 tion; and

18 “(iv) transformational technologies for
19 harnessing wind energy.

20 “(C) GEOTHERMAL.—The Secretary shall
21 conduct a program of research, development,
22 demonstration, and commercial application for
23 geothermal energy. The program shall focus on
24 developing innovative and transformational

1 technologies for reducing the costs of geo-
2 thermal energy, including technologies for—

3 “(i) improving detection of geothermal
4 resources;

5 “(ii) decreasing drilling costs;

6 “(iii) decreasing maintenance costs
7 through improved materials;

8 “(iv) increasing the potential for other
9 revenue sources, such as mineral produc-
10 tion; and

11 “(v) increasing the understanding of
12 reservoir life cycle and management.

13 “(D) HYDROPOWER.—The Secretary shall
14 conduct a program of research, development,
15 demonstration, and commercial application for
16 cost competitive technologies that enable the de-
17 velopment of new and incremental hydropower
18 capacity, adding to the diversity of the energy
19 supply of the United States, including:

20 “(i) Advanced technologies to enhance
21 environmental performance and yield
22 greater energy efficiencies.

23 “(ii) Ocean energy, including wave en-
24 ergy.

1 “(E) MISCELLANEOUS PROJECTS.—The
2 Secretary shall conduct research, development,
3 demonstration, and commercial application pro-
4 grams for—

5 “(i) the combined use of renewable
6 energy technologies with one another and
7 with other energy technologies, including
8 the combined use of renewable power and
9 fossil technologies;

10 “(ii) renewable energy technologies for
11 cogeneration of hydrogen and electricity;

12 “(iii) kinetic hydro turbines; and

13 “(iv) the Pioneering Energy Research
14 Program under section 262 of the ONE
15 Future Act.

16 “(b) RURAL DEMONSTRATION PROJECTS.—In car-
17 rying out this section, the Secretary, in consultation with
18 the Secretary of Agriculture, shall give priority to dem-
19 onstrations that assist in delivering electricity to rural and
20 remote locations including—

21 “(1) advanced renewable power technology, in-
22 cluding combined use with fossil technologies;

23 “(2) biomass; and

24 “(3) geothermal energy systems.

25 “(c) ANALYSIS AND EVALUATION.—

1 “(1) IN GENERAL.—The Secretary shall con-
2 duct analysis and evaluation in support of the re-
3 newable energy programs under this subtitle. These
4 activities shall be used to guide budget and program
5 decisions, and shall include—

6 “(A) economic and technical analysis of re-
7 newable energy potential, including resource as-
8 sessment;

9 “(B) analysis of past program perform-
10 ance, both in terms of technical advances and
11 in market introduction of renewable energy;

12 “(C) assessment of domestic and inter-
13 national market drivers, including the impacts
14 of any Federal, State, or local grants, loans,
15 loan guarantees, tax incentives, statutory or
16 regulatory requirements, or other government
17 initiatives; and

18 “(D) any other analysis or evaluation that
19 the Secretary considers appropriate.

20 “(2) FUNDING.—The Secretary may designate
21 up to 1 percent of the funds appropriated for car-
22 rying out this subtitle for analysis and evaluation ac-
23 tivities under this subsection.

24 “(3) SUBMITTAL TO CONGRESS.—This analysis
25 and evaluation shall be submitted to the Committee

1 on Science, Space, and Technology of the House of
2 Representatives and the Committee on Energy and
3 Natural Resources of the Senate at least 30 days be-
4 fore each annual budget request is submitted to
5 Congress.”.

6 **SEC. 248. BIOENERGY PROGRAM.**

7 Section 932 of the Energy Policy Act of 2005 (42
8 U.S.C. 16232) is amended to read as follows:

9 **“SEC. 932. BIOENERGY PROGRAM.**

10 “(a) PROGRAM.—The Secretary shall conduct a pro-
11 gram of research, development, demonstration, and com-
12 mercial application for bioenergy, including innovations
13 in—

14 “(1) biopower energy systems;

15 “(2) biofuels;

16 “(3) bioproducts;

17 “(4) integrated biorefineries that may produce
18 biopower, biofuels, and bioproducts; and

19 “(5) cross-cutting research and development in
20 feedstocks.

21 “(b) BIOFUELS AND BIOPRODUCTS.—The goals of
22 the biofuels and bioproducts programs shall be to develop,
23 in partnership with industry and institutions of higher
24 education—

1 “(1) advanced biochemical and thermochemical
2 conversion technologies capable of making fuels from
3 lignocellulosic feedstocks that are price-competitive
4 with fossil-based fuels and fully compatible with ei-
5 ther internal combustion engines or fuel cell-powered
6 vehicles;

7 “(2) advanced biotechnology processes capable
8 of making biofuels and bioproducts with emphasis on
9 development of biorefinery technologies using en-
10 zyme-based processing systems; and

11 “(3) other advanced processes that will enable
12 the development of cost-effective bioproducts, includ-
13 ing biofuels.

14 “(d) RETROFIT TECHNOLOGIES FOR THE DEVELOP-
15 MENT OF ETHANOL FROM CELLULOSIC MATERIALS.—

16 The Secretary shall establish a program of research, devel-
17 opment, demonstration, and commercial application for
18 technologies and processes to enable biorefineries that ex-
19 clusively use corn grain or corn starch as a feedstock to
20 produce ethanol to be retrofitted to accept a range of bio-
21 mass, including lignocellulosic feedstocks.

22 “(c) DEFINITIONS.—In this section:

23 “(1) BIOMASS.—The term ‘biomass’ means—

24 “(A) any organic material grown for the
25 purpose of being converted to energy;

1 “(B) any organic byproduct of agriculture
2 (including wastes from food production and
3 processing) that can be converted into energy;
4 or

5 “(C) any waste material that can be con-
6 verted to energy, is segregated from other waste
7 materials, and is derived from—

8 “(i) any of the following forest-related
9 resources: mill residues, precommercial
10 thinnings, slash, brush, or otherwise non-
11 merchantable material;

12 “(ii) wood waste materials, including
13 waste pallets, crates, dunnage, manufac-
14 turing and construction wood wastes (other
15 than pressure-treated, chemically treated,
16 or painted wood wastes), and landscape or
17 right-of-way tree trimmings, but not in-
18 cluding municipal solid waste, gas derived
19 from the biodegradation of municipal solid
20 waste, or paper that is commonly recycled;
21 or

22 “(iii) solids derived from waste water
23 treatment processes.

24 “(2) LIGNOCELLULOSIC FEEDSTOCK.—The
25 term ‘lignocellulosic feedstock’ means any portion of

1 a plant or coproduct from conversion, including
2 crops, trees, forest residues, and agricultural resi-
3 dues not specifically grown for food, including from
4 barley grain, grapeseed, rice bran, rice hulls, rice
5 straw, soybean matter, and sugarcane bagasse.”.

6 **SEC. 249. CONCENTRATING SOLAR POWER RESEARCH PRO-**
7 **GRAM.**

8 Section 934 of the Energy Policy Act of 2005 (42
9 U.S.C. 16234) is repealed.

10 **SEC. 250. RENEWABLE ENERGY IN PUBLIC BUILDINGS.**

11 Section 935 of the Energy Policy Act of 2005 (42
12 U.S.C. 16235) and the item relating thereto in the table
13 of contents of that Act are repealed.

14 **Subtitle D—Fossil Energy Research**
15 **and Development**

16 **SEC. 261. FOSSIL ENERGY.**

17 Section 961 of Energy Policy Act of 2005 (42 U.S.C.
18 16291) is amended to read as follows:

19 **“SEC. 961. FOSSIL ENERGY.**

20 **“(a) IN GENERAL.—**The Secretary shall carry out re-
21 search, development, demonstration, and commercial ap-
22 plication programs in fossil energy, including activities
23 under this subtitle, with the goal of improving the effi-
24 ciency, effectiveness, and environmental performance of
25 fossil energy production, upgrading, conversion, and con-

1 sumption. Such programs shall take into consideration the
2 following objectives:

3 “(1) Increasing the energy conversion efficiency
4 of all forms of fossil energy through improved tech-
5 nologies.

6 “(2) Decreasing the cost of all fossil energy
7 production, generation, and delivery.

8 “(3) Promoting diversity of energy supply.

9 “(4) Decreasing the dependence of the United
10 States on foreign energy supplies.

11 “(5) Improving United States energy security.

12 “(6) Decreasing the environmental impact of
13 energy-related activities.

14 “(7) Increasing the export of fossil energy-re-
15 lated equipment, technology, and services from the
16 United States.

17 “(b) LIMITATIONS.—

18 “(1) USES.—None of the funds authorized for
19 carrying out this section may be used for Fossil En-
20 ergy Environmental Restoration.

21 “(2) INSTITUTIONS OF HIGHER EDUCATION.—

22 Not less than 20 percent of the funds appropriated
23 for carrying out section 964 of this Act for each fis-
24 cal year shall be dedicated to research and develop-
25 ment carried out at institutions of higher education.

1 “(3) USE FOR REGULATORY ASSESSMENTS OR
2 DETERMINATIONS.—The results of any research, de-
3 velopment, demonstration, or commercial application
4 projects or activities of the Department may not be
5 used for regulatory assessments or determinations
6 by Federal regulatory authorities.

7 “(c) ASSESSMENTS.—

8 “(1) CONSTRAINTS AGAINST BRINGING RE-
9 SOURCES TO MARKET.—Not later than 1 year after
10 the date of enactment of the ONE Future Act, the
11 Secretary shall transmit to Congress an assessment
12 of the technical, institutional, policy, and regulatory
13 constraints to bringing new domestic fossil resources
14 to market.

15 “(2) TECHNOLOGY CAPABILITIES.—Not later
16 than 2 years after the date of enactment of the
17 ONE Future Act, the Secretary shall transmit to
18 Congress a long-term assessment of existing and
19 projected technological capabilities for expanded pro-
20 duction from domestic unconventional oil, gas, and
21 methane reserves.”.

22 **SEC. 262. PIONEERING ENERGY RESEARCH.**

23 (a) ESTABLISHMENT.—The Secretary, in conjunction
24 with the program consortium selected under subsection
25 (d), shall establish and carry out a public-private partner-

1 ship Pioneering Energy Research Program for research,
2 development, demonstration, and commercial application
3 of technologies to maximize domestic energy production,
4 improve environmental stewardship, ensure domestic en-
5 ergy security, and maintain global energy leadership.

6 (b) COVERED ACTIVITIES.—The program under this
7 section shall include research, development, demonstra-
8 tion, and commercial application on—

9 (1) natural gas and other petroleum resource
10 exploration, production and consumption, including
11 technologies and processes to improve well and pipe-
12 line integrity, improve understanding of fluid flow
13 and storage, reduce surface footprints, and improve
14 water management technologies in conventional and
15 unconventional resources;

16 (2) alternative liquid transportation fuel activi-
17 ties, including integration of biomass and natural
18 gas for transportation fuels production, cleaner
19 fuels, renewable liquid fuels other than ethanol, nat-
20 ural gas vehicles, and other innovative fossil-based
21 fuels;

22 (3) energy system risk management, optimiza-
23 tion, resiliency, and integration;

24 (4) hydraulic fracturing and shale petroleum,
25 including the establishment and continued operation

1 of one or more Hydraulic Fracturing Test Sites to
2 address efficiency, safety, and environmental sus-
3 tainability of hydraulic fracturing and shale petro-
4 leum technologies;

5 (5) small producer technology challenges, in-
6 cluding improving well integrity and efficiency;

7 (6) subsurface energy exploration and produc-
8 tion, including geothermal energy;

9 (7) interstate and intrastate natural gas pipe-
10 line and distribution system integrity management;
11 and

12 (8) other domestic energy challenges as identi-
13 fied by the Secretary or the program consortium and
14 included in the annual plan prepared under sub-
15 section (i).

16 (c) ROLE OF THE SECRETARY.—The Secretary shall
17 have ultimate responsibility for, and oversight of, all as-
18 pects of the program under this section. The Secretary
19 may not assign any activities to the program consortium
20 except as specifically authorized under this section.

21 (d) SELECTION OF THE PROGRAM CONSORTIUM.—

22 (1) IN GENERAL.—Not later than 180 days
23 after the date of enactment of this Act, the Sec-
24 retary shall select the program consortium through
25 an open, competitive process.

1 (2) REQUIREMENT OF SECTION 501(c)(3) STA-
2 TUS.—The Secretary shall not select a program con-
3 sortium under this section unless such consortium is
4 an organization described in section 501(c)(3) of the
5 Internal Revenue Code of 1986 and exempt from tax
6 under such section 501(a) of such Code.

7 (e) ROLE OF THE PROGRAM CONSORTIUM.—Upon
8 approval of the Secretary, the program consortium shall—

9 (1) administer the program, to the extent pro-
10 vided under subsection (c);

11 (2) issue research project solicitations;

12 (3) make project awards to research per-
13 formers;

14 (4) disburse research funds awarded under this
15 section to research performers in accordance with
16 the annual plan prepared under subsection (i); and

17 (5) carry out other activities assigned to the
18 program consortium or as provided in the annual
19 plan.

20 (f) ADMINISTRATIVE COSTS.—To compensate the
21 program consortium for carrying out its activities under
22 this section, the Secretary shall provide to the program
23 consortium up to 10 percent of the total appropriation for
24 carrying out this section each fiscal year.

1 (g) COORDINATION.—In carrying out this section, the
2 Secretary and the program consortium shall promote co-
3 ordination and cooperation among program offices at the
4 Department.

5 (h) COMPLEMENTARY RESEARCH.—The Secretary,
6 through the National Renewable Energy Laboratory and
7 the National Energy Technology Laboratory, shall carry
8 out research and other activities complementary to and
9 supportive of the program authorized under this section.
10 Up to 12.5 percent of appropriated program funds each
11 fiscal year shall be for complementary research conducted
12 by the National Energy Technology Laboratory and the
13 National Renewable Energy Laboratory.

14 (i) ANNUAL PLAN.—

15 (1) DEVELOPMENT.—Not later than 1 year
16 after the date of enactment of this Act, and annually
17 thereafter, the program consortium shall develop,
18 and transmit to the Secretary, the Committee on
19 Science, Space, and Technology of the House of
20 Representatives, and the Committee on Energy and
21 Natural Resources of the Senate, a plan for activi-
22 ties under this section, including the distribution of
23 Program funds, which shall be reviewed and ap-
24 proved within 60 days by the Secretary.

1 (2) CONTENTS.—The annual plan shall describe
2 the ongoing and prospective activities of the pro-
3 gram under this section and shall include a list of
4 any solicitations for awards to carry out research,
5 development, demonstration, and commercial appli-
6 cation activities, including specifics on the topics for
7 such work, who would be eligible to apply, selection
8 criteria, and the duration of awards.

9 (j) AWARDS.—

10 (1) IN GENERAL.—Upon approval of the Sec-
11 retary, the program consortium shall make awards
12 to research performers to carry out research, devel-
13 opment, demonstration, and commercial application
14 activities under this section.

15 (2) OVERSIGHT.—

16 (A) IN GENERAL.—The program consor-
17 tium shall oversee the implementation of
18 awards under this subsection, consistent with
19 the annual plan developed under subsection (i),
20 including disbursing funds and monitoring ac-
21 tivities carried out under such awards for com-
22 pliance with the terms and conditions of the
23 awards.

24 (B) EFFECT.—Nothing in subparagraph

25 (A) shall limit the authority or responsibility of

1 the Secretary to oversee awards, or limit the
2 authority of the Secretary to review or revoke
3 awards.

4 (k) AUTHORIZATION OF APPROPRIATIONS.—There
5 are authorized to be appropriated to the Secretary, to re-
6 main available until expended, for carrying out this sec-
7 tion—

8 (1) \$50,000,000, to be derived from amounts
9 appropriated under section 291(c); and

10 (2) \$50,000,000, to be derived from amounts
11 appropriated under section 291(d).

12 **SEC. 263. RESEARCH, DEVELOPMENT, DEMONSTRATION,**
13 **AND COMMERCIAL APPLICATION PROGRAMS.**

14 (a) IN GENERAL.—Section 962 of the Energy Policy
15 Act of 2005 (42 U.S.C. 16292) is amended—

16 (1) in subsection (a)—

17 (A) in paragraph (10), by striking “and”
18 at the end;

19 (B) in paragraph (11), by striking the pe-
20 riod at the end and inserting a semicolon; and

21 (C) by adding at the end the following:

22 “(12) specific additional programs to address
23 water use and reuse;

24 “(13) the testing, including the construction of
25 testing facilities, of high temperature materials for

1 use in advanced systems for combustion or use of
2 coal; and

3 “(14) innovations to application of existing coal
4 conversion systems designed to increase efficiency of
5 conversion, flexibility of operation, and other modi-
6 fications to address existing usage requirements.”;

7 (2) by redesignating subsections (b) through (d)
8 as subsections (c) through (e), respectively;

9 (3) by inserting after subsection (a) the fol-
10 lowing:

11 “(b) TRANSFORMATIONAL COAL TECHNOLOGY PRO-
12 GRAM.—

13 “(1) IN GENERAL.—As part of the program es-
14 tablished under subsection (a), the Secretary may
15 carry out a program designed to undertake research,
16 development, demonstration, and commercial appli-
17 cation of technologies, including the accelerated de-
18 velopment of—

19 “(A) chemical looping technology;

20 “(B) supercritical carbon dioxide power
21 generation cycles;

22 “(C) pressurized oxycombustion, including
23 new and retrofit technologies; and

24 “(D) other technologies that are character-
25 ized by the use of—

- 1 “(i) alternative energy cycles;
- 2 “(ii) thermionic devices using waste
- 3 heat;
- 4 “(iii) fuel cells;
- 5 “(iv) replacement of chemical proc-
- 6 esses with biotechnology;
- 7 “(v) nanotechnology;
- 8 “(vi) new materials in applications
- 9 (other than extending cycles to higher tem-
- 10 perature and pressure), such as mem-
- 11 branes or ceramics;
- 12 “(vii) carbon utilization, such as in
- 13 construction materials, using low quality
- 14 energy to reconvert back to a fuel, or man-
- 15 ufactured food;
- 16 “(viii) advanced gas separation con-
- 17 cepts; and
- 18 “(ix) other technologies, including—
- 19 “(I) modular, manufactured com-
- 20 ponents; and
- 21 “(II) innovative production or re-
- 22 search techniques, such as using 3-D
- 23 printer systems, for the production of
- 24 early research and development proto-
- 25 types.

1 “(2) COST SHARE.—In carrying out the pro-
2 gram described in paragraph (1), the Secretary shall
3 enter into partnerships with private entities to share
4 the costs of carrying out the program. The Secretary
5 may reduce or eliminate the non-Federal cost share
6 requirement if the Secretary determines that the re-
7 duction or elimination is necessary and appropriate
8 considering the technological risks involved in the
9 project.”; and

10 (4) in subsection (c) (as so redesignated)—

11 (A) by striking paragraph (1) and insert-
12 ing the following:

13 “(1) IN GENERAL.—In carrying out programs
14 authorized by this section, the Secretary shall iden-
15 tify cost and performance goals for coal-based tech-
16 nologies that would permit the continued cost-com-
17 petitive use of coal for the production of electricity,
18 chemical feedstocks, transportation fuels, and other
19 marketable products.”; and

20 (B) in paragraph (2), by striking “date of
21 enactment of this Act” each place it appears
22 and inserting “date of enactment of the ONE
23 Future Act”.

1 (b) ADVISORY COMMITTEE; AUTHORIZATION OF AP-
2 PROPRIATIONS.—Section 963 of the Energy Policy Act of
3 2005 (42 U.S.C. 16293) is amended—

4 (1) by amending paragraph (6) of subsection
5 (c) to read as follows:

6 “(6) ADVISORY COMMITTEE.—

7 “(A) IN GENERAL.—Subject to subpara-
8 graph (B), the Secretary shall establish an advi-
9 sory committee to undertake, not less fre-
10 quently than once every 3 years, a review and
11 prepare a report on the progress being made by
12 the Department of Energy to achieve the goals
13 described in subsections (a) and (b) of section
14 962 and subsection (b) of this section.

15 “(B) MEMBERSHIP REQUIREMENTS.—
16 Members of the advisory committee established
17 under subparagraph (A) shall be appointed by
18 the Secretary.”; and

19 (2) by amending subsection (d) to read as fol-
20 lows:

21 “(d) STUDY OF CARBON DIOXIDE PIPELINES.—Not
22 later than 1 year after the date of enactment of the ONE
23 Future Act, the Secretary shall transmit to Congress the
24 results of a study to assess the cost and feasibility of engi-

1 neering, permitting, building, maintaining, regulating, and
2 insuring a national system of carbon dioxide pipelines.”.

3 **SEC. 264. HIGH EFFICIENCY GAS TURBINES RESEARCH AND**
4 **DEVELOPMENT.**

5 (a) IN GENERAL.—The Secretary, through the Office
6 of Fossil Energy, shall carry out a multiyear, multiphase
7 program of research, development, demonstration, and
8 commercial application to innovate technologies to maxi-
9 mize the efficiency of gas turbines used in power genera-
10 tion systems.

11 (b) PROGRAM ELEMENTS.—The program under this
12 section shall—

13 (1) support innovative engineering and detailed
14 gas turbine design for megawatt-scale and utility-
15 scale electric power generation, including—

16 (A) high temperature materials, including
17 superalloys, coatings, and ceramics;

18 (B) improved heat transfer capability;

19 (C) manufacturing technology required to
20 construct complex three-dimensional geometry
21 parts with improved aerodynamic capability;

22 (D) combustion technology to produce
23 higher firing temperature while lowering nitro-
24 gen oxide and carbon monoxide emissions per
25 unit of output;

1 (E) advanced controls and systems integra-
2 tion;

3 (F) advanced high performance compressor
4 technology; and

5 (G) validation facilities for the testing of
6 components and subsystems;

7 (2) include technology demonstration through
8 component testing, subscale testing, and full scale
9 testing in existing fleets;

10 (3) include field demonstrations of the devel-
11 oped technology elements so as to demonstrate tech-
12 nical and economic feasibility; and

13 (4) assess overall combined cycle and simple
14 cycle system performance.

15 (c) PROGRAM GOALS.—The goals of the multiphase
16 program established under subsection (a) shall be—

17 (1) in phase I—

18 (A) to develop the conceptual design of ad-
19 vanced high efficiency gas turbines that can
20 achieve at least 62 percent combined cycle effi-
21 ciency or 47 percent simple cycle efficiency on
22 a lower heating value basis; and

23 (B) to develop and demonstrate the tech-
24 nology required for advanced high efficiency gas
25 turbines that can achieve at least 62 percent

1 combined cycle efficiency or 47 percent simple
2 cycle efficiency on a lower heating value basis;
3 and

4 (2) in phase II, to develop the conceptual de-
5 sign for advanced high efficiency gas turbines that
6 can achieve at least 65 percent combined cycle effi-
7 ciency or 50 percent simple cycle efficiency on a
8 lower heating value basis.

9 (d) PROPOSALS.—Within 180 days after the date of
10 enactment of this Act, the Secretary shall solicit grant and
11 contract proposals from industry, small businesses, univer-
12 sities, and other appropriate parties for conducting activi-
13 ties under this section. In selecting proposals, the Sec-
14 retary shall emphasize—

15 (1) the extent to which the proposal will stimu-
16 late the creation or increased retention of jobs in the
17 United States; and

18 (2) the extent to which the proposal will pro-
19 mote and enhance United States technology leader-
20 ship.

21 (e) COMPETITIVE AWARDS.—The provision of fund-
22 ing under this section shall be on a competitive basis with
23 an emphasis on technical merit.

1 (f) COST SHARING.—Section 988 of the Energy Pol-
2 icy Act of 2005 (42 U.S.C. 16352) shall apply to an award
3 of financial assistance made under this section.

4 **Subtitle E—Advanced Research**
5 **Projects Agency—Energy**

6 **SEC. 281. ARPA-E AMENDMENTS.**

7 Section 5012 of the America COMPETES Act (42
8 U.S.C. 16538) is amended—

9 (1) by amending paragraph (1) of subsection
10 (c) to read as follows:

11 “(1) IN GENERAL.—The goals of ARPA-E
12 shall be to enhance the economic and energy security
13 of the United States and to ensure that the United
14 States maintains a technological lead through the
15 development of advanced energy technologies.”;

16 (2) in subsection (i)(1), by inserting “ARPA-E
17 shall not provide funding for a project unless the
18 prospective grantee demonstrates sufficient attempts
19 to secure private financing as to indicate that the
20 project is not independently commercially viable.”
21 after “relevant research agencies.”;

22 (3) in subsection (l)(1), by inserting “and once
23 every 6 years thereafter,” after “operation for 6
24 years,”; and

1 (4) by redesignating subsection (n) as sub-
2 section (o) and inserting after subsection (m) the
3 following new subsection:

4 “(n) PROTECTION OF PROPRIETARY INFORMA-
5 TION.—

6 “(1) IN GENERAL.—The following categories of
7 information collected by the Advanced Research
8 Projects Agency–Energy from recipients of financial
9 assistance awards shall be considered privileged and
10 confidential and not subject to disclosure pursuant
11 to section 552 of title 5, United States Code:

12 “(A) Plans for commercialization of tech-
13 nologies developed under the award, including
14 business plans, technology to market plans,
15 market studies, and cost and performance mod-
16 els.

17 “(B) Investments provided to an awardee
18 from third parties, such as venture capital,
19 hedge fund, or private equity firms, including
20 amounts and percentage of ownership of the
21 awardee provided in return for such invest-
22 ments.

23 “(C) Additional financial support that the
24 awardee plans to invest or has invested into the

1 technology developed under the award, or that
2 the awardee is seeking from third parties.

3 “(D) Revenue from the licensing or sale of
4 new products or services resulting from the re-
5 search conducted under the award.

6 “(2) EFFECT OF SUBSECTION.—Nothing in this
7 subsection affects—

8 “(A) the authority of the Secretary to use
9 information without publicly disclosing such in-
10 formation; or

11 “(B) the responsibility of the Secretary to
12 transmit information to Congress as required
13 by law.”.

14 **Subtitle F—Miscellaneous**

15 **SEC. 291. AUTHORIZATION OF APPROPRIATIONS.**

16 (a) CROSSCUTTING PROGRAMS.—There are author-
17 ized to be appropriated to the Secretary for—

18 (1) research, development, demonstration, and
19 commercial application for Electrical Delivery and
20 Energy Reliability Research and Development activi-
21 ties within the Office of Electricity, \$105,700,000
22 for fiscal year 2014; and

23 (2) research, development, demonstration, and
24 commercial application for crosscutting programs
25 within the Department \$145,700,000 for fiscal year

1 2015, including up to \$105,700,000 for Electrical
2 Delivery and Energy Reliability Research and Devel-
3 opment activities within the Office of Electricity.

4 (b) NUCLEAR ENERGY.—

5 (1) IN GENERAL.—There are authorized to be
6 appropriated to the Secretary for research, develop-
7 ment, demonstration, and commercial application for
8 nuclear energy technology activities within the Office
9 of Nuclear Energy \$488,630,000 for each of fiscal
10 years 2014 and 2015.

11 (2) LIMITATION.—Any amounts made available
12 pursuant to the authorization of appropriations
13 under paragraph (1) shall not be derived from the
14 Nuclear Waste Fund established under section
15 302(c) of the Nuclear Waste Policy Act of 1982 (42
16 U.S.C. 10222(c)).

17 (c) ENERGY EFFICIENCY AND RENEWABLE EN-
18 ERGY.—There are authorized to be appropriated to the
19 Secretary for research, development, demonstration, and
20 commercial application for energy efficiency and renewable
21 energy technology activities within the Office of Energy
22 Efficiency and Renewable Energy—

23 (1) \$1,683,486,000 for fiscal year 2014; and

24 (2) \$1,197,631,000 for fiscal year 2015.

1 (d) FOSSIL ENERGY.—There are authorized to be ap-
2 propriated to the Secretary for research, development,
3 demonstration, and commercial application for fossil en-
4 ergy technology activities within the Office of Fossil En-
5 ergy \$561,931,000 for each of fiscal years 2014 and 2015.

6 (e) ARPA-E.—There are authorized to be appro-
7 priated to the Secretary for the Advanced Research
8 Projects Agency–Energy—

9 (1) \$280,000,000 for fiscal year 2014; and

10 (2) \$240,000,000 for fiscal year 2015.

11 **SEC. 292. DEFINITIONS.**

12 In this title—

13 (1) the term “Department” means the Depart-
14 ment of Energy; and

15 (2) the term “Secretary” means the Secretary
16 of Energy.

○