I

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

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A BILL

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

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SECTION 1. SHORT TITLE; TABLE OF CONTENTS.

(a) SHORT TITLE.—This Act may be cited as the ''Department of Energy Research and Development Act of 2014''.

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

TITLE I—EINSTEIN ACT

SEC. 101. SHORT TITLE.

This title may be cited as the ''Enabling Innovation for Science, Technology, and Energy in America Act of 2014'' or the ''EINSTEIN Act''.

Subtitle A—Office of Science

SEC. 111. MISSION.

Section 209 of the Department of Energy Organization Act (42 U.S.C. 7139) is amended by adding at the end the following:

''(c) MISSION.—The mission of the Office of Science shall be the delivery of scientific discoveries, capabilities, and major scientific tools to transform the understanding of nature and to advance the energy, economic, and national security of the United States. In support of this mission, the Director shall carry out programs on basic energy sciences, advanced scientific computing research, high energy physics, biological and environmental research, fusion energy sciences, and nuclear physics, including as provided under subtitle A of the Enabling Innovation for Science, Technology, and Energy in America Act of 2014, through activities focused on—

''(1) fundamental scientific discoveries through the study of matter and energy;

''(2) science for national need, including—

''(A) advancing an agenda for American energy independence through research on energy production, storage, transmission, efficiency, and use; and

''(B) advancing our understanding of the Earth's climate through research in atmospheric and environmental sciences; and

''(3) National Scientific User Facilities to deliver the 21st century tools of science, engineering, and technology and provide the Nation's researchers

with the most advanced tools of modern science including accelerators, colliders, supercomputers, light sources and neutron sources, and facilities for studying materials science.

''(d) COORDINATION WITH OTHER DEPARTMENT OF ENERGY PROGRAMS.—The Under Secretary for Science and Energy shall ensure the coordination of Office of Science activities and programs with other activities of the Department.''.

SEC. 112. BASIC ENERGY SCIENCES.

(a) PROGRAM.—The Director shall carry out a program in basic energy sciences, including materials sciences and engineering, chemical sciences, physical biosciences, and geosciences, for the purpose of providing the scientific foundations for new energy technologies.

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

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

tional user facilities to support the program under this section. As practicable, these facilities shall serve the needs of the Department, industry, the academic community, and other relevant entities to create and examine new materials and chemical processes for the purposes of advancing new energy technologies and improving the competitiveness of the United States. These facilities shall include—

(1) x-ray light sources;

(2) neutron sources;

(3) nanoscale science research centers; and

(4) other facilities the Director considers appropriate, consistent with section 209 of the Department of Energy Organization Act (42 U.S.C. 7139).

(d) LIGHT SOURCE LEADERSHIP INITIATIVE.—

(1) ESTABLISHMENT.—In support of the subprogram authorized in subsection (c), the Director shall establish an initiative to sustain and advance global leadership of light source user facilities.

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

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

(A) identifies, prioritizes, and describes plans for the development, construction, and operation of light sources over the next decade;

(B) describes plans for optimizing management and use of existing light source facilities; and

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

(3) ADVISORY COMMITTEE FEEDBACK AND RECOMMENDATIONS.—Not later than 45 days after submission of the strategy described in paragraph (2), the Basic Energy Sciences Advisory Committee shall provide the Director, the Committee on Science, Space, and Technology of the House of Representatives, and the Committee on Energy and Natural Resources of the Senate a report of the Advisory Committee's analyses, findings, and recommendations for improving the strategy, including a review of the most recent budget request for the initiative.

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

corresponding to the activities identified in the strategy.

(e) ACCELERATOR RESEARCH AND DEVELOPMENT.—The Director shall carry out research and development on advanced accelerator and storage ring technologies relevant to the development of Basic Energy Sciences user facilities, in consultation with the Office of Science's High Energy Physics and Nuclear Physics programs.

(f) EPSCoR.—

(1) CONTINUATION OF PROGRAM.—The Secretary shall continue to carry out the Experimental Program to Stimulate Competitive Research, established at the Department of Energy under section 2203(b)(3) of the Energy Policy Act of 1992 (42 U.S.C. 13503(b)(3)) (in this subsection referred to as ''EPSCoR''), with the objective of expanding the research capabilities of the eligible States to enable them to better address the many energy and energy-related issues that confront their States and the Nation on a daily basis.

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

as well as to identify other opportunities to advance the Department's research priorities. The Secretary shall ensure that the process for nominating members to such advisory committees and review panels considers candidates from a broad range of geographic locations, with an objective of reflecting an expansive geographic distribution of research universities.

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

(A) the total research funding made available by the Department to each State in the Nation;

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

(C) the total amount of Department research funding made available to all institutions and entities within EPSCoR States;

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

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

(F) efforts and accomplishments to more fully integrate the EPSCoR States in major activities and initiatives of the Department.

(4) AUTHORIZATION OF APPROPRIATIONS.—There are authorized to be appropriated to the Secretary of Energy for the EPSCoR program for fiscal year 2015, $22,000,000.

SEC. 113. ADVANCED SCIENTIFIC COMPUTING RESEARCH.

(a) PROGRAM.—The Director shall carry out a research, development, demonstration, and commercial application program to advance computational and networking capabilities to analyze, model, simulate, and predict complex phenomena relevant to the development of new energy technologies and the competitiveness of the United States.

(b) FACILITIES.—The Director, as part of the program described in subsection (a), shall develop and maintain world-class computing and network facilities for science and deliver critical research in applied mathematics, computer science, and advanced networking to support the Department's missions.

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

''(1) CO-DESIGN.—The term 'co-design' means the joint development of application algorithms, models, and codes with computer technology architectures and operating systems to maximize effective use of high-end computing systems.

''(2) DEPARTMENT.—The term 'Department' means the Department of Energy.

''(3) EXASCALE.—The term 'exascale' means computing system performance at or near 10 to the 18th power floating point operations per second.

''(4) HIGH-END COMPUTING SYSTEM.—The term 'high-end computing system' means a computing system with performance that substantially exceeds that of systems that are commonly available for advanced scientific and engineering applications.

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

''(6) LEADERSHIP SYSTEM.—The term 'Leadership System' means a high-end computing system

that is among the most advanced in the world in terms of performance in solving scientific and engineering problems.

''(7) NATIONAL LABORATORY.—The term 'National Laboratory' means any one of the seventeen laboratories owned by the Department.

''(8) SECRETARY.—The term 'Secretary' means the Secretary of Energy.

''(9) SOFTWARE TECHNOLOGY.—The term 'software technology' includes optimal algorithms, programming environments, tools, languages, and operating systems for high-end computing systems.''.

(d) DEPARTMENT OF ENERGY HIGH-END COMPUTING RESEARCH AND DEVELOPMENT PROGRAM.—Section 3 of the Department of Energy High-End Computing Revitalization Act of 2004 (15 U.S.C. 5542) is amended—

(1) in subsection (a)—

(A) in paragraph (1), by striking ''program'' and inserting ''coordinated program across the Department'';

(B) by striking ''and'' at the end of paragraph (1);

(C) by striking the period at the end of paragraph (2) and inserting ''; and''; and

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

''(3) partner with universities, National Laboratories, and industry to ensure the broadest possible application of the technology developed in this program to other challenges in science, engineering, medicine, and industry.'';

(2) in subsection (b)(2), by striking ''vector'' and all that follows through ''architectures'' and inserting ''computer technologies that show promise of substantial reductions in power requirements and substantial gains in parallelism of multicore processors, concurrency, memory and storage, bandwidth, and reliability'';

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

''(3) in concert with architecture development efforts, conduct research in applied mathematics, computer science, and software development, including—

''(A) research on operating systems, programming environments, and languages to support advanced architectures; and

''(B) research on mathematical modeling and computational algorithms that enable sim-

ulation and data analysis of large-scale scientific problems and design of engineered systems on advanced architectures;''; and

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

''(d) EXASCALE COMPUTING PROGRAM.—

''(1) IN GENERAL.—The Secretary shall conduct a coordinated research and development program to develop exascale computing systems to advance the missions of the Department.

''(2) EXECUTION.—The Secretary shall, on a competitive, merit-reviewed basis, establish 2 or more National Laboratory-industry-university partnerships to conduct integrated research, development, and engineering of multiple exascale architectures, and—

''(A) conduct mission-related co-design activities in developing exascale platforms;

''(B) develop those advancements in hardware and software technology required to fully realize the potential of an exascale production system in addressing Department target applications and solving scientific problems involving predictive modeling and simulation and large-scale data analytics and management; and

"(C) explore the use of exascale computing technologies to advance a broad range of science and engineering.

"(3) ADMINISTRATION.—In carrying out this program, the Secretary shall—

"(A) provide, on a competitive, merit-reviewed basis, access for researchers in United States industry, institutions of higher education, National Laboratories, and other Federal agencies to exascale systems, as appropriate; and

"(B) conduct outreach programs to increase the readiness for the use of exascale platforms by domestic industries, including manufacturers.

"(4) REPORTS.—

"(A) INTEGRATED STRATEGY AND PROGRAM MANAGEMENT PLAN.—The Secretary shall submit to Congress, not later than 90 days after the date of enactment of the Enabling Innovation for Science, Technology, and Energy in America Act of 2014, a report outlining an integrated strategy and program management plan, including target dates for prototypical and production exascale platforms,

interim milestones to reaching these targets, functional requirements, roles and responsibilities of National Laboratories and industry, acquisition strategy, and estimated resources required, to achieve this exascale system capability. The report shall include the Secretary's plan for Departmental organization to manage and execute the Exascale Computing Program, including definition of the roles and responsibilities within the Department to ensure an integrated program across the Department. The report shall also include a plan for ensuring balance and prioritizing across ASCR subprograms in a flat or slow-growth budget environment.

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

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

''(i) the proposed facility's cost projections and capabilities to significantly accelerate the development of new energy technologies;

''(ii) technical risks and challenges that must be overcome to achieve successful completion and operation of the facility; and

''(iii) an independent assessment of the scientific and technological advances expected from such a facility relative to those expected from a comparable investment in expanded research and applications at terascale-class and petascale-class computing facilities, including an evaluation of where investments should be made in the system software and algorithms to enable these advances.''.

SEC. 114. HIGH ENERGY PHYSICS.

(a) PROGRAM.—The Director shall carry out a research program on the elementary constituents of matter and energy and the nature of space and time.

(b) UNDERGROUND SCIENCE.—

(1) PURPOSE.—The Director shall create, preserve, and maintain United States facilities essential

to underground scientific research supported by the Department.

(2) REPORT.—Not later than 120 days after the date of enactment of this Act, and biennially thereafter, the Director shall submit to the Committee on Science, Space, and Technology of the House of Representatives and the Committee on Energy and Natural Resources of the Senate a report on the activities to steward national leadership in underground science, including—

(A) methods for coordination between activities carried out under this section and activities carried out under section 117;

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

(C) plans for sustaining and advancing United States leadership in underground science, particularly as they relate to development of scientific user facilities to explore the frontiers of particle physics and science in general; and

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

ation previous Department and National Research Council reports.

(3) GRANTS IN SUPPORT OF UNDERGROUND SCIENCE.—The Director shall carry out a competitive program to award grants to scientists and engineers at institutions of higher education, nonprofit institutions, and National Laboratories to conduct research in underground science.

(4) TRANSFER OF STEWARDSHIP.—If the Department determines that one or more underground research facilities are no longer required to carry out the program described in this section, the Secretary may designate another appropriate steward of underground research facilities. If such stewardship is transferred, the Secretary shall provide notification to Congress within 30 days.

(c) ACCELERATOR RESEARCH AND DEVELOPMENT.—The Director shall carry out research and development in advanced accelerator concepts and technologies, including laser technologies, to reduce the necessary scope and cost for the next generation of particle accelerators.

SEC. 115. BIOLOGICAL AND ENVIRONMENTAL RESEARCH.

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

ronmental science to support the energy and environmental missions of the Department.

(b) PRIORITY RESEARCH.—In carrying out this section, the Director shall prioritize fundamental research on biological systems and genomics science with the greatest potential to enable technological solutions for American energy independence.

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

(d) LIMITATION.—The Director shall not approve new climate science-related initiatives to be carried out through the Office of Science without making a determination that such work is unique and not duplicative of work by other Federal agencies. Not later than 3 months after receiving the assessment required under subsection (c), the Director shall cease those climate science-related initiatives identified in the assessment as overlapping or duplicative, unless the Director justifies that such work is critical to achieving American energy independence.

(e) LOW DOSE RADIATION RESEARCH PROGRAM.—

(1) IN GENERAL.—The Director shall carry out a research program on low dose radiation. The purpose of the program is to enhance the scientific understanding of and reduce uncertainties associated with the effects of exposure to low dose radiation in order to inform improved risk management methods.

(2) STUDY.—Not later than 60 days after the date of enactment of this Act, the Director shall enter into an agreement with the National Academies to conduct a study assessing the current status and development of a long-term strategy for low dose radiation research. The study shall be conducted in coordination with Federal agencies that perform ionizing radiation effects research and shall leverage the most current studies in this field. Such study shall—

(A) identify current scientific challenges for understanding the long-term effects of ionizing radiation;

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

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

(D) recommend a long-term strategic and prioritized research agenda to address scientific research goals for overcoming the identified scientific challenges in coordination with other research efforts;

(E) define the essential components of a research program that would address this research agenda within the universities and the National Laboratories; and

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

(3) RESEARCH PLAN.—Not later than 90 days after the completion of the study performed under paragraph (2) the Secretary shall deliver to the Committee on Science, Space, and Technology of the House of Representatives and the Committee on Energy and Natural Resources of the Senate a 5-year research plan that responds to the study's findings and recommendations and identifies and prioritizes research needs.

(4) DEFINITION.—In this subsection, the term ''low dose radiation'' means a radiation dose of less than 100 millisieverts.

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

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

SEC. 116. FUSION ENERGY.

(a) PROGRAM.—The Director shall carry out a fusion energy sciences research program to expand the fundamental understanding of plasmas and matter at very high temperatures and densities and to build the scientific foundation necessary to enable fusion power.

(b) PLAN.—Not later than 12 months after the date of enactment of this Act, the Director shall prepare, in consultation with relevant stakeholders including experts in fusion science and technology and engineering and operations, and submit to the Committee on Science, Space, and Technology of the House of Representatives and the Committee on Energy and Natural Resources of the Senate a plan to carry out the program set forth in subsection (a). The plan shall—

(1) outline the tasks required to resolve the remaining scientific, engineering, and materials challenges, including a schedule for accomplishing these tasks under various budget scenarios;

(2) identify priorities for initiation of facility construction and facility decommissioning under various budget scenarios;

(3) specify how existing domestic experimental capabilities and United States participation in the ITER project contribute to this effort, and what additional capabilities, including facilities for materials, plasma confinement, and fusion technologies and advances in large scale computer simulations may be needed within the United States;

(4) provide a strategy to develop conceptual designs for building a demonstration power plant including the associated cost and schedule under various budget scenarios, and address considerations with respect to operability, reliability, and maintainability; and

(5) describe options of involving international partners or collaborators and explain how such partnerships or collaborations might be leveraged to decrease costs or accelerate the schedule while enhancing United States leadership in fusion science and technology.

(c) ADVISORY COMMITTEE REPORT AND RECOMMENDATIONS.—Not later than 120 days after submission of the plan required under subsection (b), the Depart-

ment's Fusion Energy Science Advisory Committee shall provide the Director, the Committee on Science, Space, and Technology of the House of Representatives, and the Committee on Energy and Natural Resources of the Senate a report of its findings, analyses, and recommendations to improve the plan, including a review of the most recent budget request.

(d) ITER STUDY.—The Comptroller General shall conduct a study to identify uncertainties and the outlook regarding on-schedule completion of the International Thermonuclear Experimental Reactor. The study shall review, examine, and investigate any management and technical challenges, as well as financial risks, associated with the International Thermonuclear Experimental Reactor. Not later than 6 months after the date of enactment of this Act, the Comptroller General shall submit a report to Congress on the results of the study.

SEC. 117. NUCLEAR PHYSICS.

(a) PROGRAM.—The Director shall carry out a program of experimental and theoretical research, and support associated facilities, to discover, explore, and understand all forms of nuclear matter.

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

development of techniques to produce isotopes, that the Secretary determines are needed for research, medical, industrial, or other purposes. In making this determination, the Secretary shall—

(1) ensure that, as has been the policy of the United States since the publication in 1965 of Federal Register notice 30 Fed. Reg. 3247, isotope production activities do not compete with private industry unless critical national interests necessitate the Federal Government's involvement;

(2) ensure that activities undertaken pursuant to this section, to the extent practicable, promote the growth of a robust domestic isotope production industry; and

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

SEC. 118. SCIENCE LABORATORIES INFRASTRUCTURE PROGRAM.

(a) PROGRAM.—The Director shall carry out a program to improve the safety, efficiency, and mission readiness of infrastructure at Office of Science laboratories. The program shall include projects to—

(1) renovate or replace space that does not meet research needs;

(2) replace facilities that are no longer cost effective to renovate or operate;

(3) modernize utility systems to prevent failures and ensure efficiency;

(4) remove excess facilities to allow safe and efficient operations; and

(5) construct modern facilities to conduct advanced research in controlled environmental conditions.

(b) APPROACH.—In carrying out this section, the Director shall utilize all available approaches and mechanisms, including capital line items, minor construction projects, energy savings performance contracts, utility energy service contracts, alternative financing, and expense funding, as appropriate.

SEC. 119. AUTHORIZATION OF APPROPRIATIONS.

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

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

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

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

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

(5) $478,593,000 shall be for Advanced Scientific Computing Research;

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

(7) $97,818,000 shall be for Science Laboratories Infrastructure;

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

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

(10) $26,500,000 shall be for Workforce Development for Teachers and Scientists.

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

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

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

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

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

(5) $600,000,000 shall be for Advanced Scientific Computing Research;

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

(7) $79,189,000 shall be for Science Laboratories Infrastructure;

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

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

(10) $26,500,000 shall be for Workforce Development for Teachers and Scientists.

Subtitle B—Miscellaneous

SEC. 121. TRANSPARENCY.

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

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

(2) a justification for the reduction or elimination;

(3) the final cost share percentage;

(4) the amount of total cost share;

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

(6) a description of the supported project.

(b) TECHNOLOGY TRANSFER AGREEMENTS.—The Secretary shall make public, not later than 30 days after a National Laboratory enters into a technology transfer agreement with a nongovernment entity, basic, nonproprietary information related to such technology transfer agreement, including—

(1) Cooperative Research and Development Agreements;

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

(3) Agreements for Commercializing Technology under the pilot program described in section 127.

(c) FINANCIAL AWARDS.—The Secretary shall make public all grants, agreements, and other financial support for all research, development, demonstration, and commercial application activities within 30 days of an agreement. The information shall include—

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

(2) the amount of the award;

(3) a project description; and

(4) the expected timeframe of completion.

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

SEC. 122. NATIONAL ENERGY TECHNOLOGY LABORATORY.

(a) FINDING.—Congress finds that the Department of Energy owns 17 National Laboratories, 16 of which are contractor-operated. The National Energy Technology Laboratory is the exclusive Government-operated laboratory.

(b) ASSESSMENT.—Not later than 60 days after the date of enactment of this Act, the Under Secretary shall enter into an arrangement with the National Academy of Public Administration to conduct an assessment of the management and operations of the National Energy Technology Laboratory.

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

(1) compare laboratory management as a government-owned, government-operated model compared to a government-owned, contractor-operated model;

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

(3) identify a strategy for transitioning the laboratory to a government-owned, contractor-operated model.

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

SEC. 123. SAVINGS CLAUSE.

Nothing in this subtitle or an amendment made by this subtitle abrogates or otherwise affects the primary responsibilities of any National Laboratory to the Department.

SEC. 124. UNDER SECRETARY FOR SCIENCE AND ENERGY.

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

(1) by striking ''Under Secretary for Science'' each place it appears and inserting ''Under Secretary for Science and Energy''; and

(2) in paragraph (4)—

(A) in subparagraph (F), by striking ''and'' at the end;

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

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

''(H) establish appropriate linkages between offices under the jurisdiction of the Under Secretary; and

''(I) perform such functions and duties as the Secretary shall prescribe, consistent with this section.''.

(b) CONFORMING AMENDMENTS.—

(1) Section 3164(b)(1) of the Department of Energy Science Education Enhancement Act (42 U.S.C. 7381a(b)(1)) is amended by striking ''Under Secretary for Science'' and inserting ''Under Secretary for Science and Energy''.

(2) Section 641(h)(2) of the United States Energy Storage Competitiveness Act of 2007 (42 U.S.C. 17231(h)(2)) is amended by striking ''Under Secretary for Science'' and inserting ''Under Secretary for Science and Energy''.

SEC. 125. NATIONAL LABORATORIES OPERATIONS AND PERFORMANCE MANAGEMENT.

(a) IN GENERAL.—The Secretary shall ensure that the following duties and responsibilities are carried out through one or more appropriate statutory or administrative entities:

(1) Evaluation, coordination, and promotion of transfer of National Laboratory research and development results to the market in collaboration with the Technology Transfer Coordinator.

(2) Submission to the Secretary of reports describing recommendations for best practices for the National Laboratories including, with respect to management and operations procedures, conflict of interest regulations, engagement with the private sector, and technology transfer methodologies.

(3) Implementation of other duties, as the Secretary determines appropriate, to improve the operations and performance of the National Laboratories.

(b) REPORTING.—The Secretary, in consultation with the appropriate committees of Congress, shall provide an annual update on progress made in carrying out subsection (a), including the improvement of National Laboratory operations and performance and strategic departmental and National Laboratory coordination.

SEC. 126. SENSE OF CONGRESS ON AN INTEGRATED STRATEGY FOR NATIONAL LABORATORIES IN THE 21ST CENTURY.

It is the sense of Congress that—

(1) the establishment of the independent Commission to Review the Effectiveness of the National Energy Laboratories under section 319 of title III of division D of the Consolidated Appropriations Act, 2014, is an important step towards developing a coordinated strategy for the National Laboratories in the 21st century; and

(2) Congress looks forward to—

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

(B) engaging with the Administration—

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

(ii) to reform and modernize the operations and management of the National Laboratories.

SEC. 127. AGREEMENTS FOR COMMERCIALIZING TECHNOLOGY PILOT PROGRAM.

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

(b) TERMS.—Each agreement entered into pursuant to the pilot program referred to in subsection (a) shall provide to the contractor of the applicable National Laboratory, to the maximum extent determined to be appropriate by the Secretary, increased authority to negotiate contract terms, such as intellectual property rights, indemnification, payment structures, performance guarantees, and multiparty collaborations.

(c) ELIGIBILITY.—

(1) IN GENERAL.—Notwithstanding any other provision of law (including regulations), any National Laboratory may enter into an agreement pursuant to the pilot program referred to in subsection (a).

(2) AGREEMENTS WITH NON-FEDERAL ENTITIES.—To carry out paragraph (1) and subject to paragraph (3), the Secretary shall permit the directors of the National Laboratories to execute agreements with non-Federal entities, including non-Federal entities already receiving Federal funding that will be used to support activities under agreements executed pursuant to paragraph (1).

(3) RESTRICTION.—The requirements of chapter 18 of title 35, United States Code (commonly known as the ''Bayh-Dole Act'') shall apply if—

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

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

(d) SUBMISSION TO SECRETARY.—Each affected director of a National Laboratory shall submit to the Secretary, with respect to each agreement entered into under this section—

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

(2) the total estimated costs of the project;

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

(4) other documentation determined to be appropriate by the Secretary.

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

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

(2) does not present, or minimizes, any apparent conflict of interest, and avoids or neutralizes any

actual conflict of interest, as a result of the agreement under this section.

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

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

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

(2) identifies opportunities to improve the effectiveness of the pilot program;

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

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

SEC. 128. TECHNOLOGY TRANSFER.

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

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

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

(1) a cooperative research and development agreement;

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

(3) Agreements for Commercializing Technology entered into under the pilot program described in section 127.

(c) ADMINISTRATION.—

(1) ACCOUNTABILITY.—The director of the affected National Laboratory and the affected contractor shall carry out an agreement under this section in accordance with applicable policies of the Department, including by ensuring that the agreement does not compromise any national security, economic, or environmental interest of the United States.

(2) CERTIFICATION.—The director of the affected National Laboratory and the affected contractor shall certify that each activity carried out under a project for which an agreement is entered into under this section does not present, or minimizes, any apparent conflict of interest, and avoids

or neutralizes any actual conflict of interest, as a result of the agreement under this section.

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

(4) RATES.—The director of a National Laboratory may charge higher rates for services performed under a partnership agreement entered into pursuant to this section, regardless of the full cost of recovery.

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

(1) in subsection (a)—

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

(B) by striking ''Each Federal agency'' and inserting the following:

''(1) IN GENERAL.—Except as provided in paragraph (2), each Federal agency''; and

(C) by adding at the end the following:

''(2) EXCEPTION.—Notwithstanding paragraph (1), in accordance with section 128(a) of the Enabling Innovation for Science, Technology, and Energy in America Act of 2014, approval by the Secretary of Energy shall not be required for any technology transfer agreement proposed to be entered into by a National Laboratory of the Department of Energy, the total cost of which (including the National Laboratory contributions and project recipient cost share) is less than $500,000.''; and

(2) in subsection (b), by striking ''subsection (a)(1)'' each place it appears and inserting ''subsection (a)(1)(A)''.

SEC. 129. INCLUSION OF EARLY-STAGE TECHNOLOGY DEMONSTRATION IN AUTHORIZED TECHNOLOGY TRANSFER ACTIVITIES.

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

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

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

''(g) EARLY-STAGE TECHNOLOGY DEMONSTRATION.—The Secretary shall permit the directors of the National Laboratories to use funds allocated for technology transfer within the Department to carry out early-stage

and pre-commercial technology demonstration activities to remove technology barriers that limit private sector interest and demonstrate potential commercial applications of any research and technologies arising from National Laboratory activities intended to meet the Federal Government's research needs.''.

SEC. 130. FUNDING COMPETITIVENESS FOR INSTITUTIONS OF HIGHER EDUCATION AND OTHER NONPROFIT INSTITUTIONS.

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

(1) in paragraph (1), by striking ''Except as provided in paragraphs (2) and (3)'' and inserting ''Except as provided in paragraphs (2), (3), and (4)''; and

(2) by adding at the end the following:

''(4) EXEMPTION FOR INSTITUTIONS OF HIGHER EDUCATION AND OTHER NONPROFIT INSTITUTIONS.—

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

''(B) TERMINATION DATE.—The exemption under subparagraph (A) shall apply during the 6-year period beginning on the date of enactment of this paragraph.''.

SEC. 131. REPORT BY GOVERNMENT ACCOUNTABILITY OFFICE.

Not later than 3 years after the date of enactment of this Act, the Comptroller General of the United States shall submit to Congress a report describing the results of the projects developed under sections 127, 128, and 129, and the amendments made thereby, including information regarding—

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

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

(A) fiscal savings;

(B) expansion of National Laboratory capabilities;

(C) increased efficiency of technology transfers; or

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

SEC. 132. DEFINITIONS.

In this title:

(1) DEPARTMENT.—The term ''Department'' means the Department of Energy.

(2) DIRECTOR.—The term ''Director'' means the Director of the Office of Science.

(3) NATIONAL LABORATORIES.—The term ''National Laboratories'' means Department of Energy nonmilitary national laboratories, including—

(A) Ames Laboratory;

(B) Argonne National Laboratory;

(C) Brookhaven National Laboratory;

(D) Fermi National Accelerator Laboratory;

(E) Idaho National Laboratory;

(F) Lawrence Berkeley National Laboratory;

(G) National Energy Technology Laboratory;

(H) National Renewable Energy Laboratory;

(I) Oak Ridge National Laboratory;

(J) Pacific Northwest National Laboratory;

(K) Princeton Plasma Physics Laboratory;

(L) Savannah River National Laboratory;

(M) Stanford Linear Accelerator Center;

(N) Thomas Jefferson National Accelerator Facility; and

(O) any laboratories operated by the National Nuclear Security Administration, but only with respect to the civilian energy activities thereof.

(4) OFFICE OF SCIENCE.—The term ''Office of Science'' means the Department of Energy Office of Science.

(5) SECRETARY.—The term ''Secretary'' means the Secretary of Energy.

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

(7) UNDER SECRETARY.—The term ''Under Secretary'' means the Under Secretary for Science and Energy.

TITLE II—ONE FUTURE

SEC. 201. SHORT TITLE.

This title may be cited as the ''Our Nation's Energy Future Act of 2014'' or the ''ONE Future Act''.

Subtitle A—Crosscutting Research and Development

SEC. 211. CROSSCUTTING RESEARCH AND DEVELOPMENT.

(a) FINDINGS.—Congress finds the following:

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

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

(b) ADDRESSING OUR NATION'S ENERGY FUTURE ISSUES.—The Secretary shall, through the Under Secretary for Science and Energy, utilize the capabilities of the Department to address issues facing our Nation's energy future, including identifying strategic opportunities for collaborative research, development, demonstration, and commercial application of innovative science and technologies for—

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

(2) improving energy transmission and distribution systems security and resiliency;

(3) utilizing supercritical carbon dioxide in electric power generation;

(4) subsurface engineering;

(5) exascale computing; and

(6) critical challenges identified through comprehensive energy studies, evaluations, and reviews.

(c) CROSSCUTTING APPROACHES.—To the maximum extent practicable, the Secretary shall seek to leverage existing programs, and consolidate and coordinate activities, throughout the Department to promote collaboration and crosscutting approaches within programs.

(d) ADDITIONAL ACTIONS.—The Secretary shall—

(1) prioritize activities that promote the utilization of all affordable domestic resources;

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

(3) develop a rigorous and realistic planning, evaluation, and technical assessment framework for setting objective, long-term strategic goals and evaluating progress that ensures the integrity and independence to insulate planning from political influence and the agility and flexibility to adapt to market dynamics;

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

(5) identify programs that may be more effectively left to the States, industry, nongovernmental

organizations, institutions of higher education, or other stakeholders.

SEC. 212. STRATEGIC RESEARCH PORTFOLIO ANALYSIS AND COORDINATION PLAN.

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

"SEC. 994. STRATEGIC RESEARCH PORTFOLIO ANALYSIS AND COORDINATION PLAN.

''(a) IN GENERAL.—The Secretary shall periodically review all of the science and technology activities of the Department in a strategic framework that takes into account the frontiers of science to which the Department can contribute, the national needs relevant to the Department's statutory missions, and global energy dynamics.

''(b) COORDINATION ANALYSIS AND PLAN.—As part of the review under subsection (a), the Secretary shall develop a coordination plan to improve coordination and collaboration in research, development, demonstration, and commercial application activities across Department organizational boundaries.

''(c) PLAN CONTENTS.—The plan shall describe—

''(1) cross-cutting scientific and technical issues and research questions that span more than one program or major office of the Department;

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

''(3) ways in which the technical interchange within the Department, particularly between the Office of Science and the applied technology programs, can be enhanced, including ways in which the research agendas of the Office of Science and the applied programs can interact and assist each other;

''(4) a description of how the Secretary will ensure that the Department's overall research agenda include, in addition to fundamental, curiosity-driven research, fundamental research related to topics of concern to the applied programs, and applications in Departmental technology programs of research results generated by fundamental, curiosity-driven research;

''(5) critical assessments of any ongoing programs that have experienced sub-par performance or cost over-runs of 10 percent or more over one or more years; and

''(6) activities that may be more effectively left to the States, industry, nongovernmental organizations, institutions of higher education, or other stakeholders.

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

SEC. 213. STRATEGY FOR FACILITIES AND INFRASTRUCTURE.

(a) AMENDMENTS.—Section 993 of the Energy Policy Act of 2005 (42 U.S.C. 16357) is amended—

(1) by amending the section heading to read as follows: ''**STRATEGY FOR FACILITIES AND INFRASTRUCTURE**''; and

(2) in subsection (b)(1), by striking ''2008'' inserting ''2018''.

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

''Sec. 993. Strategy for facilities and infrastructure.''.

SEC. 214. DISTRIBUTED ENERGY AND ELECTRIC ENERGY SYSTEMS.

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

''SEC. 921. DISTRIBUTED ENERGY AND ELECTRIC ENERGY SYSTEMS.

''(a) IN GENERAL.—The Secretary shall carry out programs of research, development, demonstration, and commercial application on distributed energy resources and systems reliability and efficiency, to improve the reliability and efficiency of distributed energy resources and systems, integrating advanced energy technologies with grid connectivity, including activities described in this subtitle. The programs shall address advanced energy technologies and systems and advanced grid security, resiliency, and reliability technologies.

''(b) OBJECTIVES.—To the maximum extent practicable, the Secretary shall seek to—

''(1) leverage existing programs;

''(2) consolidate and coordinate activities throughout the Department to promote collaboration and crosscutting approaches;

''(3) ensure activities are undertaken in a manner that does not duplicate other activities within the Department or other Federal Government activities; and

''(4) identify programs that may be more effectively left to the States, industry, nongovernmental organizations, institutions of higher education, or other stakeholders.''.

SEC. 215. DISTRIBUTED ENERGY TECHNOLOGY COORDINATING CONSORTIA.

(a) AMENDMENTS.—Section 924 of the Energy Policy Act of 2005 (42 U.S.C. 16214) is amended—

(1) by amending the section heading to read as follows: ''**DISTRIBUTED ENERGY TECHNOLOGY COORDINATING CONSORTIA**'';

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

(3) by redesignating paragraph (3) of subsection (b) as paragraph (2).

(b) TABLE OF CONTENTS AMENDMENT.—The item relating to section 924 in the table of contents of the Energy Policy Act of 2005 is amended to read as follows:

''Sec. 924. Distributed energy technology coordinating consortia.''.

SEC. 216. ELECTRIC TRANSMISSION AND DISTRIBUTION RESEARCH AND DEVELOPMENT.

(a) AMENDMENTS.—Section 925 of the Energy Policy Act of 2005 (42 U.S.C. 16215) is amended—

(1) by amending the section heading to read as follows: ''**ELECTRIC TRANSMISSION AND DISTRIBUTION RESEARCH AND DEVELOPMENT**'';

(2) in subsection (a), by inserting ''innovations for'' after ''which shall include'';

(3) in subsection (b)(1), by striking ''this Act'' and inserting ''the ONE Future Act''; and

(4) by amending subsection (c) to read as follows:

''(c) IMPLEMENTATION.—

''(1) CONSORTIUM.—The Secretary shall consider implementing the program under this section using a consortium of participants from industry, institutions of higher education, and National Laboratories.

''(2) OBJECTIVES.—To the maximum extent practicable the Secretary shall seek to—

''(A) leverage existing programs;

''(B) consolidate and coordinate activities, throughout the Department to promote collaboration and crosscutting approaches;

''(C) ensure activities are undertaken in a manner that does not duplicate other activities within the Department or other Federal Government activities; and

''(D) identify programs that may be more effectively left to the States, industry, nongovernmental organizations, institutions of higher education, or other stakeholders.''.

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

''Sec. 925. Electric transmission and distribution research and development.''.

Subtitle B—Nuclear Energy Research and Development

SEC. 221. OBJECTIVES.

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

(1) by amending subsection (a) to read as follows:

''(a) IN GENERAL.—The Secretary shall conduct programs of civilian nuclear energy research, development, demonstration, and commercial application, including activities described in this subtitle. Such programs shall take into consideration the following objectives:

''(1) Enhancing nuclear power's viability as part of the United States energy portfolio.

''(2) Reducing used nuclear fuel and nuclear waste products generated by civilian nuclear energy.

''(3) Supporting technological advances in areas that industry by itself is not likely to undertake because of technical and financial uncertainty.

''(4) Providing the technical means to reduce the likelihood of nuclear proliferation.

''(5) Maintaining a cadre of nuclear scientists and engineers.

''(6) Maintaining National Laboratory and university nuclear programs, including their infrastructure.

''(7) Supporting both individual researchers and multidisciplinary teams of researchers to pioneer new approaches in nuclear energy, science, and technology.

''(8) Developing, planning, constructing, acquiring, and operating special equipment and facilities for the use of researchers.

''(9) Supporting technology transfer and other appropriate activities to assist the nuclear energy industry, and other users of nuclear science and engineering, including activities addressing reliability, availability, productivity, component aging, safety, and security of nuclear power plants.

''(10) Reducing the environmental impact of nuclear energy-related activities.

''(11) Researching and developing technologies and processes to meet Federal and State requirements and standards for nuclear power systems.'';

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

(3) by redesignating subsection (e) as subsection (b).

SEC. 222. PROGRAM OBJECTIVES STUDY.

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

''(c) PROGRAM OBJECTIVES STUDY.—In furtherance of the program objectives listed in subsection (a) of this section, the Government Accountability Office shall, within one year after the date of enactment of this subsection, transmit to the Congress a report on the results of a study on the scientific and technical merit of major Federal and State requirements and standards, including moratoria, that delay or impede the further development and commercialization of nuclear power, and how the Department can assist in overcoming such delays or impediments.''.

SEC. 223. NUCLEAR ENERGY RESEARCH AND DEVELOPMENT PROGRAMS.

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

''(c) REACTOR CONCEPTS.—

''(1) IN GENERAL.—The Secretary shall carry out a program of research, development, demonstration, and commercial application to advance nuclear power systems as well as technologies to sustain currently deployed systems.

''(2) DESIGNS AND TECHNOLOGIES.—In conducting the program under this subsection, the Secretary shall examine advanced reactor designs and nuclear technologies, including those that—

''(A) are economically competitive with other electric power generation plants;

''(B) have higher efficiency, lower cost, and improved safety compared to reactors in operation as of the date of enactment of the ONE Future Act;

''(C) utilize passive safety features;

''(D) minimize proliferation risks;

''(E) substantially reduce production of high-level waste per unit of output;

''(F) increase the life and sustainability of reactor systems currently deployed;

''(G) use improved instrumentation;

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

''(I) minimize water usage or use alternatives to water as a cooling mechanism; or

''(J) use nuclear energy as part of an integrated energy system.

''(3) INTERNATIONAL COOPERATION.—In carrying out the program under this subsection, the

Secretary shall seek opportunities to enhance the progress of the program through international cooperation through such organizations as the Generation IV International Forum or any other international collaboration the Secretary considers appropriate.

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

SEC. 224. SMALL MODULAR REACTOR PROGRAM.

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

''(d) SMALL MODULAR REACTOR PROGRAM.—

''(1) IN GENERAL.—The Secretary shall carry out a small modular reactor program to promote research, development, demonstration, and commercial application of small modular reactors, including through cost-shared projects for commercial application of reactor systems designs.

''(2) CONSULTATION.—The Secretary shall consult with and utilize the expertise of the Secretary of the Navy in establishing and carrying out such program.

''(3) ADDITIONAL ACTIVITIES.—Activities may also include development of advanced computer modeling and simulation tools, by Federal and non-Federal entities, which demonstrate and validate new design capabilities of innovative small modular reactor designs.

''(4) DEFINITION.—For the purposes of this subsection, the term 'small modular reactor' means a nuclear reactor meeting generally accepted industry standards—

''(A) with a rated capacity of less than 300 electrical megawatts;

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

''(C) that can be constructed and operated in combination with similar reactors at a single site.''.

SEC. 225. CONVENTIONAL IMPROVEMENTS TO NUCLEAR POWER PLANTS.

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

''(e) CONVENTIONAL IMPROVEMENTS TO NUCLEAR POWER PLANTS.—

''(1) IN GENERAL.—The Secretary may carry out a Nuclear Energy Research Initiative for research and development related to power conversion improvements to nuclear power plants to promote the research, development, demonstration, and commercial application of—

''(A) cooling systems;

''(B) turbine technologies;

''(C) heat exchangers and pump design;

''(D) special coatings to improve lifetime of components and performance of heat exchangers; and

''(E) advanced power conversion systems for advanced reactor technologies.

''(2) ADMINISTRATION.—The Secretary may undertake initiatives under this subsection only when the goals are relevant and proper to enhance the performance of technologies developed under subsection (c). Not more than $10,000,000 of funds authorized for this section may be used for carrying out this subsection.''.

SEC. 226. FUEL CYCLE RESEARCH AND DEVELOPMENT.

(a) AMENDMENTS.—Section 953 of the Energy Policy Act of 2005 (42 U.S.C. 16273) is amended—

(1) in the section heading by striking ''**ADVANCED FUEL CYCLE INITIATIVE**'' and inserting ''**FUEL CYCLE RESEARCH AND DEVELOPMENT**'';

(2) by striking subsection (a);

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

(4) by inserting before subsection (d), as so redesignated by paragraph (3) of this subsection, the following new subsections:

''(a) IN GENERAL.—The Secretary shall conduct a fuel cycle research, development, demonstration, and commercial application program (referred to in this section as the 'program') on fuel cycle options that improve uranium resource utilization, maximize energy generation, minimize nuclear waste creation, improve safety, mitigate risk of proliferation, and improve waste management in support of a national strategy for spent nuclear fuel and the reactor concepts research, development, demonstration, and commercial application program under section 952(c).

''(b) FUEL CYCLE OPTIONS.—Under this section the Secretary may consider implementing the following initiatives:

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

generation, improve safety performance and margins, and minimize the amount of nuclear waste produced in an open fuel cycle.

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

''(3) ADVANCED STORAGE METHODS.—Developing advanced storage technologies for both onsite and long-term storage that substantially prolong the effective life of current storage devices or that substantially improve upon existing nuclear waste storage technologies and methods, including repositories.

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

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

utilization, reduce proliferation risks, and reduce nuclear waste products.

''(6) OTHER TECHNOLOGIES.—Developing any other technology or initiative that the Secretary determines is likely to advance the objectives of the program.

''(c) ADDITIONAL ADVANCED RECYCLING AND CROSSCUTTING ACTIVITIES.—In addition to and in support of the specific initiatives described in paragraphs (1) through (6) of subsection (b), the Secretary may support the following activities:

''(1) Development and testing of integrated process flow sheets for advanced nuclear fuel recycling processes.

''(2) Research to characterize the byproducts and waste streams resulting from fuel recycling processes.

''(3) Research and development on reactor concepts or transmutation technologies that improve resource utilization or reduce the radiotoxicity of waste streams.

''(4) Research and development on waste treatment processes and separations technologies, advanced waste forms, and quantification of proliferation risks.

''(5) Identification and evaluation of test and experimental facilities necessary to successfully implement the advanced fuel cycle initiative.

''(6) Advancement of fuel cycle-related modeling and simulation capabilities.

''(7) Research to understand the behavior of high-burnup fuels.''.

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

''Sec. 953. Fuel cycle research and development.''.

SEC. 227. NUCLEAR ENERGY ENABLING TECHNOLOGIES PROGRAM.

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

''SEC. 958. NUCLEAR ENERGY ENABLING TECHNOLOGIES.

''(a) IN GENERAL.—The Secretary shall conduct a program to support the integration of activities undertaken through the reactor concepts research, development, demonstration, and commercial application program under section 952(c) and the fuel cycle research and development program under section 953, and support crosscutting nuclear energy concepts. Activities commenced under this section shall be concentrated on broadly applicable research and development focus areas.

''(b) ACTIVITIES.—Activities conducted under this section may include research involving—

''(1) advanced reactor materials;

''(2) advanced radiation mitigation methods;

''(3) advanced proliferation and security risk assessment methods;

''(4) advanced sensors and instrumentation;

''(5) advanced nuclear manufacturing methods;

''(6) high performance computation modeling, including multiphysics, multidimensional modeling and simulation for nuclear energy systems; and

''(7) any crosscutting technology or transformative concept aimed at establishing substantial and revolutionary enhancements in the performance of future nuclear energy systems that the Secretary considers relevant and appropriate to the purpose of this section.

''(c) REPORT.—The Secretary shall submit, as part of the annual budget submission of the Department, a report on the activities of the program conducted under this section, which shall include a brief evaluation of each activity's progress.''.

(b) CONFORMING AMENDMENT.—The table of contents of the Energy Policy Act of 2005 is amended by

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

''Sec. 958. Nuclear energy enabling technologies.''.

SEC. 228. TECHNICAL STANDARDS COLLABORATION.

(a) IN GENERAL.—The Director of the National Institute of Standards and Technology shall establish a nuclear energy standards committee (in this section referred to as the ''technical standards committee'') to facilitate and support, consistent with the National Technology Transfer and Advancement Act of 1995, the development or revision of technical standards for new and existing nuclear power plants and advanced nuclear technologies.

(b) MEMBERSHIP.—

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

(2) CO-CHAIRS.—The technical standards committee shall be co-chaired by a representative from the National Institute of Standards and Technology and a representative from a private sector standards organization.

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

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

(2) formulate, coordinate, and recommend priorities for the development of new technical standards and the revision of existing technical standards to address the needs identified under paragraph (1);

(3) facilitate and support collaboration and cooperation among standards developers to address the needs and priorities identified under paragraphs (1) and (2);

(4) as appropriate, coordinate with other national, regional, or international efforts on nuclear energy-related technical standards in order to avoid conflict and duplication and to ensure global compatibility; and

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

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

Standards and Technology for activities under this section.

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

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

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

SEC. 230. AVAILABLE FACILITIES DATABASE.

The Secretary shall prepare a database of non-Federal user facilities receiving Federal funds that may be used for unclassified nuclear energy research. The Secretary shall make this database accessible on the Department's website.

SEC. 231. NUCLEAR WASTE DISPOSAL.

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

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

Subtitle C—Energy Efficiency and Renewable Energy Research and Development

SEC. 241. ENERGY EFFICIENCY.

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

"SEC. 911. ENERGY EFFICIENCY.

''(a) OBJECTIVES.—The Secretary shall conduct programs of energy efficiency research, development, demonstration, and commercial application, including activities described in this subtitle. Such programs shall prioritize activities that industry by itself is not likely to undertake because of technical, financial, or regulatory uncertainty, and take into consideration the following objectives:

''(1) Increasing energy efficiency.

''(2) Reducing the cost of energy and making the economy more competitive.

''(3) Improving the energy security of the United States.

''(4) Reducing the environmental impact of energy-related activities.

''(b) PROGRAMS.—Programs under this subtitle shall include research, development, demonstration, and commercial application of—

''(1) innovative, affordable technologies to improve the energy efficiency and environmental performance of vehicles, including weight and drag reduction technologies, and whole-vehicle design optimization;

''(2) cost-effective technologies, for new construction and retrofit, to improve the energy efficiency and environmental performance of buildings, using a whole-buildings approach;

''(3) advanced technologies to improve the energy efficiency, environmental performance, and process efficiency of energy-intensive and waste-intensive industries; and

''(4) technologies to improve the energy efficiency of appliances and mechanical systems for buildings in extreme climates, including cogeneration, trigeneration, and polygeneration units and increased use of renewable resources, or alternative fuels.''.

SEC. 242. NEXT GENERATION LIGHTING INITIATIVE.

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

SEC. 243. BUILDING STANDARDS.

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

SEC. 244. SECONDARY ELECTRIC VEHICLE BATTERY USE PROGRAM.

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

SEC. 245. ENERGY EFFICIENCY SCIENCE INITIATIVE.

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

''(a) ESTABLISHMENT.—The Secretary shall establish an Energy Efficiency Science Initiative to be managed by the Under Secretary for Science and Energy, for grants to be competitively awarded and subject to peer review for research relating to energy efficiency innovations.''.

SEC. 246. ADVANCED ENERGY TECHNOLOGY TRANSFER CENTERS.

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

(1) in subsection (a)—

(A) by inserting ''and'' at the end of paragraph (2)(B);

(B) by striking ''; and'' at the end of paragraph (3) and inserting a period; and

(C) by striking paragraph (4);

(2) in subsection (b)—

(A) by striking paragraph (1);

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

(C) by striking paragraph (6);

(3) by amending subsection (g) to read as follows:

''(g) PROHIBITION.—None of the funds awarded under this section may be used for the construction of facilities or the deployment of commercially available technologies.''; and

(4) by striking subsection (i).

SEC. 247. RENEWABLE ENERGY.

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

''SEC. 931. RENEWABLE ENERGY.

''(a) IN GENERAL.—

''(1) OBJECTIVES.—The Secretary shall conduct programs of renewable energy research, development, demonstration, and commercial application, including activities described in this subtitle. Such programs shall prioritize activities that industry by itself is not likely to undertake because of technical, financial, or regulatory uncertainty, and take into consideration the following objectives:

''(A) Increasing the conversion efficiency of all forms of renewable energy through improved technologies.

''(B) Decreasing the cost of renewable energy generation and delivery.

''(C) Promoting the diversity of the energy supply.

''(D) Decreasing the dependence of the United States on foreign mineral resources.

''(E) Improving United States energy security.

''(F) Decreasing the environmental impact of renewable energy-related activities.

''(G) Increasing the export of renewable generation technologies from the United States.

''(2) PROGRAMS.—

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

''(i) photovoltaics;

''(ii) solar heating;

''(iii) concentrating solar power;

''(iv) lighting systems that integrate sunlight and electrical lighting in complement to each other;

''(v) manufacturability of low cost, high quality solar systems; and

''(vi) development of technologies that can be easily integrated into new and existing buildings.

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

''(i) low speed wind energy;

''(ii) testing and verification technologies;

''(iii) distributed wind energy generation; and

''(iv) transformational technologies for harnessing wind energy.

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

technologies for reducing the costs of geothermal energy, including technologies for—

"(i) improving detection of geothermal resources;

"(ii) decreasing drilling costs;

"(iii) decreasing maintenance costs through improved materials;

"(iv) increasing the potential for other revenue sources, such as mineral production; and

"(v) increasing the understanding of reservoir life cycle and management.

"(D) HYDROPOWER.—The Secretary shall conduct a program of research, development, demonstration, and commercial application for cost competitive technologies that enable the development of new and incremental hydropower capacity, adding to the diversity of the energy supply of the United States, including:

"(i) Advanced technologies to enhance environmental performance and yield greater energy efficiencies.

"(ii) Ocean energy, including wave energy.

''(E) MISCELLANEOUS PROJECTS.—The Secretary shall conduct research, development, demonstration, and commercial application programs for—

''(i) the combined use of renewable energy technologies with one another and with other energy technologies, including the combined use of renewable power and fossil technologies;

''(ii) renewable energy technologies for cogeneration of hydrogen and electricity;

''(iii) kinetic hydro turbines; and

''(iv) the Pioneering Energy Research Program under section 262 of the ONE Future Act.

''(b) RURAL DEMONSTRATION PROJECTS.—In carrying out this section, the Secretary, in consultation with the Secretary of Agriculture, shall give priority to demonstrations that assist in delivering electricity to rural and remote locations including—

''(1) advanced renewable power technology, including combined use with fossil technologies;

''(2) biomass; and

''(3) geothermal energy systems.

''(c) ANALYSIS AND EVALUATION.—

''(1) IN GENERAL.—The Secretary shall conduct analysis and evaluation in support of the renewable energy programs under this subtitle. These activities shall be used to guide budget and program decisions, and shall include—

''(A) economic and technical analysis of renewable energy potential, including resource assessment;

''(B) analysis of past program performance, both in terms of technical advances and in market introduction of renewable energy;

''(C) assessment of domestic and international market drivers, including the impacts of any Federal, State, or local grants, loans, loan guarantees, tax incentives, statutory or regulatory requirements, or other government initiatives; and

''(D) any other analysis or evaluation that the Secretary considers appropriate.

''(2) FUNDING.—The Secretary may designate up to 1 percent of the funds appropriated for carrying out this subtitle for analysis and evaluation activities under this subsection.

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

on Science, Space, and Technology of the House of Representatives and the Committee on Energy and Natural Resources of the Senate at least 30 days before each annual budget request is submitted to Congress.''.

SEC. 248. BIOENERGY PROGRAM.

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

''SEC. 932. BIOENERGY PROGRAM.

''(a) PROGRAM.—The Secretary shall conduct a program of research, development, demonstration, and commercial application for bioenergy, including innovations in—

''(1) biopower energy systems;

''(2) biofuels;

''(3) bioproducts;

''(4) integrated biorefineries that may produce biopower, biofuels, and bioproducts; and

''(5) cross-cutting research and development in feedstocks.

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

''(1) advanced biochemical and thermochemical conversion technologies capable of making fuels from lignocellulosic feedstocks that are price-competitive with fossil-based fuels and fully compatible with either internal combustion engines or fuel cell-powered vehicles;

''(2) advanced biotechnology processes capable of making biofuels and bioproducts with emphasis on development of biorefinery technologies using enzyme-based processing systems; and

''(3) other advanced processes that will enable the development of cost-effective bioproducts, including biofuels.

''(d) RETROFIT TECHNOLOGIES FOR THE DEVELOPMENT OF ETHANOL FROM CELLULOSIC MATERIALS.—The Secretary shall establish a program of research, development, demonstration, and commercial application for technologies and processes to enable biorefineries that exclusively use corn grain or corn starch as a feedstock to produce ethanol to be retrofitted to accept a range of biomass, including lignocellulosic feedstocks.

''(e) DEFINITIONS.—In this section:

''(1) BIOMASS.—The term 'biomass' means—

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

''(B) any organic byproduct of agriculture (including wastes from food production and processing) that can be converted into energy; or

''(C) any waste material that can be converted to energy, is segregated from other waste materials, and is derived from—

''(i) any of the following forest-related resources: mill residues, precommercial thinnings, slash, brush, or otherwise nonmerchantable material;

''(ii) wood waste materials, including waste pallets, crates, dunnage, manufacturing and construction wood wastes (other than pressure-treated, chemically treated, or painted wood wastes), and landscape or right-of-way tree trimmings, but not including municipal solid waste, gas derived from the biodegradation of municipal solid waste, or paper that is commonly recycled; or

''(iii) solids derived from waste water treatment processes.

''(2) LIGNOCELLULOSIC FEEDSTOCK.—The term 'lignocellulosic feedstock' means any portion of

a plant or coproduct from conversion, including crops, trees, forest residues, and agricultural residues not specifically grown for food, including from barley grain, grapeseed, rice bran, rice hulls, rice straw, soybean matter, and sugarcane bagasse.''.

SEC. 249. CONCENTRATING SOLAR POWER RESEARCH PROGRAM.

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

SEC. 250. RENEWABLE ENERGY IN PUBLIC BUILDINGS.

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

Subtitle D—Fossil Energy Research and Development

SEC. 261. FOSSIL ENERGY.

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

''SEC. 961. FOSSIL ENERGY.

''(a) IN GENERAL.—The Secretary shall carry out research, development, demonstration, and commercial application programs in fossil energy, including activities under this subtitle, with the goal of improving the efficiency, effectiveness, and environmental performance of fossil energy production, upgrading, conversion, and con-

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

''(1) Increasing the energy conversion efficiency of all forms of fossil energy through improved technologies.

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

''(3) Promoting diversity of energy supply.

''(4) Decreasing the dependence of the United States on foreign energy supplies.

''(5) Improving United States energy security.

''(6) Decreasing the environmental impact of energy-related activities.

''(7) Increasing the export of fossil energy-related equipment, technology, and services from the United States.

''(b) LIMITATIONS.—

''(1) USES.—None of the funds authorized for carrying out this section may be used for Fossil Energy Environmental Restoration.

''(2) INSTITUTIONS OF HIGHER EDUCATION.—Not less than 20 percent of the funds appropriated for carrying out section 964 of this Act for each fiscal year shall be dedicated to research and development carried out at institutions of higher education.

''(3) USE FOR REGULATORY ASSESSMENTS OR DETERMINATIONS.—The results of any research, development, demonstration, or commercial application projects or activities of the Department may not be used for regulatory assessments or determinations by Federal regulatory authorities.

''(c) ASSESSMENTS.—

''(1) CONSTRAINTS AGAINST BRINGING RESOURCES TO MARKET.—Not later than 1 year after the date of enactment of the ONE Future Act, the Secretary shall transmit to Congress an assessment of the technical, institutional, policy, and regulatory constraints to bringing new domestic fossil resources to market.

''(2) TECHNOLOGY CAPABILITIES.—Not later than 2 years after the date of enactment of the ONE Future Act, the Secretary shall transmit to Congress a long-term assessment of existing and projected technological capabilities for expanded production from domestic unconventional oil, gas, and methane reserves.''.

SEC. 262. PIONEERING ENERGY RESEARCH.

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

ship Pioneering Energy Research Program for research, development, demonstration, and commercial application of technologies to maximize domestic energy production, improve environmental stewardship, ensure domestic energy security, and maintain global energy leadership.

(b) COVERED ACTIVITIES.—The program under this section shall include research, development, demonstration, and commercial application on—

(1) natural gas and other petroleum resource exploration, production and consumption, including technologies and processes to improve well and pipeline integrity, improve understanding of fluid flow and storage, reduce surface footprints, and improve water management technologies in conventional and unconventional resources;

(2) alternative liquid transportation fuel activities, including integration of biomass and natural gas for transportation fuels production, cleaner fuels, renewable liquid fuels other than ethanol, natural gas vehicles, and other innovative fossil-based fuels;

(3) energy system risk management, optimization, resiliency, and integration;

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

of one or more Hydraulic Fracturing Test Sites to address efficiency, safety, and environmental sustainability of hydraulic fracturing and shale petroleum technologies;

(5) small producer technology challenges, including improving well integrity and efficiency;

(6) subsurface energy exploration and production, including geothermal energy;

(7) interstate and intrastate natural gas pipeline and distribution system integrity management; and

(8) other domestic energy challenges as identified by the Secretary or the program consortium and included in the annual plan prepared under subsection (i).

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

(d) SELECTION OF THE PROGRAM CONSORTIUM.—

(1) IN GENERAL.—Not later than 180 days after the date of enactment of this Act, the Secretary shall select the program consortium through an open, competitive process.

(2) REQUIREMENT OF SECTION 501(c)(3) STATUS.—The Secretary shall not select a program consortium under this section unless such consortium is an organization described in section 501(c)(3) of the Internal Revenue Code of 1986 and exempt from tax under such section 501(a) of such Code.

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

(1) administer the program, to the extent provided under subsection (c);

(2) issue research project solicitations;

(3) make project awards to research performers;

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

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

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

(g) COORDINATION.—In carrying out this section, the Secretary and the program consortium shall promote coordination and cooperation among program offices at the Department.

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

(i) ANNUAL PLAN.—

(1) DEVELOPMENT.—Not later than 1 year after the date of enactment of this Act, and annually thereafter, the program consortium shall develop, and transmit to the Secretary, the Committee on Science, Space, and Technology of the House of Representatives, and the Committee on Energy and Natural Resources of the Senate, a plan for activities under this section, including the distribution of Program funds, which shall be reviewed and approved within 60 days by the Secretary.

(2) CONTENTS.—The annual plan shall describe the ongoing and prospective activities of the program under this section and shall include a list of any solicitations for awards to carry out research, development, demonstration, and commercial application activities, including specifics on the topics for such work, who would be eligible to apply, selection criteria, and the duration of awards.

(j) AWARDS.—

(1) IN GENERAL.—Upon approval of the Secretary, the program consortium shall make awards to research performers to carry out research, development, demonstration, and commercial application activities under this section.

(2) OVERSIGHT.—

(A) IN GENERAL.—The program consortium shall oversee the implementation of awards under this subsection, consistent with the annual plan developed under subsection (i), including disbursing funds and monitoring activities carried out under such awards for compliance with the terms and conditions of the awards.

(B) EFFECT.—Nothing in subparagraph (A) shall limit the authority or responsibility of

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

(k) AUTHORIZATION OF APPROPRIATIONS.—There are authorized to be appropriated to the Secretary, to remain available until expended, for carrying out this section—

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

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

SEC. 263. RESEARCH, DEVELOPMENT, DEMONSTRATION, AND COMMERCIAL APPLICATION PROGRAMS.

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

(1) in subsection (a)—

(A) in paragraph (10), by striking ''and'' at the end;

(B) in paragraph (11), by striking the period at the end and inserting a semicolon; and

(C) by adding at the end the following:

''(12) specific additional programs to address water use and reuse;

''(13) the testing, including the construction of testing facilities, of high temperature materials for

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

''(14) innovations to application of existing coal conversion systems designed to increase efficiency of conversion, flexibility of operation, and other modifications to address existing usage requirements.'';

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

(3) by inserting after subsection (a) the following:

''(b) TRANSFORMATIONAL COAL TECHNOLOGY PROGRAM.—

''(1) IN GENERAL.—As part of the program established under subsection (a), the Secretary may carry out a program designed to undertake research, development, demonstration, and commercial application of technologies, including the accelerated development of—

''(A) chemical looping technology;

''(B) supercritical carbon dioxide power generation cycles;

''(C) pressurized oxycombustion, including new and retrofit technologies; and

''(D) other technologies that are characterized by the use of—

''(i) alternative energy cycles;

''(ii) thermionic devices using waste heat;

''(iii) fuel cells;

''(iv) replacement of chemical processes with biotechnology;

''(v) nanotechnology;

''(vi) new materials in applications (other than extending cycles to higher temperature and pressure), such as membranes or ceramics;

''(vii) carbon utilization, such as in construction materials, using low quality energy to reconvert back to a fuel, or manufactured food;

''(viii) advanced gas separation concepts; and

''(ix) other technologies, including—

''(I) modular, manufactured components; and

''(II) innovative production or research techniques, such as using 3–D printer systems, for the production of early research and development prototypes.

''(2) COST SHARE.—In carrying out the program described in paragraph (1), the Secretary shall enter into partnerships with private entities to share the costs of carrying out the program. The Secretary may reduce or eliminate the non-Federal cost share requirement if the Secretary determines that the reduction or elimination is necessary and appropriate considering the technological risks involved in the project.''; and

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

(A) by striking paragraph (1) and inserting the following:

''(1) IN GENERAL.—In carrying out programs authorized by this section, the Secretary shall identify cost and performance goals for coal-based technologies that would permit the continued cost-competitive use of coal for the production of electricity, chemical feedstocks, transportation fuels, and other marketable products.''; and

(B) in paragraph (2), by striking ''date of enactment of this Act'' each place it appears and inserting ''date of enactment of the ONE Future Act''.

(b) ADVISORY COMMITTEE; AUTHORIZATION OF APPROPRIATIONS.—Section 963 of the Energy Policy Act of 2005 (42 U.S.C. 16293) is amended—

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

''(6) ADVISORY COMMITTEE.—

''(A) IN GENERAL.—Subject to subparagraph (B), the Secretary shall establish an advisory committee to undertake, not less frequently than once every 3 years, a review and prepare a report on the progress being made by the Department of Energy to achieve the goals described in subsections (a) and (b) of section 962 and subsection (b) of this section.

''(B) MEMBERSHIP REQUIREMENTS.—Members of the advisory committee established under subparagraph (A) shall be appointed by the Secretary.''; and

(2) by amending subsection (d) to read as follows:

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

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

SEC. 264. HIGH EFFICIENCY GAS TURBINES RESEARCH AND DEVELOPMENT.

(a) IN GENERAL.—The Secretary, through the Office of Fossil Energy, shall carry out a multiyear, multiphase program of research, development, demonstration, and commercial application to innovate technologies to maximize the efficiency of gas turbines used in power generation systems.

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

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

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

(B) improved heat transfer capability;

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

(D) combustion technology to produce higher firing temperature while lowering nitrogen oxide and carbon monoxide emissions per unit of output;

(E) advanced controls and systems integration;

(F) advanced high performance compressor technology; and

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

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

(3) include field demonstrations of the developed technology elements so as to demonstrate technical and economic feasibility; and

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

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

(1) in phase I—

(A) to develop the conceptual design of advanced high efficiency gas turbines that can achieve at least 62 percent combined cycle efficiency or 47 percent simple cycle efficiency on a lower heating value basis; and

(B) to develop and demonstrate the technology required for advanced high efficiency gas turbines that can achieve at least 62 percent

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

(2) in phase II, to develop the conceptual design for advanced high efficiency gas turbines that can achieve at least 65 percent combined cycle efficiency or 50 percent simple cycle efficiency on a lower heating value basis.

(d) PROPOSALS.—Within 180 days after the date of enactment of this Act, the Secretary shall solicit grant and contract proposals from industry, small businesses, universities, and other appropriate parties for conducting activities under this section. In selecting proposals, the Secretary shall emphasize—

(1) the extent to which the proposal will stimulate the creation or increased retention of jobs in the United States; and

(2) the extent to which the proposal will promote and enhance United States technology leadership.

(e) COMPETITIVE AWARDS.—The provision of funding under this section shall be on a competitive basis with an emphasis on technical merit.

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

Subtitle E—Advanced Research Projects Agency–Energy

SEC. 281. ARPA–E AMENDMENTS.

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

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

''(1) IN GENERAL.—The goals of ARPA–E shall be to enhance the economic and energy security of the United States and to ensure that the United States maintains a technological lead through the development of advanced energy technologies.'';

(2) in subsection (i)(1), by inserting ''ARPA–E shall not provide funding for a project unless the prospective grantee demonstrates sufficient attempts to secure private financing as to indicate that the project is not independently commercially viable.'' after ''relevant research agencies.'';

(3) in subsection (l)(1), by inserting ''and once every 6 years thereafter,'' after ''operation for 6 years,''; and

(4) by redesignating subsection (n) as subsection (o) and inserting after subsection (m) the following new subsection:

''(n) PROTECTION OF PROPRIETARY INFORMATION.—

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

''(A) Plans for commercialization of technologies developed under the award, including business plans, technology to market plans, market studies, and cost and performance models.

''(B) Investments provided to an awardee from third parties, such as venture capital, hedge fund, or private equity firms, including amounts and percentage of ownership of the awardee provided in return for such investments.

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

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

''(D) Revenue from the licensing or sale of new products or services resulting from the research conducted under the award.

''(2) EFFECT OF SUBSECTION.—Nothing in this subsection affects—

''(A) the authority of the Secretary to use information without publicly disclosing such information; or

''(B) the responsibility of the Secretary to transmit information to Congress as required by law.''.

Subtitle F—Miscellaneous

SEC. 291. AUTHORIZATION OF APPROPRIATIONS.

(a) CROSSCUTTING PROGRAMS.—There are authorized to be appropriated to the Secretary for—

(1) research, development, demonstration, and commercial application for Electrical Delivery and Energy Reliability Research and Development activities within the Office of Electricity, $105,700,000 for fiscal year 2014; and

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

2015, including up to $105,700,000 for Electrical Delivery and Energy Reliability Research and Development activities within the Office of Electricity.

(b) NUCLEAR ENERGY.—

(1) IN GENERAL.—There are authorized to be appropriated to the Secretary for research, development, demonstration, and commercial application for nuclear energy technology activities within the Office of Nuclear Energy $488,630,000 for each of fiscal years 2014 and 2015.

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

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

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

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

(d) FOSSIL ENERGY.—There are authorized to be appropriated to the Secretary for research, development, demonstration, and commercial application for fossil energy technology activities within the Office of Fossil Energy $561,931,000 for each of fiscal years 2014 and 2015.

(e) ARPA–E.—There are authorized to be appropriated to the Secretary for the Advanced Research Projects Agency–Energy—

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

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

SEC. 292. DEFINITIONS.

In this title—

(1) the term ''Department'' means the Department of Energy; and

(2) the term ''Secretary'' means the Secretary of Energy.

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