

Energy Independence and Security Act of 2007

[Public Law 110–140]

[As Amended Through P.L. 118–188, Enacted December 23, 2024]

【Currency: This publication is a compilation of the text of Public Law 110–140. It was last amended by the public law listed in the As Amended Through note above and below at the bottom of each page of the pdf version and reflects current law through the date of the enactment of the public law listed at <https://www.govinfo.gov/app/collection/comps/>】

【Note: While this publication does not represent an official version of any Federal statute, substantial efforts have been made to ensure the accuracy of its contents. The official version of Federal law is found in the United States Statutes at Large and in the United States Code. The legal effect to be given to the Statutes at Large and the United States Code is established by statute (1 U.S.C. 112, 204).】

AN ACT To move the United States toward greater energy independence and security, to increase the production of clean renewable fuels, to protect consumers, to increase the efficiency of products, buildings, and vehicles, to promote research on and deploy greenhouse gas capture and storage options, and to improve the energy performance of the Federal Government, and for other purposes.

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

SECTION 1. SHORT TITLE; TABLE OF CONTENTS

(a) SHORT TITLE.—This Act may be cited as the “Energy Independence and Security Act of 2007”.

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

- Sec. 1. Short title; table of contents.
- Sec. 2. Definitions.
- Sec. 3. Relationship to other law.

TITLE I—ENERGY SECURITY THROUGH IMPROVED VEHICLE FUEL ECONOMY

Subtitle A—Increased Corporate Average Fuel Economy Standards

- Sec. 101. Short title.
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- Sec. 103. Definitions.
- Sec. 104. Credit trading program.
- Sec. 105. Consumer information.
- Sec. 106. Continued applicability of existing standards.
- Sec. 107. National Academy of Sciences studies.
- Sec. 108. National Academy of Sciences study of medium-duty and heavy-duty truck fuel economy.
- Sec. 109. Extension of flexible fuel vehicle credit program.
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- Sec. 133. Inclusion of electric drive in Energy Policy Act of 1992.
- Sec. 134. Loan guarantees for fuel-efficient automobile parts manufacturers.
- Sec. 135. Advanced battery loan guarantee program.
- Sec. 136. Advanced technology vehicles manufacturing incentive program.
- Sec. 137. Research and development into integrating electric vehicles onto the electric grid.

Subtitle C—Federal Vehicle Fleets

- Sec. 141. Federal vehicle fleets.
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- Sec. 204. Environmental and resource conservation impacts.
- Sec. 205. Biomass based diesel and biodiesel labeling.
- Sec. 206. Study of credits for use of renewable electricity in electric vehicles.
- Sec. 207. Grants for production of advanced biofuels.
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Subtitle B—Biofuels Research and Development

- Sec. 221. Biodiesel.
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- Sec. 223. Grants for biofuel production research and development in certain States.
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- Sec. 230. Cellulosic ethanol and biofuels research.
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- Sec. 232. Environmental research and development.
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¹The item relating to section 914 in the table of sections was not amended to reflect the pending change to the section heading per section 1470(v)(1)(A) of division F of Public Law 115–254. For the effective date of such amendment, see note set out in the second version of section 914.

²Section 10622 of division B of Public Law 117–167 adds at the end of subtitle C of title IX a new section 936, however, there was no conforming change to add an item relating to such section to the table of contents.

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Sec. 1500. Amendment of 1986 Code.

³Section 402(a) of division BB of Public Law 117–328 amended to read section 1405 in its entirety. There was no conforming change to the item relating to such section in the table of contents in section 1(b) of this Act.

⁴Section 403 of division BB of Public Law 117–328 amended to read section 1407 in its entirety. There was no conforming change to the item relating to such section in the table of contents in section 1(b) of this Act

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Sec. 1501. Extension of additional 0.2 percent FUTA surtax.

Sec. 1502. 7-year amortization of geological and geophysical expenditures for certain major integrated oil companies.

TITLE XVI—EFFECTIVE DATE

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**TITLE I—ENERGY SECURITY THROUGH
IMPROVED VEHICLE FUEL ECONOMY**

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Subtitle B—Improved Vehicle Technology

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SEC. 135. [42 U.S.C. 17012] ADVANCED BATTERY LOAN GUARANTEE PROGRAM

(a) **ESTABLISHMENT OF PROGRAM.**—The Secretary shall establish a program to provide guarantees of loans by private institutions for the construction of facilities for the manufacture of advanced vehicle batteries and battery systems that are developed and produced in the United States, including advanced lithium ion batteries and hybrid electrical system and component manufacturers and software designers.

(b) **REQUIREMENTS.**—The Secretary may provide a loan guarantee under subsection (a) to an applicant if—

(1) without a loan guarantee, credit is not available to the applicant under reasonable terms or conditions sufficient to finance the construction of a facility described in subsection (a);

(2) the prospective earning power of the applicant and the character and value of the security pledged provide a reasonable assurance of repayment of the loan to be guaranteed in accordance with the terms of the loan; and

(3) the loan bears interest at a rate determined by the Secretary to be reasonable, taking into account the current average yield on outstanding obligations of the United States with remaining periods of maturity comparable to the maturity of the loan.

(c) **CRITERIA.**—In selecting recipients of loan guarantees from among applicants, the Secretary shall give preference to proposals that—

(1) meet all applicable Federal and State permitting requirements;

(2) are most likely to be successful; and

(3) are located in local markets that have the greatest need for the facility.

(d) **MATURITY.**—A loan guaranteed under subsection (a) shall have a maturity of not more than 20 years.

(e) **TERMS AND CONDITIONS.**—The loan agreement for a loan guaranteed under subsection (a) shall provide that no provision of the loan agreement may be amended or waived without the consent of the Secretary.

(f) **ASSURANCE OF REPAYMENT.**—The Secretary shall require that an applicant for a loan guarantee under subsection (a) provide an assurance of repayment in the form of a performance bond, insurance, collateral, or other means acceptable to the Secretary in an amount equal to not less than 20 percent of the amount of the loan.

(g) **GUARANTEE FEE.**—The recipient of a loan guarantee under subsection (a) shall pay the Secretary an amount determined by the Secretary to be sufficient to cover the administrative costs of the Secretary relating to the loan guarantee.

(h) **FULL FAITH AND CREDIT.**—The full faith and credit of the United States is pledged to the payment of all guarantees made under this section. Any such guarantee made by the Secretary shall be conclusive evidence of the eligibility of the loan for the guarantee with respect to principal and interest. The validity of the guarantee shall be incontestable in the hands of a holder of the guaranteed loan.

(i) **REPORTS.**—Until each guaranteed loan under this section has been repaid in full, the Secretary shall annually submit to Congress a report on the activities of the Secretary under this section.

(j) **AUTHORIZATION OF APPROPRIATIONS.**—There are authorized to be appropriated such sums as are necessary to carry out this section.

(k) **TERMINATION OF AUTHORITY.**—The authority of the Secretary to issue a loan guarantee under subsection (a) terminates on the date that is 10 years after the date of enactment of this Act.

SEC. 136. [42 U.S.C. 17013] ADVANCED TECHNOLOGY VEHICLES MANUFACTURING INCENTIVE PROGRAM.

(a) **DEFINITIONS.**—In this section:

(1) **ADVANCED TECHNOLOGY VEHICLE.**—The term “advanced technology vehicle” means—

(A) an ultra efficient vehicle or a light duty vehicle that meets⁵

(i) the Bin 5 Tier II emission standard established in regulations issued by the Administrator of the Environmental Protection Agency under section 202(i) of the Clean Air Act (42 U.S.C. 7521(i)), or a lower-numbered Bin emission standard;

(ii) any new emission standard in effect for fine particulate matter prescribed by the Administrator under that Act (42 U.S.C. 7401 et seq.); and

(iii) at least 125 percent of the average base year combined fuel economy for vehicles with substantially similar attributes;

(B) a medium duty vehicle or a heavy duty vehicle that exceeds 125 percent of the greenhouse gas emissions and fuel efficiency standards established by the final rule of the Environmental Protection Agency entitled “Greenhouse Gas Emissions and Fuel Efficiency Standards for Medium- and Heavy-Duty Engines and Vehicles—Phase 2” (81 Fed. Reg. 73478 (October 25, 2016));

⁵ So in law. An em dash should appear at the end of the matter preceding clause (i) of subparagraph (A).

- (C) a train or locomotive;
- (D) a maritime vessel;
- (E) an aircraft; and
- (F) hyperloop technology.

(2) COMBINED FUEL ECONOMY.—The term “combined fuel economy” means—

(A) the combined city/highway miles per gallon values, as reported in accordance with section 32904 of title 49, United States Code; and

(B) in the case of an electric drive vehicle with the ability to recharge from an off-board source, the reported mileage, as determined in a manner consistent with the Society of Automotive Engineers recommended practice for that configuration or a similar practice recommended by the Secretary.

(3) ENGINEERING INTEGRATION COSTS.—The term “engineering integration costs” includes the cost of engineering tasks relating to—

(A) incorporating qualifying components into the design of advanced technology vehicles; and

(B) designing tooling and equipment and developing manufacturing processes and material suppliers for production facilities that produce qualifying components or advanced technology vehicles.

(4) QUALIFYING COMPONENTS.—The term “qualifying components” means components that the Secretary determines to be—

(A) designed for advanced technology vehicles; and

(B) installed for the purpose of meeting the performance requirements of advanced technology vehicles.

(5) ULTRA EFFICIENT VEHICLE.—The term “ultra efficient vehicle” means a fully closed compartment vehicle designed to carry at least 2 adult passengers that achieves—

(A) at least 75 miles per gallon while operating on gasoline or diesel fuel;

(B) at least 75 miles per gallon equivalent while operating as a hybrid electric-gasoline or electric-diesel vehicle; or

(C) at least 75 miles per gallon equivalent while operating as a fully electric vehicle.

(b) ADVANCED VEHICLES MANUFACTURING FACILITY.—The Secretary shall provide facility funding awards under this section to automobile manufacturers, ultra efficient vehicle manufacturers, advanced technology vehicle manufacturers, and component suppliers to pay not more than 30 percent of the cost of—

(1) reequipping, expanding, or establishing a manufacturing facility in the United States to produce—

(A) qualifying advanced technology vehicles;

(B) qualifying components; or

(C) ultra efficient vehicles; and

(2) engineering integration performed in the United States of qualifying vehicles, ultra efficient vehicles, and qualifying components.

(c) PERIOD OF AVAILABILITY.—An award under subsection (b) shall apply to—

(1) facilities and equipment placed in service before December 30, 2020; and

(2) engineering integration costs incurred during the period beginning on the date of enactment of this Act and ending on December 30, 2020.

(d) DIRECT LOAN PROGRAM.—

(1) IN GENERAL.—Not later than 1 year after the date of enactment of this Act, and subject to the availability of appropriated funds, the Secretary shall carry out a program to provide loans to eligible individuals and entities (as determined by the Secretary) for the costs of activities described in subsection (b). The loans shall be made through the Federal Financing Bank, with the full faith and credit of the United States Government on the principal and interest. The full credit subsidy shall be paid by the Secretary using appropriated funds.

(2) APPLICATION.—An applicant for a loan under this subsection shall submit to the Secretary an application at such time, in such manner, and containing such information as the Secretary may require, including a written assurance that—

(A) all laborers and mechanics employed by contractors or subcontractors during construction, alteration, or repair that is financed, in whole or in part, by a loan under this section shall be paid wages at rates not less than those prevailing on similar construction in the locality, as determined by the Secretary of Labor in accordance with sections 3141-3144, 3146, and 3147 of title 40, United States Code; and

(B) the Secretary of Labor shall, with respect to the labor standards described in this paragraph, have the authority and functions set forth in Reorganization Plan Numbered 14 of 1950 (5 U.S.C. App.) and section 3145 of title 40, United States Code.

(3) SELECTION OF ELIGIBLE PROJECTS.—

(A) IN GENERAL.—The Secretary shall select eligible projects to receive loans under this subsection if the Secretary determines that—

(i) the loan recipient—

(I) has a reasonable prospect of repaying the principal and interest on the loan;

(II) will provide sufficient information to the Secretary for the Secretary to ensure that the qualified investment is expended efficiently and effectively; and

(III) has met such other criteria as may be established and published by the Secretary; and

(ii) the amount of the loan (when combined with amounts available to the loan recipient from other sources) will be sufficient to carry out the project.

(B) REASONABLE PROSPECT OF REPAYMENT.—The Secretary shall base a determination of whether there is a reasonable prospect of repayment of the principal and interest on a loan under subparagraph (A)(i)(I) on a com-

prehensive evaluation of whether the loan recipient has a reasonable prospect of repaying the principal and interest, including, as applicable, an evaluation of—

(i) the strength of the contractual terms of the eligible project (if commercially reasonably available);

(ii) the forecast of noncontractual cash flows supported by market projections from reputable sources, as determined by the Secretary;

(iii) cash sweeps and other structure enhancements;

(iv) the projected financial strength of the loan recipient—

(I) at the time of loan close; and

(II) throughout the loan term after the project is completed;

(v) the financial strength of the investors and strategic partners of the loan recipient, if applicable; and

(vi) other financial metrics and analyses that are relied on by the private lending community and nationally recognized credit rating agencies, as determined appropriate by the Secretary.

(4) RATES, TERMS, AND REPAYMENT OF LOANS.—A loan provided under this subsection—

(A) shall have an interest rate that, as of the date on which the loan is made, is equal to the cost of funds to the Department of the Treasury for obligations of comparable maturity;

(B) shall have a term equal to the lesser of—

(i) the projected life, in years, of the eligible project to be carried out using funds from the loan, as determined by the Secretary; and

(ii) 25 years;

(C) may be subject to a deferral in repayment for not more than 5 years after the date on which the eligible project carried out using funds from the loan first begins operations, as determined by the Secretary;

(D) shall be made by the Federal Financing Bank; and

(E) shall be subject to the condition that the loan is not subordinate to other financing.

(5) CONFLICTS OF INTEREST.—For each eligible project selected to receive a loan under this subsection, the Secretary shall certify that political influence did not impact the selection of the eligible project.

(e) IMPROVEMENT.—Not later than 60 days after the enactment of the Continuing Appropriations Resolution, 2009, the Secretary shall promulgate an interim final rule establishing regulations that the Secretary deems necessary to administer this section and any loans made by the Secretary pursuant to this section. Such interim final rule shall require that, in order for an automobile manufacturer to be eligible for an award or loan under this section during a particular year, the adjusted average fuel economy of the manufacturer for light duty vehicles produced by the manufacturer during the most recent year for which data are available shall be not

less than the average fuel economy for all light duty vehicles of the manufacturer for model year 2005. In order to determine fuel economy baselines for eligibility of a new manufacturer or a manufacturer that has not produced previously produced equivalent vehicles, the Secretary may substitute industry averages.

(f) FEES.—Administrative costs shall be no more than \$100,000 or 10 basis point of the loan.

(g) PRIORITY.—The Secretary shall, in making awards or loans to those manufacturers that have existing facilities, give priority to those facilities that are oldest or have been in existence for at least 20 years or are utilized primarily for the manufacture of ultra efficient vehicles. Such facilities can currently be sitting idle.

(h) SET ASIDE FOR SMALL ADVANCED TECHNOLOGY VEHICLE MANUFACTURERS AND COMPONENT SUPPLIERS.—

(1) DEFINITION OF COVERED FIRM.—In this subsection, the term “covered firm” means a firm that—

(A) employs less than 500 individuals; and

(B) manufactures ultra efficient vehicles, advanced technology vehicles, or components of advanced technology vehicles.

(2) SET ASIDE.—Of the amount of funds that are used to provide awards for each fiscal year under subsection (b), the Secretary shall use not less than 10 percent to provide awards to covered firms or consortia led by a covered firm.

(i) APPOINTMENT AND PAY OF PERSONNEL.—(1) The Secretary may use direct hiring authority pursuant to section 3304(b)(3) of title 5, United States Code, to appoint such professional and administrative personnel as the Secretary deems necessary to the discharge of the Secretary’s functions under this section.

(2) The rate of pay for a person appointed pursuant to paragraph (1) shall not exceed the maximum rate payable for GS-15 of the General Schedule under chapter 53 such title 5.

(3) The Secretary may retain such consultants as the Secretary deems necessary to the discharge of the functions required by this section, pursuant to section 31 of the Office of Federal Procurement Policy Act (41 U.S.C. 427).

(j) COORDINATION.—In carrying out this section, the Secretary shall coordinate with relevant vehicle, bioenergy, and hydrogen and fuel cell demonstration project activities supported by the Department.

(k) OUTREACH.—In carrying out this section, the Secretary shall—

(1) provide assistance with the completion of applications for awards or loans under this section; and

(2) conduct outreach, including through conferences and online programs, to disseminate information on awards and loans under this section to potential applicants.

【Subsection (l) was repealed by section 308 division D of Public Law 117–328.】

(m) REPORT.—Not later than 2 years after the date of enactment of this subsection, and every 3 years thereafter, the Secretary shall submit to Congress a report on the status of projects supported by a loan under this section, including—

- (1) a list of projects receiving a loan under this section, including the loan amount and construction status of each project;
- (2) the status of the loan repayment for each project, including future repayment projections;
- (3) data regarding the number of direct and indirect jobs retained, restored, or created by financed projects;
- (4) the number of new projects projected to receive a loan under this section in the next 2 years, including the projected aggregate loan amount over the next 2 years;
- (5) evaluation of ongoing compliance with the assurances and commitments, and of the predictions, made by applicants pursuant to paragraphs (2) and (3) of subsection (d);
- (6) the total number of applications received by the Department each year; and
- (7) any other metrics the Secretary determines appropriate.

SEC. 137. [42 U.S.C. 17014] RESEARCH AND DEVELOPMENT INTO INTEGRATING ELECTRIC VEHICLES ONTO THE ELECTRIC GRID.

(a) **IN GENERAL.**—The Secretary shall establish a research, development, and demonstration program to advance the integration of electric vehicles, including plug-in hybrid electric vehicles, onto the electric grid.

(b) **VEHICLES-TO-GRID INTEGRATION ASSESSMENT REPORT.**—Not later than 1 year after the enactment of this section, the Secretary 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 results of a study that examines the research, development, and demonstration opportunities, challenges, and standards needed for integrating electric vehicles onto the electric grid.

(1) **REPORT REQUIREMENTS.**—The report shall include—

(A) an evaluation of the use of electric vehicles to maintain the reliability of the electric grid, including—

(i) the use of electric vehicles for demand response, load shaping, emergency power, and frequency regulation; and

(ii) the potential for the reuse of spent electric vehicle batteries for stationary grid storage;

(B) the impact of grid integration on electric vehicles, including—

(i) the impact of bi-directional electricity flow on battery degradation; and

(ii) the implications of the use of electric vehicles for grid services on original equipment manufacturer warranties;

(C) the impacts to the electric grid of increased penetration of electric vehicles, including—

(i) the distribution grid infrastructure needed to support an increase in charging capacity;

(ii) strategies for integrating electric vehicles onto the distribution grid while limiting infrastructure upgrades;

(iii) the changes in electricity demand over a 24-hour cycle due to electric vehicle charging behavior;

(iv) the load increases expected from electrifying the transportation sector;

(v) the potential for customer incentives and other managed charging stations strategies to shift charging off-peak;

(vi) the technology needed to achieve bi-directional power flow on the distribution grid; and

(vii) the implementation of smart charging techniques;

(D) research on the standards needed to integrate electric vehicles with the grid, including communications systems, protocols, and charging stations, in collaboration with the National Institute for Standards and Technology;

(E) the cybersecurity challenges and needs associated with electrifying the transportation sector; and

(F) an assessment of the feasibility of adopting technologies developed under the program established under subsection (a) at Department facilities.

(2) RECOMMENDATIONS.—As part of the Vehicles-to-Grid Integration Assessment Report, the Secretary shall develop a 10-year roadmap to guide the research, development, and demonstration program to integrate electric vehicles onto the electric grid.

(3) CONSULTATION.—In developing this report, the Secretary shall consult with relevant stakeholders, including—

(A) electric vehicle manufacturers;

(B) electric utilities;

(C) public utility commissions;

(D) vehicle battery manufacturers;

(E) electric vehicle supply equipment manufacturers;

(F) charging infrastructure manufacturers;

(G) the National Laboratories; and

(H) other Federal agencies, as the Secretary determines appropriate.

(4) UPDATES.—The Secretary shall update the report required under this section every 3 years for the duration of the program under section (a) and shall submit the updated 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.

(c) PROGRAM IMPLEMENTATION.—In carrying out the research, development, demonstration, and commercial application aims of section, the Secretary shall—

(1) implement the recommendations set forth in the report in subsection (b); and

(2) coordinate across all relevant program offices at the Department to achieve the goals established in this section, including the Office of Electricity.

(d) TESTING CAPABILITIES.—The Secretary shall coordinate with the National Laboratories to develop testing capabilities for

the evaluation, rapid prototyping, and optimization of technologies enabling integration of electric vehicles onto the electric grid.

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TITLE IV—ENERGY SAVINGS IN BUILDINGS AND INDUSTRY

Subtitle A—Residential Building Efficiency

* * * * *

SEC. 413. [42 U.S.C. 17071] ENERGY CODE IMPROVEMENTS APPLICABLE TO MANUFACTURED HOUSING.

(a) ESTABLISHMENT OF STANDARDS.—

(1) IN GENERAL.—Not later than 4 years after the date of enactment of this Act, the Secretary shall by regulation establish standards for energy efficiency in manufactured housing.

(2) NOTICE, COMMENT, AND CONSULTATION.—Standards described in paragraph (1) shall be established after—

(A) notice and an opportunity for comment by manufacturers of manufactured housing and other interested parties; and

(B) consultation with the Secretary of Housing and Urban Development, who may seek further counsel from the Manufactured Housing Consensus Committee.

(b) REQUIREMENTS.—

(1) INTERNATIONAL ENERGY CONSERVATION CODE.—The energy conservation standards established under this section shall be based on the most recent version of the International Energy Conservation Code (including supplements), except in cases in which the Secretary finds that the code is not cost-effective, or a more stringent standard would be more cost-effective, based on the impact of the code on the purchase price of manufactured housing and on total life-cycle construction and operating costs.

(2) CONSIDERATIONS.—The energy conservation standards established under this section may—

(A) take into consideration the design and factory construction techniques of manufactured homes;

(B) be based on the climate zones established by the Department of Housing and Urban Development rather than the climate zones under the International Energy Conservation Code; and

(C) provide for alternative practices that result in net estimated energy consumption equal to or less than the specified standards.

(3) UPDATING.—The energy conservation standards established under this section shall be updated not later than—

(A) 1 year after the date of enactment of this Act; and

(B) 1 year after any revision to the International Energy Conservation Code.

(c) ENFORCEMENT.—Any manufacturer of manufactured housing that violates a provision of the regulations under subsection (a)

is liable to the United States for a civil penalty in an amount not exceeding 1 percent of the manufacturer's retail list price of the manufactured housing.

Subtitle B—High-Performance Commercial Buildings

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SEC. 422. [42 U.S.C. 17082] ZERO NET ENERGY COMMERCIAL BUILDINGS INITIATIVE.

(a) DEFINITIONS.—In this section:

(1) CONSORTIUM.—The term “consortium” means a High-Performance Green Building Consortium selected by the Commercial Director.

(2) INITIATIVE.—The term “initiative” means the Zero-Net-Energy Commercial Buildings Initiative established under subsection (b)(1).

(3) ZERO-NET-ENERGY COMMERCIAL BUILDING.—The term “zero-net-energy commercial building” means a high-performance commercial building that is designed, constructed, and operated—

(A) to require a greatly reduced quantity of energy to operate;

(B) to meet the balance of energy needs from sources of energy that do not produce greenhouse gases;

(C) in a manner that will result in no net emissions of greenhouse gases; and

(D) to be economically viable.

(b) ESTABLISHMENT.—

(1) IN GENERAL.—The Commercial Director shall establish an initiative, to be known as the “Zero-Net-Energy Commercial Buildings Initiative”—

(A) to reduce the quantity of energy consumed by commercial buildings located in the United States; and

(B) to achieve the development of zero net energy commercial buildings in the United States.

(2) CONSORTIUM.—

(A) IN GENERAL.—Not later than 180 days after the date of enactment of this Act, the Commercial Director shall competitively select, and enter into an agreement with, a consortium to develop and carry out the initiative.

(B) AGREEMENTS.—In entering into an agreement with a consortium under subparagraph (A), the Commercial Director shall use the authority described in section 646(g) of the Department of Energy Organization Act (42 U.S.C. 7256(g)), to the maximum extent practicable.

(c) GOAL OF INITIATIVE.—The goal of the initiative shall be to develop and disseminate technologies, practices, and policies for the development and establishment of zero net energy commercial buildings for—

(1) any commercial building newly constructed in the United States by 2030;

(2) 50 percent of the commercial building stock of the United States by 2040; and

(3) all commercial buildings in the United States by 2050.

(d) COMPONENTS.—In carrying out the initiative, the Commercial Director, in consultation with the consortium, may—

(1) conduct research and development on building science, design, materials, components, equipment and controls, operation and other practices, integration, energy use measurement, and benchmarking;

(2) conduct pilot programs and demonstration projects to evaluate replicable approaches to achieving energy efficient commercial buildings for a variety of building types in a variety of climate zones;

(3) conduct deployment, dissemination, and technical assistance activities to encourage widespread adoption of technologies, practices, and policies (including demand-response technologies, practices, and policies) to achieve energy efficient commercial buildings;

(4) conduct other research, development, demonstration, and deployment activities necessary to achieve each goal of the initiative, as determined by the Commercial Director, in consultation with the consortium;

(5) develop training materials and courses for building professionals and trades on achieving cost-effective high-performance energy efficient buildings;

(6) develop and disseminate public education materials to share information on the benefits and cost-effectiveness of high-performance energy efficient buildings;

(7) support code-setting organizations and State and local governments in developing minimum performance standards in building codes that recognize the ready availability of many technologies utilized in high-performance energy efficient buildings;

(8) develop strategies for overcoming the split incentives between builders and purchasers, and landlords and tenants, to ensure that energy efficiency and high-performance investments are made that are cost-effective on a lifecycle basis; and

(9) develop improved means of measurement and verification of energy savings and performance for public dissemination.

(e) COST SHARING.—In carrying out this section, the Commercial Director shall require cost sharing in accordance with section 988 of the Energy Policy Act of 2005 (42 U.S.C. 16352).

(f) AUTHORIZATION OF APPROPRIATIONS.—There are authorized to be appropriated to carry out this section—

(1) \$20,000,000 for fiscal year 2008;

(2) \$50,000,000 for each of fiscal years 2009 and 2010;

(3) \$100,000,000 for each of fiscal years 2011 and 2012;

and

(4) \$200,000,000 for each of fiscal years 2013 through 2018.

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SEC. 424. [42 U.S.C. 17084] SEPARATE SPACES WITH HIGH-PERFORMANCE ENERGY EFFICIENCY MEASURES.

(a) **DEFINITIONS.**—In this section:

(1) **HIGH-PERFORMANCE ENERGY EFFICIENCY MEASURE.**—The term “high-performance energy efficiency measure” means a technology, product, or practice that will result in substantial operational cost savings by reducing energy consumption and utility costs.

(2) **SEPARATE SPACES.**—The term “separate spaces” means areas within a commercial building that are leased or otherwise occupied by a tenant or other occupant for a period of time pursuant to the terms of a written agreement.

(b) **STUDY.**—

(1) **IN GENERAL.**—Not later than 1 year after the date of enactment of this section, the Secretary, acting through the Assistant Secretary of Energy Efficiency and Renewable Energy, shall complete a study on the feasibility of—

(A) significantly improving energy efficiency in commercial buildings through the design and construction, by owners and tenants, of separate spaces with high-performance energy efficiency measures; and

(B) encouraging owners and tenants to implement high-performance energy efficiency measures in separate spaces.

(2) **SCOPE.**—The study shall, at a minimum, include—

(A) descriptions of—

(i) high-performance energy efficiency measures that should be considered as part of the initial design and construction of separate spaces;

(ii) processes that owners, tenants, architects, and engineers may replicate when designing and constructing separate spaces with high-performance energy efficiency measures;

(iii) policies and best practices to achieve reductions in energy intensities for lighting, plug loads, heating, cooling, cooking, laundry, and other systems to satisfy the needs of the commercial building tenant;

(iv) return on investment and payback analyses of the incremental cost and projected energy savings of the proposed set of high-performance energy efficiency measures, including consideration of available incentives;

(v) models and simulation methods that predict the quantity of energy used by separate spaces with high-performance energy efficiency measures and that compare that predicted quantity to the quantity of energy used by separate spaces without high-performance energy efficiency measures but that otherwise comply with applicable building code requirements;

(vi) measurement and verification platforms demonstrating actual energy use of high-performance energy efficiency measures installed in separate spaces, and whether such measures generate the savings in-

tended in the initial design and construction of the separate spaces;

(vii) best practices that encourage an integrated approach to designing and constructing separate spaces to perform at optimum energy efficiency in conjunction with the central systems of a commercial building; and

(viii) any impact on employment resulting from the design and construction of separate spaces with high-performance energy efficiency measures; and

(B) case studies reporting economic and energy savings returns in the design and construction of separate spaces with high-performance energy efficiency measures.

(3) PUBLIC PARTICIPATION.—Not later than 90 days after the date of the enactment of this section, the Secretary shall publish a notice in the Federal Register requesting public comments regarding effective methods, measures, and practices for the design and construction of separate spaces with high-performance energy efficiency measures.

(4) PUBLICATION.—The Secretary shall publish the study on the website of the Department of Energy.

SEC. 425. [42 U.S.C. 17085] TENANT STAR PROGRAM.

(a) DEFINITIONS.—In this section:

(1) HIGH-PERFORMANCE ENERGY EFFICIENCY MEASURE.—The term “high-performance energy efficiency measure” has the meaning given the term in section 424.

(2) SEPARATE SPACES.—The term “separate spaces” has the meaning given the term in section 424.

(b) TENANT STAR.—The Administrator of the Environmental Protection Agency, in consultation with the Secretary of Energy, shall develop a voluntary program within the Energy Star program established by section 324A of the Energy Policy and Conservation Act (42 U.S.C. 6294a), which may be known as “Tenant Star”, to promote energy efficiency in separate spaces leased by tenants or otherwise occupied within commercial buildings.

(c) EXPANDING SURVEY DATA.—The Secretary of Energy, acting through the Administrator of the Energy Information Administration, shall—

(1) collect, through each Commercial Buildings Energy Consumption Survey of the Energy Information Administration that is conducted after the date of enactment of this section, data on—

(A) categories of building occupancy that are known to consume significant quantities of energy, such as occupancy by data centers, trading floors, and restaurants; and

(B) other aspects of the property, building operation, or building occupancy determined by the Administrator of the Energy Information Administration, in consultation with the Administrator of the Environmental Protection Agency, to be relevant in lowering energy consumption;

(2) with respect to the first Commercial Buildings Energy Consumption Survey conducted after the date of enactment of this section, to the extent full compliance with the require-

ments of paragraph (1) is not feasible, conduct activities to develop the capability to collect such data and begin to collect such data; and

(3) make data collected under paragraphs (1) and (2) available to the public in aggregated form and provide such data, and any associated results, to the Administrator of the Environmental Protection Agency for use in accordance with subsection (d).

(d) RECOGNITION OF OWNERS AND TENANTS.—

(1) OCCUPANCY-BASED RECOGNITION.—Not later than 1 year after the date on which sufficient data is received pursuant to subsection (c), the Administrator of the Environmental Protection Agency shall, following an opportunity for public notice and comment—

(A) in a manner similar to the Energy Star rating system for commercial buildings, develop policies and procedures to recognize tenants in commercial buildings that voluntarily achieve high levels of energy efficiency in separate spaces;

(B) establish building occupancy categories eligible for Tenant Star recognition based on the data collected under subsection (c) and any other appropriate data sources; and

(C) consider other forms of recognition for commercial building tenants or other occupants that lower energy consumption in separate spaces.

(2) DESIGN- AND CONSTRUCTION-BASED RECOGNITION.—After the study required by section 424(b) is completed, the Administrator of the Environmental Protection Agency, in consultation with the Secretary and following an opportunity for public notice and comment, may develop a voluntary program to recognize commercial building owners and tenants that use high-performance energy efficiency measures in the design and construction of separate spaces.

SEC. 426. [42 U.S.C. 17086] ADVANCED INTEGRATION OF BUILDINGS ONTO THE ELECTRIC GRID.

(a) IN GENERAL.—The Secretary shall establish a program of research, development, and demonstration to enable components of commercial and residential buildings to serve as dynamic energy loads on and resources for the electric grid. The program shall focus on—

(1) developing low-cost, low power, wireless sensors to—

(A) monitor building energy load;

(B) forecast building energy need; and

(C) enable building-level energy control;

(2) developing data management capabilities and standard communication protocols to further interoperability at the building and grid-level;

(3) developing advanced building-level energy management of components through integration of smart technologies, control systems, and data processing, to enable energy efficiency and savings;

(4) optimizing energy consumption at the building level to enable grid stability and resilience;

(5) improving visualization of behind the meter equipment and technologies to provide better insight into the energy needs and energy forecasts of individual buildings;

(6) reducing the cost of key components to accelerate the adoption of smart building technologies;

(7) protecting against cybersecurity threats and addressing security vulnerabilities of building systems or equipment; and

(8) other areas determined appropriate by the Secretary.

(b) CONSIDERATIONS.—In carrying out the program under subsection (a), the Secretary shall—

(1) work with utility partners, building owners, technology vendors, and building developers to test and validate technologies and encourage the commercial application of these technologies by building owners; and

(2) consider the specific challenges of enabling greater interaction between components of—

(A) small- and medium-sized buildings and the electric grid; and

(B) residential and commercial buildings and the electric grid.

(c) BUILDINGS-TO-GRID INTEGRATION REPORT.—Not later than 1 year after the enactment of this section, the Secretary shall submit to the Committee on Science, Space, and Technology and the Committee on Energy and Commerce of the House of Representatives and the Committee on Energy and Natural Resources of the Senate a report on the results of a study that examines the research, development, and demonstration opportunities, challenges, and standards needed to enable components of commercial and residential buildings to serve as dynamic energy loads on and resources for the electric grid.

(1) REPORT REQUIREMENTS.—The report shall include—

(A) an assessment of the technologies needed to enable building components as dynamic loads on and resources for the electric grid, including how such technologies can be—

(i) incorporated into new commercial and residential buildings; and

(ii) retrofitted in older buildings;

(B) guidelines for the design of new buildings and building components to enable modern grid interactivity and improve energy efficiency;

(C) an assessment of barriers to the adoption by building owners of advanced technologies enabling greater integration of building components onto the electric grid; and

(D) an assessment of the feasibility of adopting technologies developed under subsection (a) at Department facilities.

(2) RECOMMENDATIONS.—As part of the report, the Secretary shall develop a 10-year roadmap to guide the research, development, and demonstration program to enable components of commercial and residential buildings to serve as dynamic energy loads on and resources for the electric grid.

(3) UPDATES.—The Secretary shall update the report required under this section every 3 years for the duration of the program under subsection (a) and shall submit the updated re-

port to the Committee on Science, Space, and Technology and the Committee on Energy and Commerce of the House of Representatives and the Committee on Energy and Natural Resources of the Senate.

(d) PROGRAM IMPLEMENTATION.—In carrying out this section, the Secretary shall—

(1) implement the recommendations from the report in subsection (c); and

(2) coordinate across all relevant program offices at the Department to achieve the goals established in this section, including the Office of Electricity.

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Subtitle D—Industrial Energy Efficiency

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SEC. 452. [42 U.S.C. 17111] FUTURE OF INDUSTRY PROGRAM.

(a) DEFINITIONS.—In this section:

(1) ELIGIBLE ENTITY.—The term “eligible entity” means—

(A) an energy-intensive industry;

(B) a national trade association representing an energy-intensive industry; or

(C) a person acting on behalf of 1 or more energy-intensive industries or sectors, as determined by the Secretary.

(2) ENERGY-INTENSIVE INDUSTRY.—The term “energy-intensive industry” means an industry that uses significant quantities of energy as part of its primary economic activities, including—

(A) information technology, including data centers containing electrical equipment used in processing, storing, and transmitting digital information;

(B) consumer product manufacturing;

(C) food processing;

(D) materials manufacturers, including—

(i) aluminum;

(ii) chemicals;

(iii) forest and paper products;

(iv) metal casting;

(v) glass;

(vi) petroleum refining;

(vii) mining; and

(viii) steel;

(E) water and wastewater treatment facilities, including systems that treat municipal, industrial, and agricultural waste; and

(F) other energy-intensive industries, as determined by the Secretary.

(3) FEEDSTOCK.—The term “feedstock” means the raw material supplied for use in manufacturing, chemical, and biological processes.

(4) PARTNERSHIP.—The term “partnership” means an energy efficiency partnership established under subsection (c)(1)(A).

(5) PROGRAM.—The term “program” means the energy-intensive industries program established under subsection (b).

(b) ESTABLISHMENT OF PROGRAM.—The Secretary shall establish a program under which the Secretary, in cooperation with energy-intensive industries and national industry trade associations representing the energy-intensive industries, shall support, research, develop, and promote the use of new materials processes, technologies, and techniques to optimize energy efficiency and the economic competitiveness of the United States’ industrial and commercial sectors.

(c) PARTNERSHIPS.—

(1) IN GENERAL.—As part of the program, the Secretary shall establish energy efficiency partnerships between the Secretary and eligible entities to conduct research on, develop, and demonstrate new processes, technologies, and operating practices and techniques to significantly improve the energy efficiency of equipment and processes used by energy-intensive industries, including the conduct of activities to—

(A) increase the energy efficiency of industrial processes and facilities;

(B) research, develop, and demonstrate advanced technologies capable of energy intensity reductions and increased environmental performance; and

(C) promote the use of the processes, technologies, and techniques described in subparagraphs (A) and (B).

(2) ELIGIBLE ACTIVITIES.—Partnership activities eligible for funding under this subsection include—

(A) feedstock and recycling research, development, and demonstration activities to identify and promote—

(i) opportunities for meeting industry feedstock requirements with more energy efficient and flexible sources of feedstock or energy supply;

(ii) strategies to develop and deploy technologies that improve the quality and quantity of feedstocks recovered from process and waste streams; and

(iii) other methods using recycling, reuse, and improved industrial materials;

(B) research to develop and demonstrate technologies and processes that utilize alternative energy sources to supply heat, power, and new feedstocks for energy-intensive industries;

(C) research to achieve energy efficiency in steam, power, control system, and process heat technologies, and in other manufacturing processes; and

(D) industrial and commercial energy efficiency and sustainability assessments to—

(i) assist individual industrial and commercial sectors in developing tools, techniques, and methodologies to assess—

(I) the unique processes and facilities of the sectors;

(II) the energy utilization requirements of the sectors; and

(III) the application of new, more energy efficient technologies; and

(ii) conduct energy savings assessments;

(E) the incorporation of technologies and innovations that would significantly improve the energy efficiency and utilization of energy-intensive commercial applications; and

(F) any other activities that the Secretary determines to be appropriate.

(3) PROPOSALS.—

(A) IN GENERAL.—To be eligible for funding under this subsection, a partnership shall submit to the Secretary a proposal that describes the proposed research, development, or demonstration activity to be conducted by the partnership.

(B) REVIEW.—After reviewing the scientific, technical, and commercial merit of a proposals submitted under subparagraph (A), the Secretary shall approve or disapprove the proposal.

(C) COMPETITIVE AWARDS.—The provision of funding under this subsection shall be on a competitive basis.

(4) COST-SHARING REQUIREMENT.—In carrying out this section, the Secretary shall require cost sharing in accordance with section 988 of the Energy Policy Act of 2005 (42 U.S.C. 16352).

(d) GRANTS.—The Secretary may award competitive grants for innovative technology research, development and demonstrations to universities, individual inventors, and small companies, based on energy savings potential, commercial viability, and technical merit.

(e) AUTHORIZATION OF APPROPRIATIONS.—

(1) IN GENERAL.—There are authorized to be appropriated to the Secretary to carry out this section—

(A) \$184,000,000 for fiscal year 2008;

(B) \$190,000,000 for fiscal year 2009;

(C) \$196,000,000 for fiscal year 2010;

(D) \$202,000,000 for fiscal year 2011;

(E) \$208,000,000 for fiscal year 2012; and

(F) such sums as are necessary for fiscal year 2013 and each fiscal year thereafter.

(2) PARTNERSHIP ACTIVITIES.—Of the amounts made available under paragraph (1), not less than 50 percent shall be used to pay the Federal share of partnership activities under subsection (c).

(3) COORDINATION AND NONDUPLICATION.—The Secretary shall coordinate efforts under this section with other programs of the Department and other Federal agencies to avoid duplication of effort.

SEC. 453. [42 U.S.C. 17112] ENERGY EFFICIENCY FOR DATA CENTER BUILDINGS.

(a) DEFINITIONS In this section:

(1) DATA CENTER.—The term “data center” means any facility that primarily contains electronic equipment used to

process, store, and transmit digital information, which may be—

(A) a free-standing structure; or

(B) a facility within a larger structure, that uses environmental control equipment to maintain the proper conditions for the operation of electronic equipment.

(2) DATA CENTER OPERATOR.—The term “data center operator” means any person or government entity that builds or operates a data center or purchases data center services, equipment, and facilities.

(b) VOLUNTARY NATIONAL INFORMATION PROGRAM.—

(1) IN GENERAL.—Not later than 90 days after the date of enactment of this Act, the Secretary and the Administrator of the Environmental Protection Agency shall, after consulting with information technology industry and other interested parties, initiate a voluntary national information program for those types of data centers and data center equipment and facilities that are widely used and for which there is a potential for significant data center energy savings as a result of the program.

(2) REQUIREMENTS.—The program described in paragraph (1) shall—

(A) address data center efficiency holistically, reflecting the total energy consumption of data centers as whole systems, including both equipment and facilities;

(B) consider prior work and studies undertaken in this area, including by the Environmental Protection Agency and the Department of Energy;

(C) consistent with the objectives described in paragraph (1), determine the type of data center and data center equipment and facilities to be covered under the program;

(D) produce specifications, measurements, best practices, and benchmarks that will enable data center operators to make more informed decisions about the energy efficiency and costs of data centers, and that take into account—

(i) the performance and use of servers, data storage devices, and other information technology equipment;

(ii) the efficiency of heating, ventilation, and air conditioning, cooling, and power conditioning systems, provided that no modification shall be required of a standard then in effect under the Energy Policy and Conservation Act (42 U.S.C. 6201 et seq.) for any covered heating, ventilation, air-conditioning, cooling or power-conditioning product;

(iii) energy savings from the adoption of software and data management techniques; and

(iv) other factors proposed by the stakeholders described in subsection (c);

(E) allow for creation of separate specifications, measurements, and benchmarks based on data center size and function, as well as other appropriate characteristics;

(F) advance the design and implementation of efficiency technologies to the maximum extent economically practical;

(G) provide to data center operators in the private sector and the Federal Government information about best practices and purchasing decisions that reduce the energy consumption of data centers; and

(H) publish the information described in subparagraph (G), which may be disseminated through catalogs, trade publications, the Internet, or other mechanisms, that will allow data center operators to assess the energy consumption and potential cost savings of alternative data centers and data center equipment and facilities.

(c) STAKEHOLDER INVOLVEMENT.—

(1) IN GENERAL.—The Secretary and the Administrator shall carry out subsection (b) in collaboration with the information technology industry and other key stakeholders, with the goal of producing results that accurately reflect the most relevant and useful information.

(2) CONSIDERATIONS.—In carrying out the collaboration described in paragraph (1), the Secretary and the Administrator shall pay particular attention to organizations that—

(A) have members with expertise in energy efficiency and in the development, operation, and functionality of data centers, information technology equipment, and software, including representatives of hardware manufacturers, data center operators, and facility managers;

(B) obtain and address input from the National Laboratories (as that term is defined in section 2 of the Energy Policy Act of 2005 (42 U.S.C. 15801)) or any institution of higher education, research institution, industry association, company, or public interest group with applicable expertise;

(C) follow—

(i) commonly accepted procedures for the development of specifications; and

(ii) accredited standards development processes; or

(D) have a mission to promote energy efficiency for data centers and information technology.

(d) MEASUREMENTS AND SPECIFICATIONS.—The Secretary and the Administrator shall consider and assess the adequacy of the specifications, measurements, best practices, and benchmarks described in subsection (b) for use by the Federal Energy Management Program, the Energy Star Program, and other efficiency programs of the Department of Energy or the Environmental Protection Agency.

(e) STUDY.—

(1) DEFINITION OF REPORT.—In this subsection, the term “report” means the report of the Lawrence Berkeley National Laboratory entitled ‘United States Data Center Energy Usage Report’ and dated June 2016, which was prepared as an update to the “Report to Congress on Server and Data Center Energy Efficiency”, published on August 2, 2007, pursuant to section 1 of Public Law 109–431 (120 Stat. 2920).

(2) STUDY.—Not later than 4 years after the date of enactment of the Energy Act of 2020, the Secretary, in collaboration with the Administrator, shall make available to the public an update to the report that provides—

(A) a comparison and gap analysis of the estimates and projections contained in the report with new data regarding the period from 2015 through 2019;

(B) an analysis considering the impact of information technologies, including virtualization and cloud computing, in the public and private sectors;

(C) an evaluation of the impact of the combination of cloud platforms, mobile devices, social media, and big data on data center energy usage;

(D) an evaluation of water usage in data centers and recommendations for reductions in that water usage; and

(E) updated projections and recommendations for best practices through fiscal year 2025.

(f) DATA CENTER ENERGY PRACTITIONER PROGRAM.—

(1) IN GENERAL.—The Secretary, in collaboration with key stakeholders and the Director of the Office of Management and Budget, shall maintain a data center energy practitioner program that provides for the certification of energy practitioners qualified to evaluate the energy usage and efficiency opportunities in federally owned and operated data centers.

(2) EVALUATIONS.—Each Federal agency shall consider having the data centers of the agency evaluated once every 4 years by energy practitioners certified pursuant to the program, whenever practicable using certified practitioners employed by the agency.

(g) OPEN DATA INITIATIVE.—

(1) IN GENERAL.—The Secretary, in collaboration with key stakeholders and the Director of the Office of Management and Budget, shall establish an open data initiative relating to energy usage at federally owned and operated data centers, with the purpose of making the data available and accessible in a manner that encourages further data center innovation, optimization, and consolidation.

(2) CONSIDERATION.—In establishing the initiative under paragraph (1), the Secretary shall consider using the online Data Center Maturity Model.

(h) INTERNATIONAL SPECIFICATIONS AND METRICS.—The Secretary, in collaboration with key stakeholders, shall actively participate in efforts to harmonize global specifications and metrics for data center energy and water efficiency.

(i) DATA CENTER UTILIZATION METRIC.—The Secretary, in collaboration with key stakeholders, shall facilitate in the development of an efficiency metric that measures the energy efficiency of a data center (including equipment and facilities).

(j) PROTECTION OF PROPRIETARY INFORMATION.—The Secretary and the Administrator shall not disclose any proprietary information or trade secrets provided by any individual or company for the purposes of carrying out this section or the programs and initiatives established under this section.

SEC. 454. [42 U.S.C. 17113] INDUSTRIAL EMISSIONS REDUCTION TECHNOLOGY DEVELOPMENT PROGRAM.

(a) **DEFINITIONS.**—In this section:

(1) **DIRECTOR.**—The term “Director” means the Director of the Office of Science and Technology Policy.

(2) **ELIGIBLE ENTITY.**—The term “eligible entity” means—

(A) a scientist or other individual with knowledge and expertise in emissions reduction;

(B) an institution of higher education;

(C) a nongovernmental organization;

(D) a National Laboratory;

(E) a private entity; and

(F) a partnership or consortium of 2 or more entities described in subparagraphs (B) through (E).

(3) **EMISSIONS REDUCTION.**—

(A) **IN GENERAL.**—The term “emissions reduction” means the reduction, to the maximum extent practicable, of net nonwater greenhouse gas emissions to the atmosphere by energy services and industrial processes.

(B) **EXCLUSION.**—The term “emissions reduction” does not include the elimination of carbon embodied in the principal products of industrial manufacturing.

(4) **PROGRAM.**—The term “program” means the program established under subsection (b)(1).

(5) **CRITICAL MATERIAL OR MINERAL.**—The term “critical material or mineral” means a material or mineral that serves an essential function in the manufacturing of a product and has a high risk of a supply disruption, such that a shortage of such a material or mineral would have significant consequences for United States economic or national security.

(b) **INDUSTRIAL EMISSIONS REDUCTION TECHNOLOGY DEVELOPMENT PROGRAM.**—

(1) **IN GENERAL.**—Not later than 1 year after the date of enactment of the Energy Act of 2020, the Secretary, in consultation with the Director, the heads of relevant Federal agencies, National Laboratories, industry, and institutions of higher education, shall establish a crosscutting industrial emissions reduction technology development program of research, development, demonstration, and commercial application to advance innovative technologies that—

(A) increase the technological and economic competitiveness of industry and manufacturing in the United States;

(B) increase the viability and competitiveness of United States industrial technology exports; and

(C) achieve emissions reduction in nonpower industrial sectors.

(2) **COORDINATION.**—In carrying out the program, the Secretary shall—

(A) coordinate with each relevant office in the Department and any other Federal agency;

(B) coordinate and collaborate with the Industrial Technology Innovation Advisory Committee established under section 456; and

- (C) coordinate and seek to avoid duplication with the Future of Industry program established under section 452.
- (3) LEVERAGE OF EXISTING RESOURCES.—In carrying out the program, the Secretary shall leverage, to the maximum extent practicable—
- (A) existing resources and programs of the Department and other relevant Federal agencies; and
 - (B) public-private partnerships.
- (c) FOCUS AREAS.—The program shall focus on—
- (1) industrial production processes, including technologies and processes that—
 - (A) achieve emissions reduction in high emissions industrial materials production processes, including production processes for iron, steel, steel mill products, aluminum, cement, concrete, glass, pulp, paper, and industrial ceramics;
 - (B) achieve emissions reduction in medium- and high-temperature heat generation, including—
 - (i) through electrification of heating processes;
 - (ii) through renewable heat generation technology;
 - (iii) through combined heat and power; and
 - (iv) by switching to alternative fuels, including hydrogen and nuclear energy;
 - (C) achieve emissions reduction in chemical production processes, including by incorporating, if appropriate and practicable, principles, practices, and methodologies of sustainable chemistry and engineering;
 - (D) leverage smart manufacturing technologies and principles, digital manufacturing technologies, and advanced data analytics to develop advanced technologies and practices in information, automation, monitoring, computation, sensing, modeling, and networking to—
 - (i) model and simulate manufacturing production lines;
 - (ii) monitor and communicate production line status;
 - (iii) manage and optimize energy productivity and cost throughout production; and
 - (iv) model, simulate, and optimize the energy efficiency of manufacturing processes;
 - (E) leverage the principles of sustainable manufacturing to minimize the potential negative environmental impacts of manufacturing while conserving energy and resources, including—
 - (i) by designing products that enable reuse, refurbishment, remanufacturing, and recycling;
 - (ii) by minimizing waste from industrial processes, including through the reuse of waste as other resources in other industrial processes for mutual benefit; and
 - (iii) by increasing resource efficiency; and
 - (F) increase the energy efficiency of industrial processes;

(2) alternative materials that produce fewer emissions during production and result in fewer emissions during use, including—

(A) high-performance lightweight materials; and

(B) substitutions for critical materials and minerals;

(3) development of net-zero emissions liquid and gaseous fuels;

(4) emissions reduction in shipping, aviation, and long distance transportation;

(5) carbon capture technologies for industrial processes;

(6) other technologies that achieve net-zero emissions in nonpower industrial sectors, as determined by the Secretary, in consultation with the Director; and

(7) high-performance computing to develop advanced materials and manufacturing processes contributing to the focus areas described in paragraphs (1) through (6), including—

(A) modeling, simulation, and optimization of the design of energy efficient and sustainable products; and

(B) the use of digital prototyping and additive manufacturing to enhance product design.

(8) incorporation of sustainable chemistry and engineering principles, practices, and methodologies, as the Secretary determines appropriate; and

(9) other research or technology areas identified in the Strategic Plan authorized in section 455.

(d) GRANTS, CONTRACTS, COOPERATIVE AGREEMENTS, AND DEMONSTRATION PROJECTS.—

(1) GRANTS.—In carrying out the program, the Secretary shall award grants on a competitive basis to eligible entities for projects that the Secretary determines would best achieve the goals of the program.

(2) CONTRACTS AND COOPERATIVE AGREEMENTS.—In carrying out the program, the Secretary may enter into contracts and cooperative agreements with eligible entities and Federal agencies for projects that the Secretary determines would further the purposes of the program.

(3) DEMONSTRATION PROJECTS.—In supporting technologies developed under this section, the Secretary shall fund demonstration projects that test and validate technologies described in subsection (c).

(4) APPLICATION.—An entity seeking funding or a contract or agreement under this subsection shall submit to the Secretary an application at such time, in such manner, and containing such information as the Secretary may require.

(5) COST SHARING.—In awarding funds under this section, the Secretary shall require cost sharing in accordance with section 988 of the Energy Policy Act of 2005 (42 U.S.C. 16352).

(e) AUTHORIZATION OF APPROPRIATIONS.—There are authorized to be appropriated to the Secretary to carry out the demonstration projects authorized in subsection (d)(3)—

(1) \$20,000,000 for fiscal year 2021;

(2) \$80,000,000 for fiscal year 2022;

(3) \$100,000,000 for fiscal year 2023;

(4) \$150,000,000 for fiscal year 2024; and

(5) \$150,000,000 for fiscal year 2025.

(f) COORDINATION.—The Secretary shall carry out the activities authorized in this section in accordance with section 203 of the Department of Energy Research and Innovation Act (42 U.S.C. 18631).

SEC. 454A. [42 U.S.C. 17113a] LOW-EMISSIONS STEEL MANUFACTURING RESEARCH PROGRAM.

(a) PURPOSE.—The purpose of this section is to encourage the research and development of innovative technologies aimed at—

- (1) increasing the technological and economic competitiveness of industry and manufacturing in the United States; and
- (2) achieving significant net nonwater greenhouse emissions reductions in the production processes for iron, steel, and steel mill products.

(b) DEFINITIONS.—In this section:

(1) COMMERCIALY AVAILABLE STEELMAKING.—The term “commercially available steelmaking” means the current production method of iron, steel, and steel mill products.

(2) CRITICAL MATERIAL.—The term “critical material” has the meaning given such term in section 7002 of division Z of the Consolidated Appropriations Act, 2021 (Public Law 116–260).

(3) CRITICAL MINERAL.—The term “critical mineral” has the meaning given such term in section 7002 of division Z of the Consolidated Appropriations Act, 2021 (Public Law 116–260).

(4) ELIGIBLE ENTITY.—The term “eligible entity” means—

- (A) an institution of higher education;
- (B) an appropriate State or Federal entity, including a federally funded research and development center of the Department;
- (C) a nonprofit research institution;
- (D) a private entity;
- (E) any other relevant entity the Secretary determines appropriate; and
- (F) a partnership or consortium of two or more entities described in subparagraphs (A) through (E).

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

(6) LOW-EMISSIONS STEEL MANUFACTURING.—The term “low-emissions steel manufacturing” means advanced or commercially available steelmaking with the reduction, to the maximum extent practicable, of net nonwater greenhouse gas emissions to the atmosphere from the production of iron, steel, and steel mill products.

(c) IN GENERAL.—Not later than 180 days after the date of enactment of the Research and Development, Competition, and Innovation Act, the Secretary shall establish a program of research, development, demonstration, and commercial application of advanced tools, technologies, and methods for low-emissions steel manufacturing.

(d) REQUIREMENTS.—In carrying out the program under subsection (c), the Secretary shall—

(1) coordinate this program with the programs and activities authorized in title VI of division Z of the Consolidated Appropriations Act, 2021;

(2) coordinate across all relevant program offices of the Department, including the Office of Science, Office of Energy Efficiency and Renewable Energy, the Office of Fossil Energy, and the Office of Nuclear Energy;

(3) leverage, to the extent practicable, the research infrastructure of the Department, including scientific computing user facilities, x-ray light sources, neutron scattering facilities, and nanoscale science research centers; and

(4) conduct research, development, and demonstration of low-emissions steel manufacturing technologies that have the potential to increase domestic production and employment in advanced and commercially available steelmaking.

(e) STRATEGIC PLAN.—

(1) IN GENERAL.—Not later than 180 days after the date of enactment of the Research and Development, Competition, and Innovation Act, the Secretary shall develop a 5-year strategic plan identifying research, development, demonstration, and commercial application goals for the program established in subsection (c). The Secretary shall submit this plan to the Committee on Science, Space, and Technology of the House of Representatives and the Committee on Energy and Natural Resources of the Senate.

(2) CONTENTS.—The strategic plan submitted under paragraph (1) shall—

(A) identify programs at the Department related to low-emissions steel manufacturing that support the research, development, demonstration, and commercial application activities described in this section, and the demonstration projects under subsection (h);

(B) establish technological and programmatic goals to achieve the requirements of subsection (d); and

(C) include timelines for the accomplishment of goals developed under the plan.

(3) UPDATES TO PLAN.—Not less than once every two years, the Secretary 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 an updated version of the plan under paragraph (1).

(f) FOCUS AREAS.—In carrying out the program established in subsection (c), the Secretary shall focus on—

(1) medium- and high-temperature heat generation technologies used for low-emissions steel manufacturing, which may include—

(A) alternative fuels, including hydrogen and biomass;

(B) alternative reducing agents, including hydrogen;

(C) renewable heat generation technology, including solar and geothermal;

(D) electrification of heating processes, including through electrolysis; and

(E) other heat generation sources;

(2) carbon capture technologies for advanced and commercially available steelmaking processes, which may include—

- (A) combustion and chemical looping technologies;
- (B) use of slag to reduce carbon dioxide emissions;
- (C) pre-combustion technologies; and
- (D) post-combustion technologies;

(3) smart manufacturing technologies and principles, digital manufacturing technologies, and advanced data analytics to develop advanced technologies and practices in information, automation, monitoring, computation, sensing, modeling, and networking to—

(A) model and simulate manufacturing production lines;

(B) monitor and communicate production line status; and

(C) model, simulate, and optimize the energy efficiency of manufacturing processes;

(4) technologies and practices that minimize energy and natural resource consumption, which may include—

(A) designing products that enable reuse, refurbishment, remanufacturing, and recycling;

(B) minimizing waste from advanced and commercially available steelmaking processes, including through the reuse of waste as resources in other industrial processes for mutual benefit;

(C) increasing resource efficiency; and

(D) increasing the energy efficiency of advanced and commercially available steelmaking processes;

(5) alternative materials and technologies that produce fewer emissions during production and result in fewer emissions during use, which may include—

(A) innovative raw materials;

(B) high-performance lightweight materials;

(C) substitutions for critical materials and critical minerals; and

(D) other technologies that achieve significant carbon emission reductions in low-emissions steel manufacturing, as determined by the Secretary; and

(6) high-performance computing to develop advanced materials and manufacturing processes contributing to the focus areas described in paragraphs (1) through (5), including—

(A) modeling, simulation, and optimization of the design of energy efficient and sustainable products; and

(B) the use of digital prototyping and additive manufacturing to enhance product design.

(g) TESTING AND VALIDATION.—The Secretary, in consultation with the Director of the National Institute of Standards and Technology, shall support the development of standardized testing and technical validation of advanced and commercially available steelmaking and low-emissions steel manufacturing through collaboration with one or more National Laboratories, and one or more eligible entities.

(h) DEMONSTRATION.—

(1) ESTABLISHMENT.—Not later than 180 days after the date of enactment of the Research and Development, Competition, and Innovation Act, the Secretary, in carrying out the program established in subsection (c), and in collaboration with industry partners, institutions of higher education, and the National Laboratories, shall support an initiative for the demonstration of low-emissions steel manufacturing, as identified by the Secretary, that uses either—

(A) a single technology; or

(B) a combination of multiple technologies.

(2) SELECTION REQUIREMENTS.—Under the initiative established under paragraph (1), the Secretary shall select eligible entities to carry out demonstration projects and to the maximum extent practicable—

(A) encourage regional diversity among eligible entities, including participation by rural States;

(B) encourage technological diversity among eligible entities; and

(C) ensure that specific projects selected—

(i) expand on the existing technology demonstration programs of the Department; and

(ii) prioritize projects that leverage matching funds from non-Federal sources.

(3) REPORTS.—The Secretary 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) not less frequently than once every two years for the duration of the demonstration initiative under this subsection, a report describing the performance of the initiative; and

(B) if the initiative established under this subsection is terminated, an assessment of the success of, and education provided by, the measures carried out by recipients of financial assistance under the initiative.

(i) ADDITIONAL COORDINATION.—

(1) MANUFACTURING U.S.A.—In carrying out this section the Secretary shall consider—

(A) leveraging the resources of relevant existing Manufacturing USA Institutes described in section 34(d) of the National Institute of Standards and Technology Act (15 U.S.C. 278s(d));

(B) integrating program activities into a relevant existing Manufacturing USA Institute; or

(C) establishing a new institute focused on low-emissions steel manufacturing.

(2) OTHER FEDERAL AGENCIES.—In carrying out this section, the Secretary shall coordinate with other Federal agencies that are carrying out research and development initiatives to increase industrial competitiveness and achieve significant net nonwater greenhouse emissions reductions through low-emissions steel manufacturing, including the Department of Defense, Department of Transportation, and the National Institute of Standards and Technology.

SEC. 455. [42 U.S.C. 17114] INDUSTRIAL TECHNOLOGY INNOVATION ADVISORY COMMITTEE.

(a) **DEFINITIONS.**—In this section:

(1) **COMMITTEE.**—The term “Committee” means the Industrial Technology Innovation Advisory Committee established under subsection (b).

(2) **DIRECTOR.**—The term “Director” means the Director of the Office of Science and Technology Policy.

(3) **EMISSIONS REDUCTION.**—The term “emissions reduction” has the meaning given the term in section 454(a).

(4) **PROGRAM.**—The term “program” means the industrial emissions reduction technology development program established under section 454(b)(1).

(b) **ESTABLISHMENT.**—Not later than 180 days after the date of enactment of the Energy Act of 2020, the Secretary, in consultation with the Director, shall establish an advisory committee, to be known as the “Industrial Technology Innovation Advisory Committee”.

(c) **MEMBERSHIP.**—

(1) **APPOINTMENT.**—The Committee shall be comprised of not fewer than 16 members and not more than 20 members, who shall be appointed by the Secretary, in consultation with the Director.

(2) **REPRESENTATION.**—Members appointed pursuant to paragraph (1) shall include—

(A) not less than 1 representative of each relevant Federal agency, as determined by the Secretary;

(B) the Chair of the Secretary of Energy Advisory Board, if that position is filled;

(C) not less than 2 representatives of labor groups;

(D) not less than 3 representatives of the research community, which shall include academia and National Laboratories;

(E) not less than 2 representatives of nongovernmental organizations;

(F) not less than 6 representatives of small- and large-scale industry, the collective expertise of which shall cover every focus area described in section 454(c); and

(F) not less than 1 representative of a State government; and

(G) any other individuals the Secretary, in coordination with the Director, determines to be necessary to ensure that the Committee is comprised of a diverse group of representatives of industry, academia, independent researchers, and public and private entities.

(3) **CHAIR.**—The Secretary shall designate a member of the Committee to serve as Chair.

(d) **DUTIES.**—

(1) **IN GENERAL.**—The Committee shall—

(A) in consultation with the Secretary and the Director, propose missions and goals for the program, which shall be consistent with the purposes of the program described in section 454(b)(1); and

(B) advise the Secretary with respect to the program—

(i) by identifying and evaluating any technologies being developed by the private sector relating to the focus areas described in section 454(c);

(ii) by identifying technology gaps in the private sector or other Federal agencies in those focus areas, and making recommendations to address those gaps;

(iii) by surveying and analyzing factors that prevent the adoption of emissions reduction technologies by the private sector; and

(iv) by recommending technology screening criteria for technology developed under the program to encourage adoption of the technology by the private sector; and

(C) develop the strategic plan described in paragraph (2).

(2) STRATEGIC PLAN.—

(A) PURPOSE.—The purpose of the strategic plan developed under paragraph (1)(C) is to set forth a plan for achieving the goals of the program established in section 454(b)(1), including for the focus areas described in section 454(c).

(B) CONTENTS.—The strategic plan developed under paragraph (1)(C) shall—

(i) specify near-term and long-term qualitative and quantitative objectives relating to each focus area described in section 454(c), including research, development, demonstration, and commercial application objectives;

(ii) leverage existing roadmaps relevant to the program in section 454(b)(1) and the focus areas in section 454(c);

(iii) specify the anticipated timeframe for achieving the objectives specified under clause (i);

(iv) include plans for developing emissions reduction technologies that are globally cost-competitive, including, as applicable, in developing economies;

(v) identify the appropriate role for investment by the Federal Government, in coordination with the private sector, to achieve the objectives specified under clause (i);

(vi) identify the public and private costs of achieving the objectives specified under clause (i); and

(vii) estimate the economic and employment impact in the United States of achieving those objectives.

(e) MEETINGS.—

(1) FREQUENCY.—The Committee shall meet not less frequently than 2 times per year, at the call of the Chair.

(2) INITIAL MEETING.—Not later than 30 days after the date on which the members are appointed under subsection (b), the Committee shall hold its first meeting.

(f) COMMITTEE REPORT.—

(1) IN GENERAL.—Not later than 2 years after the date of enactment of the Energy Act of 2020, and not less frequently than once every 3 years thereafter, the Committee shall submit

to the Secretary a report on the progress of achieving the purposes of the program.

(2) CONTENTS.—The report under paragraph (1) shall include—

(A) a description of any technology innovation opportunities identified by the Committee;

(B) a description of any technology gaps identified by the Committee under subsection (d)(1)(B)(ii);

(C) recommendations for improving technology screening criteria and management of the program;

(D) an evaluation of the progress of the program and the research, development, and demonstration activities funded under the program;

(E) any recommended changes to the focus areas of the program described in section 454(c);

(F) a description of the manner in which the Committee has carried out the duties described in subsection (d)(1) and any relevant findings as a result of carrying out those duties;

(G) if necessary, an update to the strategic plan developed by the Committee under subsection (d)(1)(C);

(H) the progress made in achieving the goals set out in that strategic plan;

(I) a review of the management, coordination, and industry utility of the program;

(J) an assessment of the extent to which progress has been made under the program in developing commercial, cost-competitive technologies in each focus area described in section 454(c); and

(K) an assessment of the effectiveness of the program in coordinating efforts within the Department and with other Federal agencies to achieve the purposes of the program.

(g) REPORT TO CONGRESS.—Not later than 60 days after receiving a report from the Committee under subsection (f), the Secretary shall submit a copy of that report to the Committees on Appropriations and Science, Space, and Technology of the House of Representatives, the Committees on Appropriations and Energy and Natural Resources of the Senate, and any other relevant Committee of Congress.

(h) APPLICABILITY OF FEDERAL ADVISORY COMMITTEE ACT.—Except as otherwise provided in this section, the Federal Advisory Committee Act (5 U.S.C. App.) shall apply to the Committee.

SEC. 456. [42 U.S.C. 17115] TECHNICAL ASSISTANCE PROGRAM TO IMPLEMENT INDUSTRIAL EMISSIONS REDUCTION.

(a) DEFINITIONS.—In this section:

(1) ELIGIBLE ENTITY.—The term “eligible entity” means—

(A) a State;

(B) a unit of local government;

(C) a territory or possession of the United States;

(D) a relevant State or local office, including an energy office;

(E) a tribal organization (as defined in section 3765 of title 38, United States Code);

(F) an institution of higher education; and

(G) a private entity; and

(H) a trade association or technical society.

(2) EMISSIONS REDUCTION.—The term “emissions reduction” has the meaning given the term in section 454(a).

(3) PROGRAM.—The term “program” means the program established under subsection (b).

(b) ESTABLISHMENT.—Not later than 1 year after the date of enactment of the Energy Act of 2020, the Secretary shall establish a program to provide technical assistance to eligible entities to promote the commercial application of emission reduction technologies developed through the program established in section 454(b).

(c) APPLICATIONS.—

(1) IN GENERAL.—An eligible entity desiring technical assistance under the program shall submit to the Secretary an application at such time, in such manner, and containing such information as the Secretary may require.

(2) APPLICATION PROCESS.—The Secretary shall seek applications for technical assistance under the program on a periodic basis, but not less frequently than once every 12 months.

(3) FACTORS FOR CONSIDERATION.—In selecting eligible entities for technical assistance under the program, the Secretary shall, to the maximum extent practicable—

(A) give priority to—

(i) activities carried out with technical assistance under the program that have the greatest potential for achieving emissions reduction in nonpower industrial sectors;

(ii) activities carried out in a State in which there are active or inactive industrial facilities that may be used or retrofitted to carry out activities under the focus areas described in section 454(c); and

(iii) activities carried out in an economically distressed area (as described in section 301(a) of the Public Works and Economic Development Act of 1965 (42 U.S.C. 3161(a))); and

(B) ensure that—

(i) there is geographic diversity among the eligible entities selected; and

(ii) the activities carried out with technical assistance under the program reflect a majority of the focus areas described in section 454(c).

SEC. 457. [42 U.S.C. 17116] INDUSTRIAL RESEARCH AND ASSESSMENT CENTERS.

(a) DEFINITIONS.—In this section:

(1) COVERED PROJECT.—The term “covered project” means a project—

(A) that has been recommended in an energy assessment described in paragraph (2)(A) conducted for an eligible entity; and

(B) with respect to which the plant site of that eligible entity—

(i) improves—

(I) energy efficiency;

- (II) material efficiency;
- (III) cybersecurity; or
- (IV) productivity; or
- (ii) reduces—
 - (I) waste production;
 - (II) greenhouse gas emissions; or
 - (III) nongreenhouse gas pollution.

(2) **ELIGIBLE ENTITY.**—The term “eligible entity” means a small- or medium-sized manufacturer that has had an energy assessment completed by—

- (A) an industrial research and assessment center;
- (B) a Department of Energy Combined Heat and Power Technical Assistance Partnership jointly with an industrial research and assessment center; or
- (C) a third-party assessor that provides an assessment equivalent to an assessment described in subparagraph (A) or (B), as determined by the Secretary.

(3) **ENERGY SERVICE PROVIDER.**—The term “energy service provider” means—

- (A) any business providing technology or services to improve the energy efficiency, water efficiency, power factor, or load management of a manufacturing site or other industrial process in an energy-intensive industry (as defined in section 452(a)); and
- (B) any utility operating under a utility energy service project.

(4) **INDUSTRIAL RESEARCH AND ASSESSMENT CENTER.**—The term “industrial research and assessment center” means—

- (A) an institution of higher education-based industrial research and assessment center that is funded by the Secretary under subsection (b); and
- (B) an industrial research and assessment center at a trade school, community college, or union training program that is funded by the Secretary under subsection (f).

(5) **PROGRAM.**—The term “Program” means the program for implementation grants established under subsection (i)(1).

(6) **SMALL- OR MEDIUM-SIZED MANUFACTURER.**—The term “small- or medium-sized manufacturer” means a manufacturing firm—

- (A) the gross annual sales of which are less than \$100,000,000;
- (B) that has fewer than 500 employees at the plant site of the manufacturing firm; and
- (C) the annual energy bills of which total more than \$100,000 but less than \$3,500,000.

(b) **INSTITUTION OF HIGHER EDUCATION-BASED INDUSTRIAL RESEARCH AND ASSESSMENT CENTERS.**—

(1) **IN GENERAL.**—The Secretary shall provide funding to institution of higher education-based industrial research and assessment centers.

(2) **PURPOSE.**—The purpose of each institution of higher education-based industrial research and assessment center shall be—

- (A) to provide in-depth assessments of small- and medium-sized manufacturer plant sites to evaluate the facilities, services, and manufacturing operations of the plant sites;
- (B) to identify opportunities for optimizing energy efficiency and environmental performance, including implementation of—
- (i) smart manufacturing;
 - (ii) energy management systems;
 - (iii) sustainable manufacturing;
 - (iv) information technology advancements for supply chain analysis, logistics, system monitoring, industrial and manufacturing processes, and other purposes; and
 - (v) waste management systems;
- (C) to promote applications of emerging concepts and technologies in small- and medium-sized manufacturers (including water and wastewater treatment facilities and federally owned manufacturing facilities);
- (D) to promote research and development for the use of alternative energy sources to supply heat, power, and new feedstocks for energy-intensive industries;
- (E) to coordinate with appropriate Federal and State research offices;
- (F) to provide a clearinghouse for industrial process and energy efficiency technical assistance resources; and
- (G) to coordinate with State-accredited technical training centers and community colleges, while ensuring appropriate services to all regions of the United States.
- (c) COORDINATION.—To increase the value and capabilities of the industrial research and assessment centers, the centers shall—
- (1) coordinate with Manufacturing Extension Partnership Centers of the National Institute of Standards and Technology;
 - (2) coordinate with the Federal Energy Management Program and the Building Technologies Office of the Department of Energy to provide building assessment services to manufacturers;
 - (3) increase partnerships with the National Laboratories of the Department of Energy to leverage the expertise, technologies, and research and development capabilities of the National Laboratories for national industrial and manufacturing needs;
 - (4) increase partnerships with energy service providers and technology providers to leverage private sector expertise and accelerate deployment of new and existing technologies and processes for energy efficiency, power factor, and load management;
 - (5) identify opportunities for reducing greenhouse gas emissions and other air emissions; and
 - (6) promote sustainable manufacturing practices for small- and medium-sized manufacturers.
- (d) OUTREACH.—The Secretary shall provide funding for—
- (1) outreach activities by the industrial research and assessment centers to inform small- and medium-sized manufac-

turers of the information, technologies, and services available; and

(2) coordination activities by each industrial research and assessment center to leverage efforts with—

(A) Federal, State, and Tribal efforts;

(B) the efforts of utilities and energy service providers;

(C) the efforts of regional energy efficiency organizations; and

(D) the efforts of other industrial research and assessment centers.

(e) CENTERS OF EXCELLENCE.—

(1) ESTABLISHMENT.—The Secretary shall establish a Center of Excellence at not more than 5 of the highest-performing industrial research and assessment centers, as determined by the Secretary.

(2) DUTIES.—A Center of Excellence shall coordinate with and advise the industrial research and assessment centers located in the region of the Center of Excellence, including—

(A) by mentoring new directors and staff of the industrial research and assessment centers with respect to—

(i) the availability of resources; and

(ii) best practices for carrying out assessments, including through the participation of the staff of the Center of Excellence in assessments carried out by new industrial research and assessment centers;

(B) by providing training to staff and students at the industrial research and assessment centers on new technologies, practices, and tools to expand the scope and impact of the assessments carried out by the centers;

(C) by assisting the industrial research and assessment centers with specialized technical opportunities, including by providing a clearinghouse of available expertise and tools to assist the centers and clients of the centers in assessing and implementing those opportunities;

(D) by identifying and coordinating with regional, State, local, Tribal, and utility energy efficiency programs for the purpose of facilitating efforts by industrial research and assessment centers to connect industrial facilities receiving assessments from those centers with regional, State, local, and utility energy efficiency programs that could aid the industrial facilities in implementing any recommendations resulting from the assessments;

(E) by facilitating coordination between the industrial research and assessment centers and other Federal programs described in paragraphs (1) through (3) of subsection (c); and

(F) by coordinating the outreach activities of the industrial research and assessment centers under subsection (d)(1).

(3) FUNDING.—For each fiscal year, out of any amounts made available to carry out this section under subsection (j), the Secretary shall use not less than \$500,000 to support each Center of Excellence.

(f) EXPANSION OF INDUSTRIAL RESEARCH AND ASSESSMENT CENTERS.—

(1) IN GENERAL.—The Secretary shall provide funding to establish additional industrial research and assessment centers at trade schools, community colleges, and union training programs.

(2) PURPOSE.—

(A) IN GENERAL.—Subject to subparagraph (B), to the maximum extent practicable, an industrial research and assessment center established under paragraph (1) shall have the same purpose as an institution of higher education-based industrial research center that is funded by the Secretary under subsection (b)(1).

(B) CONSIDERATION OF CAPABILITIES.—In evaluating or establishing the purpose of an industrial research and assessment center established under paragraph (1), the Secretary shall take into consideration the varying capabilities of trade schools, community colleges, and union training programs.

(g) WORKFORCE TRAINING.—

(1) INTERNSHIPS.—The Secretary shall pay the Federal share of associated internship programs under which students work with or for industries, manufacturers, and energy service providers to implement the recommendations of industrial research and assessment centers.

(2) APPRENTICESHIPS.—The Secretary shall pay the Federal share of associated apprenticeship programs under which—

(A) students work with or for industries, manufacturers, and energy service providers to implement the recommendations of industrial research and assessment centers; and

(B) employees of facilities that have received an assessment from an industrial research and assessment center work with or for an industrial research and assessment center to gain knowledge on engineering practices and processes to improve productivity and energy savings.

(3) FEDERAL SHARE.—The Federal share of the cost of carrying out internship programs described in paragraph (1) and apprenticeship programs described in paragraph (2) shall be 50 percent.

(h) SMALL BUSINESS LOANS.—The Administrator of the Small Business Administration shall, to the maximum extent practicable, expedite consideration of applications from eligible small business concerns for loans under the Small Business Act (15 U.S.C. 631 et seq.) to implement recommendations developed by the industrial research and assessment centers.

(i) IMPLEMENTATION GRANTS.—

(1) IN GENERAL.—The Secretary shall establish a program under which the Secretary shall provide grants to eligible entities to implement covered projects.

(2) APPLICATION.—An eligible entity seeking a grant under the Program shall submit to the Secretary an application at such time, in such manner, and containing such information as

the Secretary may require, including a demonstration of need for financial assistance to implement the proposed covered project.

(3) **PRIORITY.**—In awarding grants under the Program, the Secretary shall give priority to eligible entities that—

(A) have had an energy assessment completed by an industrial research and assessment center; and

(B) propose to carry out a covered project with a greater potential for—

(i) energy efficiency gains; or

(ii) greenhouse gas emissions reductions.

(4) **GRANT AMOUNT.**—

(A) **MAXIMUM AMOUNT.**—The amount of a grant provided to an eligible entity under the Program shall not exceed \$300,000.

(B) **FEDERAL SHARE.**—A grant awarded under the Program for a covered project shall be in an amount that is not more than 50 percent of the cost of the covered project.

(C) **SUPPLEMENT.**—A grant received by an eligible entity under the Program shall supplement, not supplant, any private or State funds available to the eligible entity to carry out the covered project.

(j) **AUTHORIZATION OF APPROPRIATIONS.**—There are authorized to be appropriated to the Secretary for the period of fiscal years 2022 through 2026—

(1) \$150,000,000 to carry out subsections (a) through (h); and

(2) \$400,000,000 to carry out subsection (i).

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TITLE V—ENERGY SAVINGS IN GOVERNMENT AND PUBLIC INSTITUTIONS

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Subtitle E—Energy Efficiency and Conservation Block Grants

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SEC. 541. [42 U.S.C. 17151] DEFINITIONS.

In this subtitle:

(1) **ELIGIBLE ENTITY.**—The term “eligible entity” means—

(A) a State;

(B) an eligible unit of local government; and

(C) an Indian tribe.

(2) **ELIGIBLE UNIT OF LOCAL GOVERNMENT.**—The term “eligible unit of local government” means—

(A) an eligible unit of local government-alternative 1;

and

(B) an eligible unit of local government-alternative 2.

(3)(A) ELIGIBLE UNIT OF LOCAL GOVERNMENT-ALTERNATIVE
1.—The term “eligible unit of local government-alternative 1” means—

- (i) a city with a population—
 - (I) of at least 35,000; or
 - (II) that causes the city to be 1 of the 10 highest-populated cities of the State in which the city is located; and
- (ii) a county with a population—
 - (I) of at least 200,000; or
 - (II) that causes the county to be 1 of the 10 highest-populated counties of the State in which the county is located.

(B) ELIGIBLE UNIT OF LOCAL GOVERNMENT-ALTERNATIVE
2.—The term “eligible unit of local government-alternative 2” means—

- (i) a city with a population of at least 50,000; or
- (ii) a county with a population of at least 200,000.

(4) INDIAN TRIBE.—The term “Indian tribe” has the meaning given the term in section 4 of the Indian Self-Determination and Education Assistance Act (25 U.S.C. 450b).

(5) PROGRAM.—The term “program” means the Energy Efficiency and Conservation Block Grant Program established under section 542(a).

(6) STATE.—The term “State” means—

- (A) a State;
- (B) the District of Columbia;
- (C) the Commonwealth of Puerto Rico; and
- (D) any other territory or possession of the United States.

SEC. 542. [42 U.S.C. 17152] ENERGY EFFICIENCY AND CONSERVATION BLOCK GRANT PROGRAM

(a) ESTABLISHMENT.—The Secretary shall establish a program, to be known as the “Energy Efficiency and Conservation Block Grant Program”, under which the Secretary shall provide grants to eligible entities in accordance with this subtitle.

(b) PURPOSE.—The purpose of the program shall be to assist eligible entities in implementing strategies—

(1) to reduce fossil fuel emissions created as a result of activities within the jurisdictions of eligible entities in a manner that—

- (A) is environmentally sustainable; and
- (B) to the maximum extent practicable, maximizes benefits for local and regional communities;

(2) to reduce the total energy use of the eligible entities; and

- (3) to improve energy efficiency in—
 - (A) the transportation sector;
 - (B) the building sector; and
 - (C) other appropriate sectors.

SEC. 543. [42 U.S.C. 17153] ALLOCATION OF FUNDS.

(a) **IN GENERAL.**—Of amounts made available to provide grants under this subtitle for each fiscal year, the Secretary shall allocate—

- (1) 34 percent to eligible units of local government—alternative 1, in accordance with subsection (b);
- (2) 34 percent to eligible units of local government—alternative 2, in accordance with subsection (b);
- (3) 28 percent to States in accordance with subsection (c);
- (4) 2 percent to Indian tribes in accordance with subsection (d); and
- (5) 2 percent for competitive grants under section 546.

(b) **ELIGIBLE UNITS OF LOCAL GOVERNMENT.**—Of amounts available for distribution to eligible units of local government under subsection (a)(1) or (2), the Secretary shall provide grants to eligible units of local government under this section based on a formula established by the Secretary according to—

- (1) the populations served by the eligible units of local government, according to the latest available decennial census; and
- (2) the daytime populations of the eligible units of local government and other similar factors (such as square footage of commercial, office, and industrial space), as determined by the Secretary.

(c) **STATES.**—Of amounts available for distribution to States under subsection (a)(2), the Secretary shall provide—

- (1) not less than 1.25 percent to each State; and
- (2) the remainder among the States, based on a formula to be established by the Secretary that takes into account—
 - (A) the population of each State; and
 - (B) any other criteria that the Secretary determines to be appropriate.

(d) **INDIAN TRIBES.**—Of amounts available for distribution to Indian tribes under subsection (a)(3), the Secretary shall establish a formula for allocation of the amounts to Indian tribes, taking into account any factors that the Secretary determines to be appropriate.

(e) **PUBLICATION OF ALLOCATION FORMULAS.**—Not later than 90 days before the beginning of each fiscal year for which grants are provided under this subtitle, the Secretary shall publish in the Federal Register the formulas for allocation established under this section.

(f) **STATE AND LOCAL ADVISORY COMMITTEE.**—The Secretary shall establish a State and local advisory committee to advise the Secretary regarding administration, implementation, and evaluation of the program.

SEC. 544. [42 U.S.C. 17154] USE OF FUNDS

An eligible entity may use a grant received under this subtitle to carry out activities to achieve the purposes of the program, including—

- (1) development and implementation of an energy efficiency and conservation strategy under section 545(b);
- (2) retaining technical consultant services to assist the eligible entity in the development of such a strategy, including—

- (A) formulation of energy efficiency, energy conservation, and energy usage goals;
- (B) identification of strategies to achieve those goals—
 - (i) through efforts to increase energy efficiency and reduce energy consumption; and
 - (ii) by encouraging behavioral changes among the population served by the eligible entity;
- (C) development of methods to measure progress in achieving the goals;
- (D) development and publication of annual reports to the population served by the eligible entity describing—
 - (i) the strategies and goals; and
 - (ii) the progress made in achieving the strategies and goals during the preceding calendar year; and
- (E) other services to assist in the implementation of the energy efficiency and conservation strategy;
- (3) conducting residential and commercial building energy audits;
- (4) establishment of financial incentive programs for energy efficiency improvements;
- (5) the provision of grants to nonprofit organizations and governmental agencies for the purpose of performing energy efficiency retrofits;
- (6) development and implementation of energy efficiency and conservation programs for buildings and facilities within the jurisdiction of the eligible entity, including—
 - (A) design and operation of the programs;
 - (B) identifying the most effective methods for achieving maximum participation and efficiency rates;
 - (C) public education;
 - (D) measurement and verification protocols; and
 - (E) identification of energy efficient technologies;
- (7) development and implementation of programs to conserve energy used in transportation, including—
 - (A) use of flex time by employers;
 - (B) satellite work centers;
 - (C) development and promotion of zoning guidelines or requirements that promote energy efficient development;
 - (D) development of infrastructure, such as bike lanes and pathways and pedestrian walkways;
 - (E) synchronization of traffic signals; and
 - (F) other measures that increase energy efficiency and decrease energy consumption;
- (8) development and implementation of building codes and inspection services to promote building energy efficiency;
- (9) application and implementation of energy distribution technologies that significantly increase energy efficiency, including—
 - (A) distributed resources; and
 - (B) district heating and cooling systems;
- (10) activities to increase participation and efficiency rates for material conservation programs, including source reduction, recycling, and recycled content procurement programs that lead to increases in energy efficiency;

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(11) the purchase and implementation of technologies to reduce, capture, and, to the maximum extent practicable, use methane and other greenhouse gases generated by landfills or similar sources;

(12) replacement of traffic signals and street lighting with energy efficient lighting technologies, including—

(A) light emitting diodes; and

(B) any other technology of equal or greater energy efficiency;

(13) development, implementation, and installation on or in any government building of the eligible entity of onsite renewable energy technology that generates electricity from renewable resources, including—

(A) solar energy;

(B) wind energy;

(C) fuel cells; and

(D) biomass;

(14) programs for financing energy efficiency, renewable energy, and zero-emission transportation (and associated infrastructure), capital investments, projects, and programs, which may include loan programs and performance contracting programs, for leveraging of additional public and private sector funds, and programs that allow rebates, grants, or other incentives for the purchase and installation of energy efficiency, renewable energy, and zero-emission transportation (and associated infrastructure) measures; and

(15) any other appropriate activity, as determined by the Secretary, in consultation with—

(A) the Administrator of the Environmental Protection Agency;

(B) the Secretary of Transportation; and

(C) the Secretary of Housing and Urban Development.

SEC. 545. [42 U.S.C. 17155] REQUIREMENTS FOR ELIGIBLE ENTITIES

(a) CONSTRUCTION REQUIREMENT.—

(1) IN GENERAL.—To be eligible to receive a grant under the program, each eligible applicant shall submit to the Secretary a written assurance that all laborers and mechanics employed by any contractor or subcontractor of the eligible entity during any construction, alteration, or repair activity funded, in whole or in part, by the grant shall be paid wages at rates not less than the prevailing wages for similar construction activities in the locality, as determined by the Secretary of Labor, in accordance with sections 3141 through 3144, 3146, and 3147 of title 40, United States Code.

(2) SECRETARY OF LABOR.—With respect to the labor standards referred to in paragraph (1), the Secretary of Labor shall have the authority and functions described in—

(A) Reorganization Plan Numbered 14 of 1950 (5 U.S.C. 903 note); and

(B) section 3145 of title 40, United States Code.

(b) ELIGIBLE UNITS OF LOCAL GOVERNMENT AND INDIAN TRIBES.—

(1) PROPOSED STRATEGY.—

(A) IN GENERAL.—Not later than 1 year after the date on which an eligible unit of local government or Indian tribe receives a grant under this subtitle, the eligible unit of local government or Indian tribe shall submit to the Secretary a proposed energy efficiency and conservation strategy in accordance with this paragraph.

(B) INCLUSIONS.—The proposed strategy under subparagraph (A) shall include—

(i) a description of the goals of the eligible unit of local government or Indian tribe, in accordance with the purposes of this subtitle, for increased energy efficiency and conservation in the jurisdiction of the eligible unit of local government or Indian tribe; and

(ii) a plan for the use of the grant to assist the eligible unit of local government or Indian tribe in achieving those goals, in accordance with section 544.

(C) REQUIREMENTS FOR ELIGIBLE UNITS OF LOCAL GOVERNMENT.—In developing the strategy under subparagraph (A), an eligible unit of local government shall—

(i) take into account any plans for the use of funds by adjacent eligible units of local governments that receive grants under the program; and

(ii) coordinate and share information with the State in which the eligible unit of local government is located regarding activities carried out using the grant to maximize the energy efficiency and conservation benefits under this subtitle.

(2) APPROVAL BY SECRETARY.—

(A) IN GENERAL.—The Secretary shall approve or disapprove a proposed strategy under paragraph (1) by not later than 120 days after the date of submission of the proposed strategy.

(B) DISAPPROVAL.—If the Secretary disapproves a proposed strategy under subparagraph (A)—

(i) the Secretary shall provide to the eligible unit of local government or Indian tribe the reasons for the disapproval; and

(ii) the eligible unit of local government or Indian tribe may revise and resubmit the proposed strategy as many times as necessary until the Secretary approves a proposed strategy.

(C) REQUIREMENT.—The Secretary shall not provide to an eligible unit of local government or Indian tribe any grant under the program until a proposed strategy of the eligible unit of local government or Indian tribe is approved by the Secretary under this paragraph.

(3) LIMITATIONS ON USE OF FUNDS.—Of amounts provided to an eligible unit of local government or Indian tribe under the program, an eligible unit of local government or Indian tribe may use—

(A) for administrative expenses, excluding the cost of meeting the reporting requirements of this subtitle, an amount equal to the greater of—

(i) 10 percent; and

- (ii) \$75,000;
 - (B) for the establishment of revolving loan funds, an amount equal to the greater of—
 - (i) 20 percent; and
 - (ii) \$250,000; and
 - (C) for the provision of subgrants to nongovernmental organizations for the purpose of assisting in the implementation of the energy efficiency and conservation strategy of the eligible unit of local government or Indian tribe, an amount equal to the greater of—
 - (i) 20 percent; and
 - (ii) \$250,000.
- (4) ANNUAL REPORT.—Not later than 2 years after the date on which funds are initially provided to an eligible unit of local government or Indian tribe under the program, and annually thereafter, the eligible unit of local government or Indian tribe shall submit to the Secretary a report describing—
 - (A) the status of development and implementation of the energy efficiency and conservation strategy of the eligible unit of local government or Indian tribe; and
 - (B) as practicable, an assessment of energy efficiency gains within the jurisdiction of the eligible unit of local government or Indian tribe.
- (c) STATES.—
 - (1) DISTRIBUTION OF FUNDS.—
 - (A) IN GENERAL.—A State that receives a grant under the program shall use not less than 60 percent of the amount received to provide subgrants to units of local government in the State that are not eligible units of local government.
 - (B) DEADLINE.—The State shall provide the subgrants required under subparagraph (A) by not later than 180 days after the date on which the Secretary approves a proposed energy efficiency and conservation strategy of the State under paragraph (3).
 - (2) REVISION OF CONSERVATION PLAN; PROPOSED STRATEGY.—Not later than 120 days after the date of enactment of this Act, each State shall—
 - (A) modify the State energy conservation plan of the State under section 362 of the Energy Policy and Conservation Act (42 U.S.C. 6322) to establish additional goals for increased energy efficiency and conservation in the State; and
 - (B) submit to the Secretary a proposed energy efficiency and conservation strategy that—
 - (i) establishes a process for providing subgrants as required under paragraph (1); and
 - (ii) includes a plan of the State for the use of funds received under the program to assist the State in achieving the goals established under subparagraph (A), in accordance with sections 542(b) and 544.
 - (3) APPROVAL BY SECRETARY.—
 - (A) IN GENERAL.—The Secretary shall approve or disapprove a proposed strategy under paragraph (2)(B) by not

later than 120 days after the date of submission of the proposed strategy.

(B) DISAPPROVAL.—If the Secretary disapproves a proposed strategy under subparagraph (A)—

(i) the Secretary shall provide to the State the reasons for the disapproval; and

(ii) the State may revise and resubmit the proposed strategy as many times as necessary until the Secretary approves a proposed strategy.

(C) REQUIREMENT.—The Secretary shall not provide to a State any grant under the program until a proposed strategy of the State is approved by the Secretary under this paragraph.

(4) LIMITATIONS ON USE OF FUNDS.—A State may use not more than 10 percent of amounts provided under the program for administrative expenses.

(5) ANNUAL REPORTS.—Each State that receives a grant under the program shall submit to the Secretary an annual report that describes—

(A) the status of development and implementation of the energy efficiency and conservation strategy of the State during the preceding calendar year;

(B) the status of the subgrant program of the State under paragraph (1);

(C) the energy efficiency gains achieved through the energy efficiency and conservation strategy of the State during the preceding calendar year; and

(D) specific energy efficiency and conservation goals of the State for subsequent calendar years.

SEC. 546. [42 U.S.C. 17156] COMPETITIVE GRANTS

(a) IN GENERAL.—Of the total amount made available for each fiscal year to carry out this subtitle, the Secretary shall use not less than 2 percent to provide grants under this section, on a competitive basis, to—

(1) units of local government (including Indian tribes) that are not eligible entities; and

(2) consortia of units of local government described in paragraph (1).

(b) APPLICATIONS.—To be eligible to receive a grant under this section, a unit of local government or consortia shall submit to the Secretary an application at such time, in such manner, and containing such information as the Secretary may require, including a plan of the unit of local government to carry out an activity described in section 544.

(c) PRIORITY.—In providing grants under this section, the Secretary shall give priority to units of local government—

(1) located in States with populations of less than 2,000,000; or

(2) that plan to carry out projects that would result in significant energy efficiency improvements or reductions in fossil fuel use.

SEC. 547. [42 U.S.C. 17157] REVIEW AND EVALUATION

(a) **IN GENERAL.**—The Secretary may review and evaluate the performance of any eligible entity that receives a grant under the program, including by conducting an audit, as the Secretary determines to be appropriate.

(b) **WITHHOLDING OF FUNDS.**—The Secretary may withhold from an eligible entity any portion of a grant to be provided to the eligible entity under the program if the Secretary determines that the eligible entity has failed to achieve compliance with—

(1) any applicable guideline or regulation of the Secretary relating to the program, including the misuse or misappropriation of funds provided under the program; or

(2) the energy efficiency and conservation strategy of the eligible entity.

SEC. 548. [42 U.S.C. 17158] FUNDING.

(a) **AUTHORIZATION OF APPROPRIATIONS.**—

(1) **GRANTS.**—There is authorized to be appropriated to the Secretary for the provision of grants under the program \$2,000,000,000 for each of fiscal years 2008 through 2012.

(2) **ADMINISTRATIVE COSTS.**—There are authorized to be appropriated to the Secretary for administrative expenses of the program—

(A) \$20,000,000 for each of fiscal years 2008 and 2009;

(B) \$25,000,000 for each of fiscal years 2010 and 2011;

and

(C) \$30,000,000 for fiscal year 2012.

(b) **MAINTENANCE OF FUNDING.**—The funding provided under this section shall supplement (and not supplant) other Federal funding provided under—

(1) a State energy conservation plan established under part D of title III of the Energy Policy and Conservation Act (42 U.S.C. 6321 et seq.); or

(2) the Weatherization Assistance Program for Low-Income Persons established under part A of title IV of the Energy Conservation and Production Act (42 U.S.C. 6861 et seq.).

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TITLE VI—ACCELERATED RESEARCH AND DEVELOPMENT

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Subtitle B—Geothermal Energy

SEC. 611. [42 U.S.C. 17191] SHORT TITLE

This subtitle may be cited as the “Advanced Geothermal Energy Research and Development Act of 2007”.

SEC. 612. DEFINITIONS

For purposes of this subtitle:

(1) **ENGINEERED.**—When referring to enhanced geothermal systems, the term “engineered” means designed to access sub-

surface heat, including stimulation and nonstimulation technologies to address one or more of the following issues:

(A) Lack of effective permeability, porosity or open fracture connectivity within the heat reservoir.

(B) Insufficient contained geofluid in the heat reservoir.

(C) A low average geothermal gradient which necessitates deeper drilling, or the use of alternative heat sources or heat generation processes.

(2) **ELIGIBLE ENTITY.**—The term “eligible entity” means any of the following entities:

(A) An institution of higher education.

(B) A National laboratory.

(C) A Federal research agency.

(D) A State research agency.

(E) A nonprofit research organization.

(F) An industrial entity.

(G) A consortium of 2 or more entities described in subparagraphs (A) through (F).

(3) **ENHANCED GEOTHERMAL SYSTEMS.**—The term “enhanced geothermal systems” means geothermal reservoir systems that are engineered, as opposed to occurring naturally.

(4) **GEOFLUID.**—The term “geofluid” means any fluid used to extract thermal energy from the Earth which is transported to the surface for direct use or electric power generation, except that such term shall not include oil or natural gas.

(5) **GEOPRESSURED RESOURCES.**—The term “geopressured resources” mean geothermal deposits found in sedimentary rocks under higher than normal pressure and saturated with gas or methane.

(6) **GEOTHERMAL.**—The term “geothermal” refers to heat energy stored in the Earth’s crust that can be accessed for direct use or electric power generation.

(7) **HYDROTHERMAL.**—The term “hydrothermal” refers to naturally occurring subsurface reservoirs of hot water or steam.

(8) **SYSTEMS APPROACH.**—The term “systems approach” means an approach to solving problems or designing systems that attempts to optimize the performance of the overall system, rather than a particular component of the system.

SEC. 613. [42 U.S.C. 17192] HYDROTHERMAL RESEARCH AND DEVELOPMENT.

(a) **IN GENERAL.**—The Secretary shall carry out a program of research, development, demonstration, and commercial application for geothermal energy production from hydrothermal systems.

(b) **PROGRAMS.**—The program authorized in subsection (a) shall include the following:

(1) **ADVANCED HYDROTHERMAL RESOURCE TOOLS.**—The research and development of advanced geologic tools to assist in locating hydrothermal resources, and to increase the reliability of site characterization, including the development of new imaging and sensing technologies and techniques to assist in prioritization of targets for characterization;

(2) EXPLORATORY DRILLING FOR GEOTHERMAL RESOURCES.—The demonstration of advanced technologies and techniques of siting and exploratory drilling for undiscovered resources in a variety of geologic settings, carried out in collaboration with industry partners that will assist in the acquisition of high quality data sets relevant for hydrothermal subsurface characterization activities.

SEC. 614. [42 U.S.C. 17193] GENERAL GEOTHERMAL SYSTEMS RESEARCH AND DEVELOPMENT.

(a) SUBSURFACE COMPONENTS AND SYSTEMS.—The Secretary shall support a program of research, development, demonstration, and commercial application of components and systems capable of withstanding geothermal environments and necessary to develop, produce, and monitor geothermal reservoirs and produce geothermal energy.

(b) ENVIRONMENTAL IMPACTS.—The Secretary shall—

(1) support a program of research, development, demonstration, and commercial application of technologies and practices designed to mitigate or preclude potential adverse environmental impacts of geothermal energy development, production or use;

(2) support a research program to identify potential environmental impacts, including induced seismicity, and environmental benefits of geothermal energy development, production, and use, and ensure that the program described in paragraph (1) addresses such impacts, including water use and effects on groundwater and local hydrology;

(3) support a program of research to compare the potential environmental impacts and environmental benefits identified as part of the development, production, and use of geothermal energy with the potential emission reductions of greenhouse gases gained by geothermal energy development, production, and use; and

(4) in carrying out this section, the Secretary shall, to the maximum extent practicable, consult with relevant federal agencies, including the Environmental Protection Agency.

(c) RESERVOIR THERMAL ENERGY STORAGE.—The Secretary shall support a program of research, development, and demonstration of reservoir thermal energy storage, emphasizing cost-effective improvements through deep direct use engineering, design, and systems research.

(d) OIL AND GAS TECHNOLOGY TRANSFER INITIATIVE.—

(1) IN GENERAL.—The Secretary shall support an initiative among the Office of Fossil Energy, the Office of Energy Efficiency and Renewable Energy, and the private sector to research, develop, and demonstrate relevant advanced technologies and operation techniques used in the oil and gas sector for use in geothermal energy development.

(2) PRIORITIES.—In carrying out paragraph (1), the Secretary shall prioritize technologies with the greatest potential to significantly increase the use and lower the cost of geothermal energy in the United States, including the cost and speed of geothermal drilling surface technologies, large- and small-scale drilling, and well construction.

(e) COPRODUCTION OF GEOTHERMAL ENERGY AND MINERALS PRODUCTION RESEARCH AND DEVELOPMENT INITIATIVE.—

(1) **IN GENERAL.**—The Secretary shall carry out a research and development initiative under which the Secretary shall provide financial assistance to demonstrate the coproduction of critical minerals from geothermal resources.

(2) **REQUIREMENTS.**—An award made under paragraph (1) shall—

(A) improve the cost effectiveness of removing minerals from geothermal brines as part of the coproduction process;

(B) increase recovery rates of the targeted mineral commodity;

(C) decrease water use and other environmental impacts, as determined by the Secretary; and

(D) demonstrate a path to commercial viability.

(f) **FLEXIBLE OPERATIONS.**—The Secretary shall support a research initiative on flexible operation of geothermal power plants.

(g) **INTEGRATED ENERGY SYSTEMS.**—The Secretary shall identify opportunities for joint research, development, and demonstration programs between geothermal systems and other energy generation or storage systems.

(h) **DRILLING DATA REPOSITORY.**—

(1) **IN GENERAL.**—The Secretary shall, in consultation with the Secretary of the Interior, establish and operate a voluntary, industry-wide repository of geothermal drilling information to lower the cost of future geothermal drilling.

(2) **REPOSITORY.**—

(A) **IN GENERAL.**—In carrying out paragraph (1), the Secretary shall collaborate with countries utilizing a significant amount of geothermal energy, as determined by the Secretary.

(B) **DATA SYSTEM.**—The repository established under paragraph (1) shall be integrated with the National Geothermal Data System.

SEC. 615. [42 U.S.C. 17194] ENHANCED GEOTHERMAL SYSTEMS RESEARCH AND DEVELOPMENT.

(a) **IN GENERAL.**—The Secretary shall support a program of research, development, demonstration, and commercial application for enhanced geothermal systems, including the programs described in subsection (b).

(b) **ENHANCED GEOTHERMAL SYSTEMS TECHNOLOGIES.**—In collaboration with industry partners, institutions of higher education, and the national laboratories, the Secretary shall support a program of research, development, demonstration, and commercial application of the technologies to achieve higher efficiency and lower cost enhanced geothermal systems, including—

(1) reservoir stimulation;

(2) drilled, non-stimulated (e.g. closed-loop) reservoir technologies;

(3) reservoir characterization, monitoring, and modeling and understanding of the surface area and volume of fractures;

(4) stress and fracture mapping including real time monitoring and modeling;

- (5) tracer development;
- (6) three and four-dimensional seismic imaging and tomography;
- (7) well placement and orientation;
- (8) long-term reservoir management;
- (9) drilling technologies, methods, and tools;
- (10) improved exploration tools;
- (11) zonal isolation; and
- (12) understanding induced seismicity risks from reservoir engineering and stimulation.

(c) FRONTIER OBSERVATORY FOR RESEARCH IN GEOTHERMAL ENERGY.—

(1) IN GENERAL.—The Secretary shall support the establishment and construction of up to 3 field research sites, which shall each be known as a “Frontier Observatory for Research in Geothermal Energy” or “FORGE” site to develop, test, and enhance techniques and tools for enhanced geothermal energy.

(2) DUTIES.—The Secretary shall—

(A) provide financial assistance in support of research and development projects focused on advanced monitoring technologies, new technologies and approaches for implementing multi-zone stimulations, nonstimulation techniques, and dynamic reservoir modeling that incorporates all available high-fidelity characterization data; and

(B) seek opportunities to coordinate efforts and share information with domestic and international partners engaged in research and development of geothermal systems and related technology, including coordination between FORGE sites.

(3) SITE SELECTION.—Of the FORGE sites referred to in paragraph (1), the Secretary shall—

(A) consider applications through a competitive, merit-reviewed process, from National Laboratories, multi-institutional collaborations, institutes of higher education and other appropriate entities best suited to provide national leadership on geothermal related issues and perform the duties enumerated under this subsection;

(B) prioritize existing field sites and facilities with capabilities relevant to the duties enumerated under this subsection;

(C) determine the mission need for and potential location of subsequent FORGE sites following the completion of construction and one year of operation of two FORGE sites; and

(D) ensure geologic diversity among FORGE sites when developing subsequent sites, to the maximum extent practicable.

(4) EXISTING FORGE SITES.—A FORGE site already in existence on the date of enactment of this Act may continue to receive support.

(5) SITE OPERATION.—

(A) INITIAL DURATION.—FORGE sites selected under paragraph (3) shall operate for an initial term of not more than 7 years after the date on which site operation begins.

(B) PERFORMANCE METRICS.—The Secretary shall establish performance metrics for each FORGE site supported under this paragraph, which may be used by the Secretary to determine whether a FORGE site should continue to receive funding.

(6) ADDITIONAL TERMS.—

(A) IN GENERAL.—At the end of an operational term described in subparagraph (B), a FORGE site may—

- (i) be transferred to other public or private entities for further enhanced geothermal testing; or
- (ii) subject to appropriations and a merit review by the Secretary, operate for an additional term of not more than 7 years.

(B) OPERATIONAL TERM DESCRIBED.—An operational term referred to in subparagraph (A)—

- (i) in the case of an existing FORGE site, is the existing operational term; and
- (ii) in the case of new FORGE sites selected under paragraph (3), is the initial term under paragraph (5)(A) or an additional term under subparagraph (A)(ii) of this paragraph.

(7) FUNDING.—

(A) IN GENERAL.—Out of funds authorized to be appropriated under section 623, there shall be made available to the Secretary to carry out the FORGE activities under this paragraph—

- (i) \$45,000,000 for fiscal year 2021;
- (ii) \$55,000,000 for fiscal year 2022;
- (iii) \$65,000,000 for fiscal year 2023;
- (iv) \$70,000,000 for fiscal year 2024; and
- (v) \$70,000,000 for fiscal year 2025.

(B) CONSIDERATIONS.—In carrying out this subsection, the Secretary shall consider the balance between funds dedicated to construction and operations and research activities to reflect the state of site development.

(d) ENHANCED GEOTHERMAL SYSTEMS DEMONSTRATIONS.—

(1) IN GENERAL.—Beginning on the date of enactment of this section, the Secretary, in collaboration with industry partners, institutions of higher education, and the national laboratories, shall support an initiative for demonstration of enhanced geothermal systems for power production or direct use.

(2) PROJECTS.—

(A) IN GENERAL.—Under the initiative described in paragraph (1), 4 demonstration projects shall be carried out in locations that are potentially commercially viable for enhanced geothermal systems development, while also considering environmental impacts to the maximum extent practicable, as determined by the Secretary.

(B) REQUIREMENTS.—Demonstration projects under subparagraph (A) shall—

- (i) collectively demonstrate—
 - (I) different geologic settings, such as hot sedimentary aquifers, layered geologic systems,

supercritical systems, and basement rock systems; and

(II) a variety of development techniques, including open hole and cased hole completions, differing well orientations, and stimulation and non-stimulation mechanisms; and

(ii) to the extent practicable, use existing sites where subsurface characterization or geothermal energy integration analysis has been conducted.

(C) EASTERN DEMONSTRATION.—Not fewer than 1 of the demonstration projects carried out under subparagraph (A) shall be located in an area east of the Mississippi River that is suitable for enhanced geothermal demonstration for power, heat, or a combination of power and heat.

(D) MILESTONE-BASED DEMONSTRATION PROJECTS.—The Secretary may carry out demonstration projects under this subsection as a milestone-based demonstration project under section 9005 of the Energy Act of 2020.

(3) FUNDING.—Out of funds authorized to be appropriated under section 623, there shall be made available to the Secretary to carry out the demonstration activities under this subsection \$21,000,000 for each of fiscal years 2021 through 2025.

SEC. 616. [42 U.S.C. 17195] GEOTHERMAL ENERGY PRODUCTION FROM OIL AND GAS FIELDS AND RECOVERY AND PRODUCTION OF GEOPRESSURED GAS RESOURCES

(a) IN GENERAL.—The Secretary shall establish a program of research, development, demonstration, and commercial application to support development of geothermal energy production from oil and gas fields and production and recovery of energy, including electricity, from geopressured resources. In addition, the Secretary shall conduct such supporting activities including research, resource characterization, and technology development as necessary.

(b) GEOTHERMAL ENERGY PRODUCTION FROM OIL AND GAS FIELDS.—The Secretary shall implement a grant program in support of geothermal energy production from oil and gas fields. The program shall include grants for a total of not less than three demonstration projects of the use of geothermal techniques such as advanced organic rankine cycle systems at marginal, unproductive, and productive oil and gas wells. The Secretary shall, to the extent practicable and in the public interest, make awards that—

(1) include not less than five oil or gas well sites per project award;

(2) use a range of oil or gas well hot water source temperatures from 150 degrees Fahrenheit to 300 degrees Fahrenheit;

(3) cover a range of sizes up to one megawatt;

(4) are located at a range of sites;

(5) can be replicated at a wide range of sites;

(6) facilitate identification of optimum techniques among competing alternatives;

(7) include business commercialization plans that have the potential for production of equipment at high volumes and operation and support at a large number of sites; and

(8) satisfy other criteria that the Secretary determines are necessary to carry out the program and collect necessary data and information.

The Secretary shall give preference to assessments that address multiple elements contained in paragraphs (1) through (8).

(c) GRANT AWARDS.—Each grant award for demonstration of geothermal technology such as advanced organic rankine cycle systems at oil and gas wells made by the Secretary under subsection (b) shall include—

- (1) necessary and appropriate site engineering study;
- (2) detailed economic assessment of site specific conditions;
- (3) appropriate feasibility studies to determine whether the demonstration can be replicated;
- (4) design or adaptation of existing technology for site specific circumstances or conditions;
- (5) installation of equipment, service, and support;
- (6) operation for a minimum of 1 year and monitoring for the duration of the demonstration; and
- (7) validation of technical and economic assumptions and documentation of lessons learned.

(d) GEOPRESSURED GAS RESOURCE RECOVERY AND PRODUCTION.—(1) The Secretary shall implement a program to support the research, development, demonstration, and commercial application of cost-effective techniques to produce energy from geopressured resources.

(2) The Secretary shall solicit preliminary engineering designs for geopressured resources production and recovery facilities.

(3) Based upon a review of the preliminary designs, the Secretary shall award grants, which may be cost-shared, to support the detailed development and completion of engineering, architectural and technical plans needed to support construction of new designs.

(4) Based upon a review of the final design plans above, the Secretary shall award cost-shared development and construction grants for demonstration geopressured production facilities that show potential for economic recovery of the heat, kinetic energy and gas resources from geopressured resources.

(e) COMPETITIVE GRANT SELECTION.—Not less than 90 days after the date of the enactment of this Act, the Secretary shall conduct a national solicitation for applications for grants under the programs outlined in subsections (b) and (d). Grant recipients shall be selected on a competitive basis based on criteria in the respective subsection.

(f) WELL DRILLING.—No funds may be used under this section for the purpose of drilling new wells.

SEC. 616A. [42 U.S.C. 17195a] GEOTHERMAL HEAT PUMPS AND DIRECT USE RESEARCH AND DEVELOPMENT.

(a) PURPOSES.—The purposes of this section are—

- (1) to improve the understanding of related earth sciences, components, processes, and systems used for geothermal heat pumps and the direct use of geothermal energy; and
- (2) to increase the energy efficiency, lower the cost, increase the use, and improve and demonstrate the effectiveness

of geothermal heat pumps and the direct use of geothermal energy.

(b) DEFINITIONS.—In this section:

(1) DIRECT USE OF GEOTHERMAL ENERGY.—The term “direct use of geothermal energy” means geothermal systems that use water directly or through a heat exchanger to provide—

(A) heating and cooling to buildings, commercial districts, residential communities, and large municipal, or industrial projects; or

(B) heat required for industrial processes, agriculture, aquaculture, and other facilities.

(2) ECONOMICALLY DISTRESSED AREA.—The term “economically distressed area” means an area described in section 301(a) of the Public Works and Economic Development Act of 1965 (42 U.S.C. 3161(a)).

(3) GEOTHERMAL HEAT PUMP.—The term “geothermal heat pump” means a system that provides heating and cooling by exchanging heat from shallow geology, groundwater, or surface water using—

(A) a closed loop system, which transfers heat by way of buried or immersed pipes that contain a mix of water and working fluid; or

(B) an open loop system, which circulates ground or surface water directly into the building and returns the water to the same aquifer or surface water source.

(c) PROGRAM.—

(1) IN GENERAL.—The Secretary shall support within the Geothermal Technologies Office a program of research, development, and demonstration for geothermal heat pumps and the direct use of geothermal energy.

(2) AREAS.—The program under paragraph (1) may include research, development, demonstration, and commercial application of—

(A) geothermal ground loop efficiency improvements, cost reductions, and improved installation and operations methods;

(B) the use of geothermal energy for building-scale energy storage;

(C) the use of geothermal energy as a grid management resource or seasonal energy storage;

(D) geothermal heat pump efficiency improvements;

(E) the use of alternative fluids as a heat exchange medium, such as hot water found in mines and mine shafts, graywater, or other fluids that may improve the economics of geothermal heat pumps;

(F) heating of districts, neighborhoods, communities, large commercial or public buildings, and industrial and manufacturing facilities;

(G) the use of low temperature groundwater for direct use; and

(H) system integration of direct use with geothermal electricity production.

(3) ENVIRONMENTAL IMPACTS.—In carrying out the program, the Secretary shall identify and mitigate potential environmental impacts in accordance with section 614(b).

(d) FINANCIAL ASSISTANCE.—

(1) IN GENERAL.—The Secretary shall carry out the program established in subsection (c) by making financial assistance available to State, local, and Tribal governments, institutions of higher education, nonprofit entities, National Laboratories, utilities, and for-profit companies.

(2) PRIORITY.—In providing financial assistance under this subsection, the Secretary may give priority to proposals that apply to large buildings, commercial districts, and residential communities that are located in economically distressed areas and areas that the Secretary determines to have high economic potential for geothermal district heating based on the report, “Geovision: Harnessing the Heat Beneath our Feet” published by the Department in 2019, or a successor report.

SEC. 617. [42 U.S.C. 17196] ORGANIZATION AND ADMINISTRATION OF PROGRAMS.

(a) FEDERAL SHARE.—The Federal share of costs of projects funded under this subtitle shall be in accordance with section 988 of the Energy Policy Act of 2005.

(b) ORGANIZATION AND ADMINISTRATION OF PROGRAMS.—Programs under this subtitle shall incorporate the following elements:

(1) The Secretary shall coordinate with, and where appropriate may provide funds in furtherance of the purposes of this subtitle to, other Department of Energy research and development programs focused on drilling, subsurface characterization, and other related technologies.

(2) The Secretary shall coordinate and consult with the appropriate Federal land management agencies in selecting proposals for funding under this subtitle.

(3) Nothing in this subtitle shall be construed to alter or affect any law relating to the management or protection of Federal lands.

(c) EDUCATION AND OUTREACH.—In carrying out the activities described in this subtitle, the Secretary shall support education and outreach activities to disseminate information on geothermal energy technologies and the geothermal energy workforce, including activities at the Frontier Observatory for Research in Geothermal Energy site or sites.

(d) TECHNICAL ASSISTANCE.—In carrying out this subtitle, the Secretary shall also conduct technical assistance and analysis activities with eligible entities for the purpose of supporting the commercial application of advances in geothermal energy systems development and operations, which may include activities that support expanding access to advanced geothermal energy technologies for rural, Tribal, and low-income communities.

(e) REPORT.—Every 5 years after the date of enactment of this subsection, the Secretary shall report to the Committee on Science and Technology of the House of Representatives and the Committee on Energy and Natural Resources of the Senate on advanced concepts and technologies to maximize the geothermal resource potential of the United States.

(f) **PROGRESS REPORTS.**—Not later than 1 year after the date of enactment of this subsection, and every 2 years thereafter, the Secretary shall submit to the Committee on Science and Technology of the House of Representatives and the Committee on Energy and Natural Resources of the Senate a report on the results of projects undertaken under this part and other such information the Secretary considers appropriate.

SEC. 618. [42 U.S.C. 17197] ADVANCED GEOTHERMAL COMPUTING AND DATA SCIENCE RESEARCH AND DEVELOPMENT.

(a) **IN GENERAL.**—The Secretary shall carry out a program of research and development of advanced computing and data science tools for geothermal energy.

(b) **PROGRAMS.**—The program authorized in subsection (a) shall include the following:

(1) **ADVANCED COMPUTING FOR GEOTHERMAL SYSTEMS TECHNOLOGIES.**—Research, development, and demonstration of technologies to develop advanced data, machine learning, artificial intelligence, and related computing tools to assist in locating geothermal resources, to increase the reliability of site characterization, to increase the rate and efficiency of drilling, to improve induced seismicity mitigation, and to support enhanced geothermal systems technologies.

(2) **GEOTHERMAL SYSTEMS RESERVOIR MODELING.**—Research, development, and demonstration of models of geothermal reservoir performance and enhanced geothermal systems reservoir stimulation technologies and techniques, with an emphasis on accurately modeling fluid and heat flow, permeability evolution, geomechanics, geochemistry, seismicity, and operational performance over time, including collaboration with industry and field validation.

(c) **COORDINATION.**—In carrying out these programs, the Secretary shall ensure coordination and consultation with the Department of Energy's Office of Science. The Secretary shall ensure, to the maximum extent practicable, coordination of these activities with the Department of Energy National Laboratories, institutes of higher education, and the private sector.

SEC. 619. [42 U.S.C. 17198] GEOTHERMAL WORKFORCE DEVELOPMENT.

The Secretary shall support the development of a geothermal energy workforce through a program that—

(1) facilitates collaboration between university students and researchers at the National Laboratories; and

(2) prioritizes science in areas relevant to the mission of the Department through the application of geothermal energy tools and technologies.

[Sections 620 and 621 were struck by section 3002(i)(1) of division Z of Public Law 116-260.]

SEC. 622. [42 U.S.C. 17201] APPLICABILITY OF OTHER LAWS

Nothing in this subtitle shall be construed as waiving, modifying, or superseding the applicability of any requirement under any environmental or other Federal or State law. To the extent that activities authorized in this subtitle take place in coastal and ocean areas, the Secretary shall consult with the Secretary of Com-

merce, acting through the Under Secretary of Commerce for Oceans and Atmosphere, regarding the potential marine environmental impacts and measures to address such impacts.

SEC. 623. [42 U.S.C. 17202] AUTHORIZATION OF APPROPRIATIONS.

There are authorized to be appropriated to the Secretary to carry out the programs under this subtitle \$170,000,000 for each of fiscal years 2021 through 2025.

SEC. 624. [42 U.S.C. 17203] INTERNATIONAL GEOTHERMAL ENERGY DEVELOPMENT

(a) **IN GENERAL.**—The Secretary of Energy, in coordination with other appropriate Federal and multilateral agencies (including the United States Agency for International Development) shall support collaborative efforts with international partners to promote the research, development, and demonstration of geothermal technologies used to develop hydrothermal and enhanced geothermal system resources.

(b) **UNITED STATES TRADE AND DEVELOPMENT AGENCY.**—The Director of the United States Trade and Development Agency may—

- (1) encourage participation by United States firms in actions taken to carry out subsection (a); and
- (2) provide grants and other financial support for feasibility and resource assessment studies conducted in, or intended to benefit, less developed countries.

SEC. 625. [42 U.S.C. 17204] HIGH COST REGION GEOTHERMAL ENERGY GRANT PROGRAM

(a) **DEFINITIONS.**—In this section:

(1) **ELIGIBLE ENTITY.**—The term “eligible entity” means—

- (A) a utility;
- (B) an electric cooperative;
- (C) a State;
- (D) a political subdivision of a State;
- (E) an Indian tribe; or
- (F) a Native corporation.

(2) **HIGH-COST REGION.**—The term “high-cost region” means a region in which the average cost of electrical power or heat exceeds 150 percent of the national average retail cost, as determined by the Secretary.

(b) **PROGRAM.**—The Secretary shall use amounts made available to carry out this section to make grants to eligible entities for activities described in subsection (c).

(c) **ELIGIBLE ACTIVITIES.**—An eligible entity may use grant funds under this section, with respect to a geothermal energy project in a high-cost region, only—

- (1) to conduct a feasibility study, including a study of exploration, geochemical testing, geomagnetic surveys, geologic information gathering, baseline environmental studies, well drilling, resource characterization, permitting, and economic analysis;
- (2) for design and engineering costs, relating to the project; and

(3) to demonstrate and promote commercial application of technologies related to geothermal energy as part of the project.

(d) **COST SHARING.**—The cost-sharing requirements of section 988 of the Energy Policy Act of 2005 (42 U.S.C. 16352) shall apply to any project carried out under this section.

(e) **AUTHORIZATION OF APPROPRIATIONS.**—Out of funds authorized under section 623, there is authorized to be appropriated to carry out this section \$5,000,000 for each of fiscal years 2021 through 2025.

Subtitle C—Water Power Research and Development

SEC. 632. [42 U.S.C. 17211] DEFINITIONS.

In this subtitle:

(1) **ELIGIBLE ENTITY.**—The term “eligible entity” means any of the following entities:

- (A) An institution of higher education.
- (B) A National Laboratory.
- (C) A Federal research agency.
- (D) A State research agency.
- (E) A nonprofit research organization.
- (F) An industrial entity or a multi-institutional consortium thereof.

(2) **INSTITUTION OF HIGHER EDUCATION.**—The term “institution of higher education” means—

- (A) an institution of higher education (as defined in section 101(a) of the Higher Education Act of 1965 (20 U.S.C. 1001(a))); or
- (B) a postsecondary vocational institution (as defined in section 102(c) of the Higher Education Act of 1965 (20 U.S.C. 1002(c))).

(3) **MARINE ENERGY.**—The term “marine energy” means energy from—

- (A) waves, tides, and currents in oceans, estuaries, and tidal areas;
- (B) free flowing water in rivers, lakes, streams, and man-made channels;
- (C) differentials in salinity and pressure gradients; and
- (D) differentials in water temperature, including ocean thermal energy conversion.

(4) **NATIONAL LABORATORY.**—The term “National Laboratory” has the meaning given such term in section 2(3) of the Energy Policy Act of 2005 (42 U.S.C. 15801(3)).

(5) **WATER POWER.**—The term “water power” refers to hydropower, including conduit power, pumped storage, and marine energy technologies.

(6) **MICROGRID.**—The term “microgrid” has the meaning given such term in section 641 of the Energy Independence and Security Act of 2007 (42 U.S.C. 17231).

SEC. 633. [42 U.S.C. 17212] WATER POWER TECHNOLOGY RESEARCH, DEVELOPMENT, AND DEMONSTRATION.

The Secretary shall carry out a program to conduct research, development, demonstration, and commercial application of water power technologies in support of each of the following purposes:

- (1) To promote research, development, demonstration, and commercial application of water power generation technologies in order to increase capacity and reduce the cost of those technologies.
- (2) To promote research and development to improve the environmental impact of water power technologies.
- (3) To provide grid reliability and resilience, including through technologies that facilitate new market opportunities, such as ancillary services, for water power.
- (4) To promote the development of water power technologies to improve economic growth and enhance cross-institutional foundational workforce development in the water power sector, including in coastal communities.

SEC. 634. [42 U.S.C. 17213] HYDROPOWER RESEARCH, DEVELOPMENT, AND DEMONSTRATION.

The Secretary shall conduct a program of research, development, demonstration, and commercial application for technologies that improve the capacity, efficiency, resilience, security, reliability, affordability, and environmental impact, including potential cumulative environmental impacts, of hydropower systems. In carrying out such program, the Secretary shall prioritize activities designed to—

- (1) develop technology for—
 - (A) non-powered dams, including aging and potentially hazardous dams;
 - (B) pumped storage;
 - (C) constructed waterways;
 - (D) new stream-reach development;
 - (E) modular and small dams;
 - (F) increased operational flexibility; and
 - (G) enhancement of relevant existing facilities;
- (2) develop new strategies and technologies, including analytical methods, physical and numerical tools, and advanced computing, as well as methods to validate such methods and tools, in order to—
 - (A) extend the operational lifetime of hydropower systems and their physical structures, while improving environmental impact, including potential cumulative environmental impacts;
 - (B) assist in device and system design, installation, operation, and maintenance; and
 - (C) reduce costs, limit outages, and increase unit and plant efficiencies, including by examining the impact of changing water and electricity demand on hydropower generation, flexibility, and provision of grid services;
- (3) study, in conjunction with other relevant Federal agencies as appropriate, methods to improve the hydropower licensing process, including by compiling current and accepted best

practices, public comments, and methodologies to assess the full range of potential environmental and economic impacts;

(4) identify opportunities for joint research, development, and demonstration programs between hydropower systems, which may include—

(A) pumped storage systems and other renewable energy systems;

(B) small hydro facilities and other energy storage systems;

(C) other hybrid energy systems;

(D) small hydro facilities and critical infrastructure, including water infrastructure; and

(E) hydro facilities and responsive load technologies, which may include smart buildings and city systems;

(5) improve the reliability of hydropower technologies, including during extreme weather events;

(6) develop methods and technologies to improve environmental impact, including potential cumulative environmental impacts, of hydropower and pumped storage technologies, including potential impacts on wildlife, such as—

(A) fisheries;

(B) aquatic life and resources;

(C) navigation of waterways; and

(D) upstream and downstream environmental conditions, including sediment movement, water quality, and flow volumes;

(7) identify ways to increase power generation by—

(A) diversifying plant configuration options;

(B) improving pump-back efficiencies;

(C) investigating multi-phase systems;

(D) developing, testing, and monitoring advanced generators with faster cycling times, variable speeds, and improved efficiencies;

(E) developing, testing, and monitoring advanced turbines capable of improving environmental impact, including potential cumulative environmental impacts, including small turbine designs;

(F) developing standardized powertrain components;

(G) developing components with advanced materials and manufacturing processes, including additive manufacturing; and

(H) developing analytical tools that enable hydropower to provide grid services that, amongst other services, improve grid integration of other energy sources;

(8) advance new pumped storage technologies, including—

(A) systems with adjustable speed and other new pumping and generating equipment designs;

(B) modular systems;

(C) alternative closed-loop systems, including mines and quarries; and

(D) other innovative equipment and materials as determined by the Secretary;

(9) reduce civil works costs and construction times for hydropower and pumped storage systems, including comprehen-

sive data and systems analysis of hydropower and pumped storage construction technologies and processes in order to identify areas for whole-system efficiency gains;

(10) advance efficient and reliable integration of hydropower and pumped storage systems with the electric grid by—

(A) improving methods for operational forecasting of renewable energy systems to identify opportunities for hydropower applications in pumped storage and hybrid energy systems, including forecasting of seasonal and annual energy storage;

(B) considering aggregating small distributed hydropower assets; and

(C) identifying barriers to grid scale implementation of hydropower and pumped storage technologies;

(11) improve computational fluid dynamic modeling methods;

(12) improve flow measurement methods, including maintenance of continuous flow measurement equipment;

(13) identify best methods for compiling data on all hydropower resources and assets, including identifying potential for increased capacity; and

(14) identify mechanisms to test and validate performance of hydropower and pumped storage technologies.

SEC. 635. [42 U.S.C. 17214] MARINE ENERGY RESEARCH, DEVELOPMENT, AND DEMONSTRATION.

(a) IN GENERAL.—The Secretary, in consultation with the Secretary of Defense, Secretary of Commerce (acting through the Under Secretary of Commerce for Oceans and Atmosphere) and other relevant Federal agencies, shall conduct a program of research, development, demonstration, and commercial application of marine energy technology, including activities to—

(1) assist technology development to improve the components, processes, and systems used for power generation from marine energy resources at a variety of scales;

(2) establish and expand critical testing infrastructure and facilities necessary to—

(A) demonstrate and prove marine energy devices at a range of scales in a manner that is cost-effective and efficient; and

(B) accelerate the technological readiness and commercial application of such devices;

(3) address marine energy resource variability issues, including through the application of energy storage technologies;

(4) advance efficient and reliable integration of marine energy with the electric grid, which may include smart building systems;

(5) identify and study critical short-term and long-term needs to maintaining a sustainable marine energy supply chain based in the United States;

(6) increase the reliability, security, and resilience of marine energy technologies;

(7) validate the performance, reliability, maintainability, and cost of marine energy device designs and system components in an operating environment;

(8) consider the protection of critical infrastructure, such as adequate separation between marine energy devices and submarine telecommunications cables, including through the development of voluntary, consensus-based standards for such purposes;

(9) identify opportunities for crosscutting research, development, and demonstration programs between existing energy research programs;

(10) identify and improve, in conjunction with the Secretary of Commerce, acting through the Under Secretary of Commerce for Oceans and Atmosphere, and other relevant Federal agencies as appropriate, the environmental impact, including potential cumulative environmental impacts, of marine energy technologies, including—

(A) potential impacts on fisheries and other marine resources; and

(B) developing technologies, including mechanisms for self-evaluation, and other means available for improving environmental impact, including potential cumulative environmental impacts;

(11) identify, in consultation with relevant Federal agencies, potential navigational impacts of marine energy technologies and strategies to prevent possible adverse impacts, in addition to opportunities for marine energy systems to aid the United States Coast Guard, such as remote sensing for coastal border security;

(12) develop numerical and physical tools, including models and monitoring technologies, to assist industry in device and system design, installation, operation, and maintenance, including methods to validate such tools;

(13) support materials science as it relates to marine energy technology, such as the development of corrosive-resistant materials;

(14) improve marine energy resource forecasting and general understanding of aquatic system behavior, including turbulence and extreme conditions;

(15) develop metrics and voluntary, consensus-based standards, in coordination with the National Institute of Standards and Technology and appropriate standard development organizations, for marine energy components, systems, and projects, including—

(A) measuring performance of marine energy technologies; and

(B) characterizing environmental conditions;

(16) enhance integration with hybrid energy systems, including desalination;

(17) identify opportunities to integrate marine energy technologies into new and existing infrastructure; and

(18) to develop technology necessary to support the use of marine energy—

(A) for the generation and storage of power at sea; and

(B) for the generation and storage of power to promote the resilience of coastal communities, including in applications relating to—

- (i) desalination;
- (ii) disaster recovery and resilience; and
- (iii) community microgrids in isolated power systems.

(b) **STUDY OF NON-POWER SECTOR APPLICATIONS FOR ADVANCED MARINE ENERGY TECHNOLOGIES.**—

(1) **IN GENERAL.**—The Secretary, in consultation with the Secretary of Transportation and the Secretary of Commerce, shall conduct a study to examine opportunities for research and development in advanced marine energy technologies for non-power sector applications, including applications with respect to—

- (A) the maritime transportation sector;
- (B) associated maritime energy infrastructure, including infrastructure that serves ports, to improve system resilience and disaster recovery; and
- (C) enabling scientific missions at sea and in extreme environments, including the Arctic.

(2) **REPORT.**—Not later than 1 year after the date of enactment of this section, the Secretary shall submit to the Committee on Energy and Natural Resources of the Senate and the Committee on Science, Space, and Technology of the House of Representatives a report that describes the results of the study conducted under paragraph (1).

SEC. 636. [42 U.S.C. 17215] NATIONAL MARINE ENERGY CENTERS.

(a) **IN GENERAL.**—The Secretary shall award grants, each such grant up to \$10,000,000 per year, to institutions of higher education (or consortia thereof) for—

- (1) the continuation and expansion of the research, development, demonstration, testing, and commercial application activities at the National Marine Energy Centers (referred to in this section as “Centers”) established as of January 1, 2020; and
- (2) the establishment of new National Marine Energy Centers.

(b) **LOCATION SELECTION.**—In selecting institutions of higher education for new Centers, the Secretary shall consider the following criteria:

- (1) Whether the institution hosts an existing marine energy research and development program.
- (2) Whether the institution has proven technical expertise to support marine energy research.
- (3) Whether the institution has access to marine resources.

(c) **PURPOSES.**—The Centers shall coordinate among themselves, the Department, and National Laboratories to—

- (1) advance research, development, demonstration, and commercial application of marine energy technologies in response to industry and commercial needs;
- (2) support in-water testing and demonstration of marine energy technologies, including facilities capable of testing—
 - (A) marine energy systems of various technology readiness levels and scales;

- (B) a variety of technologies in multiple test berths at a single location;
- (C) arrays of technology devices; and
- (D) interconnectivity to an electrical grid, including microgrids; and
- (3) collect and disseminate information on best practices in all areas relating to developing and managing marine energy resources and energy systems.
- (d) COORDINATION.—To the extent practicable, the Centers shall coordinate their activities with the Secretary of Commerce, acting through the Undersecretary of Commerce for Oceans and Atmosphere, and other relevant Federal agencies.
- (e) TERMINATION.—To the extent otherwise authorized by law, the Secretary may terminate funding for a Center described in paragraph (a) if such Center is under-performing.

SEC. 637. [42 U.S.C. 17216] ORGANIZATION AND ADMINISTRATION OF PROGRAMS.

(a) COORDINATION.—In carrying out this subtitle, the Secretary shall coordinate activities, and effectively manage cross-cutting research priorities across programs of the Department and other relevant Federal agencies, including the National Laboratories and the National Marine Energy Centers.

(b) COLLABORATION.—

(1) IN GENERAL.—In carrying out this subtitle, the Secretary shall collaborate with industry, National Laboratories, other relevant Federal agencies, institutions of higher education, including Minority Serving Institutions, National Marine Energy Centers, Tribal entities, including Alaska Native Corporations, and international bodies with relevant scientific and technical expertise.

(2) PARTICIPATION.—To the extent practicable, the Secretary shall encourage research projects that promote collaboration between entities specified in paragraph (1) and include entities not historically associated with National Marine Energy Centers, such as Minority Serving Institutions.

(3) INTERNATIONAL COLLABORATION.—The Secretary, in coordination with other appropriate Federal and multilateral agencies (including the United States Agency for International Development) shall support collaborative efforts with international partners to promote the research, development, and demonstration of water power technologies used to develop hydropower, pump storage, and marine energy resources.

(c) DISSEMINATION OF RESULTS AND PUBLIC AVAILABILITY.—The Secretary shall—

(1) publish the results of projects supported under this subtitle through Department websites, reports, databases, training materials, and industry conferences, including information discovered after the completion of such projects, withholding any industrial proprietary information; and

(2) share results of such projects with the public except to the extent that the information is protected from disclosure under section 552(b) of title 5, United States Code.

(d) AWARD FREQUENCY.—The Secretary shall solicit applications for awards under this subtitle no less frequently than once per fiscal year.

(e) EDUCATION AND OUTREACH.—In carrying out the activities described in this subtitle, the Secretary shall support education and outreach activities to disseminate information and promote public understanding of water power technologies and the water power workforce, including activities at the National Marine Energy Centers.

(f) TECHNICAL ASSISTANCE AND WORKFORCE DEVELOPMENT.—In carrying out this subtitle, the Secretary may also conduct, for purposes of supporting technical, non-hardware, and information-based advances in water power systems development and operations—

(1) technical assistance and analysis activities with eligible entities, including activities that support expanding access to advanced water power technologies for rural, Tribal, and low-income communities; and

(2) workforce development and training activities, including to support the dissemination of standards and best practices for enabling water power production.

(g) STRATEGIC PLAN.—In carrying out the activities described in this subtitle, the Secretary shall—

(1) not later than one year after the date of the enactment of the Energy Act of 2020, draft a plan, considering input from relevant stakeholders such as industry and academia, to implement the programs described in this subtitle and update the plan on an annual basis; and

(2) the plan shall address near-term (up to 2 years), mid-term (up to 7 years), and long-term (up to 15 years) challenges to the advancement of water power systems.

(h) REPORT TO CONGRESS.—Not later than 1 year after the date of the enactment of the Energy Act of 2020, and at least once every 2 years thereafter, the Secretary shall provide, and make available to the public and the relevant authorizing and appropriations committees of Congress, a report on the findings of research conducted and activities carried out pursuant to this subtitle, including the most current strategic plan under subsection (g) and the progress made in implementing such plan.

SEC. 638. [42 U.S.C. 17217] APPLICABILITY OF OTHER LAWS.

Nothing in this subtitle shall be construed as waiving, modifying, or superseding the applicability of any requirement under any environmental or other Federal or State law.

SEC. 639. [42 U.S.C. 17218] AUTHORIZATION OF APPROPRIATIONS.

There are authorized to be appropriated to the Secretary to carry out this subtitle \$186,600,000 for each of fiscal years 2021 through 2025, including \$137,428,378 for marine energy and \$49,171,622 for hydropower research, development, and demonstration activities.

Subtitle D—Energy Storage for Transportation and Electric Power

* * * * *

SEC. 641. [42 U.S.C. 17231] ENERGY STORAGE COMPETITIVENESS.

(a) **SHORT TITLE.**—This section may be cited as the “United States Energy Storage Competitiveness Act of 2007”.

(b) **DEFINITIONS.**—In this section:

(1) **COUNCIL.**—The term “Council” means the Energy Storage Advisory Council established under subsection (e).

(2) **COMPRESSED AIR ENERGY STORAGE.**—The term “compressed air energy storage” means, in the case of an electricity grid application, the storage of energy through the compression of air.

(3) **ELECTRIC DRIVE VEHICLE.**—The term “electric drive vehicle” means—

(A) a vehicle that uses an electric motor for all or part of the motive power of the vehicle, including battery electric, hybrid electric, plug-in hybrid electric, fuel cell, and plug-in fuel cell vehicles and rail transportation vehicles; or

(B) mobile equipment that uses an electric motor to replace an internal combustion engine for all or part of the work of the equipment.

(4) **ISLANDING.**—The term “islanding” means a distributed generator or energy storage device continuing to power a location in the absence of electric power from the primary source.

(5) **FLYWHEEL.**—The term “flywheel” means, in the case of an electricity grid application, a device used to store rotational kinetic energy.

(6) **MICROGRID.**—The term “microgrid” means an integrated energy system consisting of interconnected loads and distributed energy resources (including generators and energy storage devices), which as an integrated system can operate in parallel with the utility grid or in an intentional islanding mode.

(7) **SELF-HEALING GRID.**—The term “self-healing grid” means a grid that is capable of automatically anticipating and responding to power system disturbances (including the isolation of failed sections and components), while optimizing the performance and service of the grid to customers.

(8) **SPINNING RESERVE SERVICES.**—The term “spinning reserve services” means a quantity of electric generating capacity in excess of the quantity needed to meet peak electric demand.

(9) **ULTRACAPACITOR.**—The term “ultracapacitor” means an energy storage device that has a power density comparable to a conventional capacitor but is capable of exceeding the energy density of a conventional capacitor by several orders of magnitude.

(c) **PROGRAM.**—The Secretary shall carry out a research, development, and demonstration program to support the ability of the United States to remain globally competitive in energy storage sys-

tems for electric drive vehicles, stationary applications, and electricity transmission and distribution.

(d) COORDINATION.—In carrying out the activities of this section, the Secretary shall coordinate relevant efforts with appropriate Federal agencies, including the Department of Transportation.

(e) ENERGY STORAGE ADVISORY COUNCIL.—

(1) ESTABLISHMENT.—Not later than 90 days after the date of enactment of this Act, the Secretary shall establish an Energy Storage Advisory Council.

(2) COMPOSITION.—

(A) IN GENERAL.—Subject to subparagraph (B), the Council shall consist of not less than 15 individuals appointed by the Secretary, based on recommendations of the National Academy of Sciences.

(B) ENERGY STORAGE INDUSTRY.—The Council shall consist primarily of representatives of the energy storage industry of the United States.

(C) CHAIRPERSON.—The Secretary shall select a Chairperson for the Council from among the members appointed under subparagraph (A).

(3) MEETINGS.—

(A) IN GENERAL.—The Council shall meet not less than once a year.

(B) CHAPTER 10 OF TITLE 5, UNITED STATES CODE.—Chapter 10 of title 5, United States Code, shall apply to a meeting of the Council.

(4) PLANS.—No later than 1 year after the date of enactment of this Act and every 5 years thereafter, the Council, in conjunction with the Secretary, shall develop a 5-year plan for integrating basic and applied research so that the United States retains a globally competitive domestic energy storage industry for electric drive vehicles, stationary applications, and electricity transmission and distribution.

(5) REVIEW.—The Council shall—

(A) assess, every 2 years, the performance of the Department in meeting the goals of the plans developed under paragraph (4); and

(B) make specific recommendations to the Secretary on programs or activities that should be established or terminated to meet those goals.

(f) BASIC RESEARCH PROGRAM.—

(1) BASIC RESEARCH.—The Secretary shall conduct a basic research program on energy storage systems to support electric drive vehicles, stationary applications, and electricity transmission and distribution, including—

(A) materials design;

(B) materials synthesis and characterization;

(C) electrode-active materials, including electrolytes and bioelectrolytes;

(D) surface and interface dynamics;

(E) modeling and simulation; and

(F) thermal behavior and life degradation mechanisms.

(2) NANOSCIENCE CENTERS.—The Secretary, in cooperation with the Council, shall coordinate the activities of the nanoscience centers of the Department to help the energy storage research centers of the Department maintain a globally competitive posture in energy storage systems for electric drive vehicles, stationary applications, and electricity transmission and distribution.

(3) FUNDING.—For activities carried out under this subsection, in addition to funding activities at National Laboratories, the Secretary shall award funds to, and coordinate activities with, a range of stakeholders including the public, private, and academic sectors.

(g) APPLIED RESEARCH PROGRAM.—

(1) IN GENERAL.—The Secretary shall conduct an applied research program on energy storage systems to support electric drive vehicles, stationary applications, and electricity transmission and distribution technologies, including—

- (A) ultracapacitors;
- (B) flywheels;
- (C) batteries and battery systems (including flow batteries);
- (D) compressed air energy systems;
- (E) power conditioning electronics;
- (F) manufacturing technologies for energy storage systems;
- (G) thermal management systems; and
- (H) hydrogen as an energy storage medium.

(2) FUNDING.—For activities carried out under this subsection, in addition to funding activities at National Laboratories, the Secretary shall provide funds to, and coordinate activities with, a range of stakeholders, including the public, private, and academic sectors.

(h) ENERGY STORAGE RESEARCH CENTERS.—

(1) IN GENERAL.—The Secretary shall establish, through competitive bids, not more than 4 energy storage research centers to translate basic research into applied technologies to advance the capability of the United States to maintain a globally competitive posture in energy storage systems for electric drive vehicles, stationary applications, and electricity transmission and distribution.

(2) PROGRAM MANAGEMENT.—The centers shall be managed by the Under Secretary for Science of the Department.

(3) PARTICIPATION AGREEMENTS.—As a condition of participating in a center, a participant shall enter into a participation agreement with the center that requires that activities conducted by the participant for the center promote the goal of enabling the United States to compete successfully in global energy storage markets.

(4) PLANS.—A center shall conduct activities that promote the achievement of the goals of the plans of the Council under subsection (e)(4).

(5) NATIONAL LABORATORIES.—A national laboratory (as defined in section 2 of the Energy Policy Act of 2005 (42 U.S.C. 15801)) may participate in a center established under this sub-

section, including a cooperative research and development agreement (as defined in section 12(d) of the Stevenson-Wydler Technology Innovation Act of 1980 (15 U.S.C. 3710a(d))).

(6) DISCLOSURE.—Section 623 of the Energy Policy Act of 1992 (42 U.S.C. 13293) may apply to any project carried out through a grant, contract, or cooperative agreement under this subsection.

(7) INTELLECTUAL PROPERTY.—In accordance with section 202(a)(ii) of title 35, United States Code, section 152 of the Atomic Energy Act of 1954 (42 U.S.C. 2182), and section 9 of the Federal Nonnuclear Energy Research and Development Act of 1974 (42 U.S.C. 5908), the Secretary may require, for any new invention developed under this subsection, that—

(A) if an industrial participant is active in a energy storage research center established under this subsection relating to the advancement of energy storage technologies carried out, in whole or in part, with Federal funding, the industrial participant be granted the first option to negotiate with the invention owner, at least in the field of energy storage technologies, nonexclusive licenses, and royalties on terms that are reasonable, as determined by the Secretary;

(B) if 1 or more industry participants are active in a center, during a 2-year period beginning on the date on which an invention is made—

(i) the patent holder shall not negotiate any license or royalty agreement with any entity that is not an industrial participant under this subsection; and

(ii) the patent holder shall negotiate nonexclusive licenses and royalties in good faith with any interested industrial participant under this subsection; and

(C) the new invention be developed under such other terms as the Secretary determines to be necessary to promote the accelerated commercialization of inventions made under this subsection to advance the capability of the United States to successfully compete in global energy storage markets.

(i) ENERGY STORAGE SYSTEMS DEMONSTRATIONS.—

(1) IN GENERAL.—The Secretary shall carry out a program of new demonstrations of advanced energy storage systems.

(2) SCOPE.—The demonstrations shall—

(A) be regionally diversified; and

(B) expand on the existing technology demonstration program of the Department.

(3) STAKEHOLDERS.—In carrying out the demonstrations, the Secretary shall, to the maximum extent practicable, include the participation of a range of stakeholders, including—

(A) rural electric cooperatives;

(B) investor owned utilities;

(C) municipally owned electric utilities;

(D) energy storage systems manufacturers;

(E) electric drive vehicle manufacturers;

(F) the renewable energy production industry;

(G) State or local energy offices;

(H) the fuel cell industry; and

(I) institutions of higher education.

(4) OBJECTIVES.—Each of the demonstrations shall include 1 or more of the following:

(A) Energy storage to improve the feasibility of microgrids or islanding, or transmission and distribution capability, to improve reliability in rural areas.

(B) Integration of an energy storage system with a self-healing grid.

(C) Use of energy storage to improve security to emergency response infrastructure and ensure availability of emergency backup power for consumers.

(D) Integration with a renewable energy production source, at the source or away from the source.

(E) Use of energy storage to provide ancillary services, such as spinning reserve services, for grid management.

(F) Advancement of power conversion systems to make the systems smarter, more efficient, able to communicate with other inverters, and able to control voltage.

(G) Use of energy storage to optimize transmission and distribution operation and power quality, which could address overloaded lines and maintenance of transformers and substations.

(H) Use of advanced energy storage for peak load management of homes, businesses, and the grid.

(I) Use of energy storage devices to store energy during nonpeak generation periods to make better use of existing grid assets.

(j) VEHICLE ENERGY STORAGE DEMONSTRATION.—

(1) IN GENERAL.—The Secretary shall carry out a program of electric drive vehicle energy storage technology demonstrations.

(2) CONSORTIA.—The technology demonstrations shall be conducted through consortia, which may include—

(A) energy storage systems manufacturers and suppliers of the manufacturers;

(B) electric drive vehicle manufacturers;

(C) rural electric cooperatives;

(D) investor owned utilities;

(E) municipal and rural electric utilities;

(F) State and local governments;

(G) metropolitan transportation authorities; and

(H) institutions of higher education.

(3) OBJECTIVES.—The program shall demonstrate 1 or more of the following:

(A) Novel, high capacity, high efficiency energy storage, charging, and control systems, along with the collection of data on performance characteristics, such as battery life, energy storage capacity, and power delivery capacity.

(B) Advanced onboard energy management systems and highly efficient battery cooling systems.

(C) Integration of those systems on a prototype vehicular platform, including with drivetrain systems for passenger, commercial, and nonroad electric drive vehicles.

(D) New technologies and processes that reduce manufacturing costs.

(E) Integration of advanced vehicle technologies with electricity distribution system and smart metering technology.

(F) Control systems that minimize emissions profiles in cases in which clean diesel engines are part of a plug-in hybrid drive system.

(k) **ELECTRIC DRIVE VEHICLE BATTERY SECOND-LIFE APPLICATIONS AND RECYCLING.**—

(1) **DEFINITIONS.**—In this subsection:

(A) **BATTERY RECYCLING AND SECOND-LIFE APPLICATIONS PROGRAM.**—The term “battery recycling and second-life applications program” means the electric drive vehicle battery recycling and second-life applications program established under paragraph (3).

(B) **CRITICAL MATERIAL.**—The term “critical material” has the meaning given the term in section 7002(a) of the Energy Act of 2020 (30 U.S.C. 1606(a)).

(C) **ECONOMICALLY DISTRESSED AREA.**—The term “economically distressed area” means an area described in section 301(a) of the Public Works and Economic Development Act of 1965 (42 U.S.C. 3161(a)).

(D) **ELECTRIC DRIVE VEHICLE BATTERY.**—The term “electric drive vehicle battery” means any battery that is a motive power source for an electric drive vehicle.

(E) **ELIGIBLE ENTITY.**—The term “eligible entity” means an entity described in any of paragraphs (1) through (5) of section 989(b) of the Energy Policy Act of 2005 (42 U.S.C. 16353(b)).

(2) **PROGRAM.**—The Secretary shall carry out a program of research, development, and demonstration of—

(A) second-life applications for electric drive vehicle batteries that have been used to power electric drive vehicles; and

(B) technologies and processes for final recycling and disposal of the devices described in subparagraph (A).

(3) **ELECTRIC DRIVE VEHICLE BATTERY RECYCLING AND SECOND-LIFE APPLICATIONS.**—

(A) **IN GENERAL.**—In carrying out the program under paragraph (2), the Secretary shall establish an electric drive vehicle battery recycling and second-life applications program under which the Secretary shall—

(i) award grants under subparagraph (D); and

(ii) carry out other activities in accordance with this paragraph.

(B) **PURPOSES.**—The purposes of the battery recycling and second-life applications program are the following:

(i) To improve the recycling rates and second-use adoption rates of electric drive vehicle batteries.

(ii) To optimize the design and adaptability of electric drive vehicle batteries to make electric drive vehicle batteries more easily recyclable.

(iii) To establish alternative supply chains for critical materials that are found in electric drive vehicle batteries.

(iv) To reduce the cost of manufacturing, installation, purchase, operation, and maintenance of electric drive vehicle batteries.

(v) To improve the environmental impact of electric drive vehicle battery recycling processes.

(C) TARGETS.—In carrying out the battery recycling and second-life applications program, the Secretary shall address near-term (up to 2 years), mid-term (up to 5 years), and long-term (up to 10 years) challenges to the recycling of electric drive vehicle batteries.

(D) GRANTS.—

(i) IN GENERAL.—In carrying out the battery recycling and second-life applications program, the Secretary shall award multiyear grants on a competitive, merit-reviewed basis to eligible entities—

(I) to conduct research, development, testing, and evaluation of solutions to increase the rate and productivity of electric drive vehicle battery recycling; and

(II) for research, development, and demonstration projects to create innovative and practical approaches to increase the recycling and second-use of electric drive vehicle batteries, including by addressing—

(aa) technology to increase the efficiency of electric drive vehicle battery recycling and maximize the recovery of critical materials for use in new products;

(bb) expanded uses for critical materials recovered from electric drive vehicle batteries;

(cc) product design and construction to facilitate the disassembly and recycling of electric drive vehicle batteries;

(dd) product design and construction and other tools and techniques to extend the lifecycle of electric drive vehicle batteries, including methods to promote the safe second-use of electric drive vehicle batteries;

(ee) strategies to increase consumer acceptance of, and participation in, the recycling of electric drive vehicle batteries;

(ff) improvements and changes to electric drive vehicle battery chemistries that include ways to decrease processing costs for battery recycling without sacrificing front-end performance;

(gg) second-use of electric drive vehicle batteries, including in applications outside of the automotive industry; and

(hh) the commercialization and scale-up of electric drive vehicle battery recycling technologies.

(ii) **PRIORITY.**—In awarding grants under clause (i), the Secretary shall give priority to projects that—

(I) are located in geographically diverse regions of the United States;

(II) include business commercialization plans that have the potential for the recycling of electric drive vehicle batteries at high volumes;

(III) support the development of advanced manufacturing technologies that have the potential to improve the competitiveness of the United States in the international electric drive vehicle battery manufacturing sector;

(IV) provide the greatest potential to reduce costs for consumers and promote accessibility and community implementation of demonstrated technologies;

(V) increase disclosure and transparency of information to consumers;

(VI) support the development or demonstration of projects in economically distressed areas; and

(VII) support other relevant priorities, as determined to be appropriate by the Secretary.

(iii) **SOLICITATION.**—Not later than 90 days after the date of enactment of the Infrastructure Investment and Jobs Act, and annually thereafter, the Secretary shall conduct a national solicitation for applications for grants described in clause (i).

(iv) **DISSEMINATION OF RESULTS.**—The Secretary shall publish the results of the projects carried out through grants awarded under clause (i) through—

(I) best practices relating to those grants, for use in the electric drive vehicle battery manufacturing, design, installation, refurbishing, or recycling industries;

(II) coordination with information dissemination programs relating to general recycling of electronic devices; and

(III) educational materials for the public, produced in conjunction with State and local governments or nonprofit organizations, on the problems and solutions relating to the recycling and second-life applications of electric drive vehicle batteries.

(E) **COORDINATION WITH OTHER PROGRAMS OF THE DEPARTMENT.**—In carrying out the battery recycling and second-life applications program, the Secretary shall coordinate and leverage the resources of complementary efforts of the Department.

(F) STUDY AND REPORT.—

(i) STUDY.—The Secretary shall conduct a study on the viable market opportunities available for the recycling, second-use, and manufacturing of electric drive vehicle batteries in the United States.

(ii) REPORT.—Not later than 1 year after the date of enactment of the Infrastructure Investment and Jobs Act, the Secretary shall submit to the Committee on Energy and Natural Resources of the Senate, the Committee on Science, Space, and Technology of the House of Representatives, and any other relevant committee of Congress a report containing the results of the study under clause (i), including a description of—

(I) the ability of relevant businesses or other entities to competitively manufacture electric drive vehicle batteries and recycle electric drive vehicle batteries in the United States;

(II) any existing electric drive vehicle battery recycling and second-use practices and plans of electric drive vehicle manufacturing companies in the United States;

(III) any barriers to electric drive vehicle battery recycling in the United States;

(IV) opportunities and barriers in electric drive vehicle battery supply chains in the United States and internationally, including with allies and trading partners;

(V) opportunities for job creation in the electric drive vehicle battery recycling and manufacturing fields and the necessary skills employees must acquire for growth of those fields in the United States;

(VI) policy recommendations for enhancing electric drive vehicle battery manufacturing and recycling in the United States;

(VII) any recommendations for lowering logistics costs and creating better coordination and efficiency with respect to the removal, collection, transportation, storage, and disassembly of electric drive vehicle batteries;

(VIII) any recommendations for areas of coordination with other Federal agencies to improve electric drive vehicle battery recycling rates in the United States;

(IX) an aggressive 2-year target and plan, the implementation of which shall begin during the 90-day period beginning on the date on which the report is submitted, to enhance the competitiveness of electric drive vehicle battery manufacturing and recycling in the United States; and

(X) needs for future research, development, and demonstration projects in electric drive vehicle battery manufacturing, recycling, and related areas, as determined by the Secretary.

(G) EVALUATION.—Not later than 3 years after the date on which the report under subparagraph (F)(ii) is submitted, and every 4 years thereafter, the Secretary shall conduct, and make available to the public and the relevant committees of Congress, an independent review of the progress of the grants awarded under subparagraph (D) in meeting the recommendations and targets included in the report.

(I) COST SHARING.—The Secretary shall carry out the programs established under this section in accordance with section 988 of the Energy Policy Act of 2005 (42 U.S.C. 16352).

(m) MERIT REVIEW OF PROPOSALS.—The Secretary shall carry out the programs established under subsections (i), (j), and (k) in accordance with section 989 of the Energy Policy Act of 2005 (42 U.S.C. 16353).

(n) COORDINATION AND NONDUPLICATION.—To the maximum extent practicable, the Secretary shall coordinate activities under this section with other programs and laboratories of the Department and other Federal research programs.

(o) REVIEW BY NATIONAL ACADEMY OF SCIENCES.—On the business day that is 5 years after the date of enactment of this Act, the Secretary shall offer to enter into an arrangement with the National Academy of Sciences to assess the performance of the Department in carrying out this section.

(p) AUTHORIZATION OF APPROPRIATIONS.—There are authorized to be appropriated to carry out—

(1) the basic research program under subsection (f) \$50,000,000 for each of fiscal years 2009 through 2018;

(2) the applied research program under subsection (g) \$80,000,000 for each of fiscal years 2009 through 2018; and

(3) the energy storage research center program under subsection (h) \$100,000,000 for each of fiscal years 2009 through 2018;

(4) the energy storage systems demonstration program under subsection (i) \$30,000,000 for each of fiscal years 2009 through 2018;

(5) the vehicle energy storage demonstration program under subsection (j) \$30,000,000 for each of fiscal years 2009 through 2018; and

(6) the electric drive vehicle battery recycling and second-life applications program under subsection (k) \$200,000,000 for the period of fiscal years 2022 through 2026.

(q) CRITICAL MATERIAL RECYCLING AND REUSE RESEARCH, DEVELOPMENT, AND DEMONSTRATION PROGRAM.—

(1) DEFINITIONS.—In this subsection:

(A) CRITICAL MATERIAL.—The term “critical material” has the meaning given the term in 7002 of the Energy Act of 2020.

(B) CRITICAL MATERIAL RECYCLING.—The term “critical material recycling” means the separation and recovery of critical materials embedded within an energy storage system through physical or chemical means for the purpose of reuse of those critical materials in other technologies.

(2) ESTABLISHMENT.—Not later than 180 days after the date of enactment of this subsection, the Secretary shall establish a research, development, and demonstration program for critical material recycling and reuse of energy storage systems containing critical materials.

(3) RESEARCH, DEVELOPMENT, AND DEMONSTRATION.—In carrying out the program established under paragraph (1), the Secretary shall conduct—

(A) research, development, and demonstration activities for—

(i) technologies, process improvements, and design optimizations that facilitate and promote critical material recycling of energy storage systems, including separation and sorting of component materials of such systems, and extraction, recovery, and reuse of critical materials from such systems;

(ii) technologies and methods that mitigate emissions and environmental impacts that arise from critical material recycling, including disposal of toxic reagents and byproducts related to critical material recycling processes;

(iii) technologies to enable extraction, recovery, and reuse of energy storage systems from electric vehicles and critical material recycling from such vehicles; and

(iv) technologies and methods to enable the safe transport, storage, and disposal of energy storage systems containing critical materials, including waste materials and components recovered during the critical material recycling process; and

(B) research on nontechnical barriers to improve the collection and critical material recycling of energy storage systems, including strategies to improve consumer education of, acceptance of, and participation in, the critical material recycling of energy storage systems.

(4) REPORT TO CONGRESS.—Not later than 2 years after the date of enactment of this subsection, and every 3 years thereafter, the Secretary shall submit to the Committee on Science, Space, and Technology and the Committee on Energy and Commerce of the House of Representatives and the Committee on Energy and Natural Resources of the Senate a report summarizing the activities, findings, and progress of the program.

TITLE IX—INTERNATIONAL ENERGY PROGRAMS

SEC. 901. [42 U.S.C. 17321] DEFINITIONS.

In this title:

(1) APPROPRIATE CONGRESSIONAL COMMITTEES.—The term “appropriate congressional committees” means—

(A) the Committee on Foreign Affairs and the Committee on Energy and Commerce of the House of Representatives; and

- (B) the Committee on Foreign Relations, the Committee on Energy and Natural Resources, the Committee on Environment and Public Works, and the Committee on Commerce, Science, and Transportation of the Senate.
- (2) CLEAN AND EFFICIENT ENERGY TECHNOLOGY.—The term “clean and efficient energy technology” means an energy supply or end-use technology that, compared to a similar technology already in widespread commercial use in a recipient country, will—
- (A) reduce emissions of greenhouse gases; or
 - (B)(i) increase efficiency of energy production; or
 - (ii) decrease intensity of energy usage.
- (3) GREENHOUSE GAS.—The term “greenhouse gas” means—
- (A) carbon dioxide;
 - (B) methane;
 - (C) nitrous oxide;
 - (D) hydrofluorocarbons;
 - (E) perfluorocarbons; or
 - (F) sulfur hexafluoride.

Subtitle A—Assistance to Promote Clean and Efficient Energy Technologies in Foreign Countries

SEC. 911. [42 U.S.C. 17331] UNITED STATES ASSISTANCE FOR DEVELOPING COUNTRIES.

(a) ASSISTANCE AUTHORIZED.—The Administrator of the United States Agency for International Development shall support policies and programs in developing countries that promote clean and efficient energy technologies—

- (1) to produce the necessary market conditions for the private sector delivery of energy and environmental management services;
- (2) to create an environment that is conducive to accepting clean and efficient energy technologies that support the overall purpose of reducing greenhouse gas emissions, including—
 - (A) improving policy, legal, and regulatory frameworks;
 - (B) increasing institutional abilities to provide energy and environmental management services; and
 - (C) increasing public awareness and participation in the decision-making of delivering energy and environmental management services; and
- (3) to promote the use of American-made clean and efficient energy technologies, products, and energy and environmental management services.

(b) REPORT.—The Administrator of the United States Agency for International Development shall submit to the appropriate congressional committees an annual report on the implementation of this section for each of the fiscal years 2008 through 2012.

(c) AUTHORIZATION OF APPROPRIATIONS.—To carry out this section, there are authorized to be appropriated to the Administrator

of the United States Agency for International Development \$200,000,000 for each of the fiscal years 2008 through 2012.

SEC. 912. [42 U.S.C. 17332] UNITED STATES EXPORTS AND OUTREACH PROGRAMS FOR INDIA, CHINA, AND OTHER COUNTRIES.

(a) ASSISTANCE AUTHORIZED.—The Secretary of Commerce shall direct the United States and Foreign Commercial Service to expand or create a corps of the Foreign Commercial Service officers to promote United States exports in clean and efficient energy technologies and build the capacity of government officials in India, China, and any other country the Secretary of Commerce determines appropriate, to become more familiar with the available technologies—

(1) by assigning or training Foreign Commercial Service attachés, who have expertise in clean and efficient energy technologies from the United States, to embark on business development and outreach efforts to such countries; and

(2) by deploying the attachés described in paragraph (1) to educate provincial, state, and local government officials in such countries on the variety of United States-based technologies in clean and efficient energy technologies for the purposes of promoting United States exports and reducing global greenhouse gas emissions.

(b) REPORT.—The Secretary of Commerce shall submit to the appropriate congressional committees an annual report on the implementation of this section for each of the fiscal years 2008 through 2012.

(c) AUTHORIZATION OF APPROPRIATIONS.—To carry out this section, there are authorized to be appropriated to the Secretary of Commerce such sums as may be necessary for each of the fiscal years 2008 through 2012.

SEC. 913. [42 U.S.C. 17333] UNITED STATES TRADE MISSIONS TO ENCOURAGE PRIVATE SECTOR TRADE AND INVESTMENT.

(a) ASSISTANCE AUTHORIZED.—The Secretary of Commerce shall direct the International Trade Administration to expand or create trade missions to and from the United States to encourage private sector trade and investment in clean and efficient energy technologies—

(1) by organizing and facilitating trade missions to foreign countries and by matching United States private sector companies with opportunities in foreign markets so that clean and efficient energy technologies can help to combat increases in global greenhouse gas emissions; and

(2) by creating reverse trade missions in which the Department of Commerce facilitates the meeting of foreign private and public sector organizations with private sector companies in the United States for the purpose of showcasing clean and efficient energy technologies in use or in development that could be exported to other countries.

(b) REPORT.—The Secretary of Commerce shall submit to the appropriate congressional committees an annual report on the implementation of this section for each of the fiscal years 2008 through 2012.

(c) **AUTHORIZATION OF APPROPRIATIONS.**—To carry out this section, there are authorized to be appropriated to the Secretary of Commerce such sums as may be necessary for each of the fiscal years 2008 through 2012.

SEC. 914. ⁶ [42 U.S.C. 17334] ACTIONS BY OVERSEAS PRIVATE INVESTMENT CORPORATION.

(a) **SENSE OF CONGRESS.**—It is the sense of Congress that the Overseas Private Investment Corporation should promote greater investment in clean and efficient energy technologies by—

(1) proactively reaching out to United States companies that are interested in investing in clean and efficient energy technologies in countries that are significant contributors to global greenhouse gas emissions;

(2) giving preferential treatment to the evaluation and awarding of projects that involve the investment or utilization of clean and efficient energy technologies; and

(3) providing greater flexibility in supporting projects that involve the investment or utilization of clean and efficient energy technologies, including financing, insurance, and other assistance.

(b) **REPORT.**—The Overseas Private Investment Corporation shall include in its annual report required under section 240A of the Foreign Assistance Act of 1961 (22 U.S.C. 2200a)—

(1) a description of the activities carried out to implement this section; or

(2) if the Corporation did not carry out any activities to implement this section, an explanation of the reasons therefor.

[Note: Section 1470(v)(1) of the BUILD Act of 2018 (division F of Public Law 115-254) provides for an amendments to section 914. Section 1470(w) of such Act states “The amendments made by this section shall take effect at the end of the transition period.”. Section 1461(2) of such Act defines the term “transition period” as follows: “The term ‘transition period’ means the period—(A) beginning on the date of the enactment of this Act; and (B) ending on the effective date of the reorganization plan required by section 1462(e).”. For details relating to the reorganization plan, see section 1462(e) of such Act. Upon such date, section 914 reads as follows:]

SEC. 914. [42 U.S.C. 17334] ACTIONS BY UNITED STATES INTERNATIONAL DEVELOPMENT FINANCE CORPORATION.

(a) **SENSE OF CONGRESS.**—*It is the sense of Congress that the United States International Development Finance Corporation should promote greater investment in clean and efficient energy technologies by—*

(1) proactively reaching out to United States companies that are interested in investing in clean and efficient energy technologies in countries that are significant contributors to global greenhouse gas emissions;

⁶For version of law for section 914, as amended by section 1470(v)(1) of division F of Public Law 115-254, see note below.

(2) giving preferential treatment to the evaluation and awarding of projects that involve the investment or utilization of clean and efficient energy technologies; and

(3) providing greater flexibility in supporting projects that involve the investment or utilization of clean and efficient energy technologies, including financing, insurance, and other assistance.

(b) *REPORT.*—The United States International Development Finance Corporation shall include in its annual report required under section 1443 of the Better Utilization of Investments Leading to Development Act of 2018—

(1) a description of the activities carried out to implement this section; or

(2) if the Corporation did not carry out any activities to implement this section, an explanation of the reasons therefor.

SEC. 915. [42 U.S.C. 17335] ACTIONS BY UNITED STATES TRADE AND DEVELOPMENT AGENCY.

(a) *ASSISTANCE AUTHORIZED.*—The Director of the Trade and Development Agency shall establish or support policies that—

(1) proactively seek opportunities to fund projects that involve the utilization of clean and efficient energy technologies, including in trade capacity building and capital investment projects;

(2) where appropriate, advance the utilization of clean and efficient energy technologies, particularly to countries that have the potential for significant reduction in greenhouse gas emissions; and

(3) recruit and retain individuals with appropriate expertise or experience in clean, renewable, and efficient energy technologies to identify and evaluate opportunities for projects that involve clean and efficient energy technologies and services.

(b) *REPORT.*—The President shall include in the annual report on the activities of the Trade and Development Agency required under section 661(d) of the Foreign Assistance Act of 1961 (22 U.S.C. 2421(d)) a description of the activities carried out to implement this section.

SEC. 916. [42 U.S.C. 17336] DEPLOYMENT OF INTERNATIONAL CLEAN AND EFFICIENT ENERGY TECHNOLOGIES AND INVESTMENT IN GLOBAL ENERGY MARKETS

(a) *TASK FORCE.*—

(1) *ESTABLISHMENT.*—Not later than 90 days after the date of the enactment of this Act, the President shall establish a Task Force on International Cooperation for Clean and Efficient Energy Technologies (in this section referred to as the “Task Force”).

(2) *COMPOSITION.*—The Task Force shall be composed of representatives, appointed by the head of the respective Federal department or agency, of—

- (A) the Council on Environmental Quality;
- (B) the Department of Energy;
- (C) the Department of Commerce;
- (D) the Department of the Treasury;

- (E) the Department of State;
 - (F) the Environmental Protection Agency;
 - (G) the United States Agency for International Development;
 - (H) the Export-Import Bank of the United States;
 - (I) the Overseas Private Investment Corporation;⁷
 - (J) the Trade and Development Agency;
 - (K) the Small Business Administration;
 - (L) the Office of the United States Trade Representative; and
 - (M) other Federal departments and agencies, as determined by the President.
- (3) CHAIRPERSON.—The President shall designate a Chairperson or Co-Chairpersons of the Task Force.
- (4) DUTIES.—The Task Force—
- (A) shall develop and assist in the implementation of the strategy required under subsection (c); and
 - (B)(i) shall analyze technology, policy, and market opportunities for the development, demonstration, and deployment of clean and efficient energy technologies on an international basis; and
 - (ii) shall examine relevant trade, tax, finance, international, and other policy issues to assess which policies, in the United States and in developing countries, would help open markets and improve the export of clean and efficient energy technologies from the United States.
- (5) TERMINATION.—The Task Force, including any working group established by the Task Force pursuant to subsection (b), shall terminate 12 years after the date of the enactment of this Act.
- (b) WORKING GROUPS.—
- (1) ESTABLISHMENT.—The Task Force—
- (A) shall establish an Interagency Working Group on the Export of Clean and Efficient Energy Technologies (in this section referred to as the “Interagency Working Group”); and
 - (B) may establish other working groups as may be necessary to carry out this section.
- (2) COMPOSITION.—The Interagency Working Group shall be composed of—
- (A) the Secretary of Energy, the Secretary of Commerce, and the Secretary of State, who shall serve as Co-Chairpersons of the Interagency Working Group; and
 - (B) other members, as determined by the Chairperson or Co-Chairpersons of the Task Force.

⁷The colon in subparagraph (I) is so in law. Probably should be a semicolon (note that this technical grammatical error is addressed by the pending amendment stated in the next sentence). Section 1470(v)(2) of the BUILD Act of 2018 (division F of Public Law 115-254) provides for an amendment to strike “Overseas Private Investment Corporation.” and insert “United States International Development Finance Corporation.”. Section 1470(w) of such Act states “The amendments made by this section shall take effect at the end of the transition period.”. Section 1461(2) of such Act defines the term “transition period” as follows: “The term ‘transition period’ means the period—(A) beginning on the date of the enactment of this Act; and (B) ending on the effective date of the reorganization plan required by section 1462(e).”. For details relating to the reorganization plan, see section 1462(e) of such Act.

(3) DUTIES.—The Interagency Working Group shall coordinate the resources and relevant programs of the Department of Energy, the Department of Commerce, the Department of State, and other relevant Federal departments and agencies to support the export of clean and efficient energy technologies developed or demonstrated in the United States to other countries and the deployment of such clean and efficient energy technologies in such other countries.

(4) INTERAGENCY CENTER.—The Interagency Working Group—

(A) shall establish an Interagency Center on the Export of Clean and Efficient Energy Technologies (in this section referred to as the “Interagency Center”) to assist the Interagency Working Group in carrying out its duties required under paragraph (3); and

(B) shall locate the Interagency Center at a site agreed upon by the Co-Chairpersons of the Interagency Working Group, with the approval of the Chairperson or Co-Chairpersons of the Task Force.

(c) STRATEGY.—

(1) IN GENERAL.—Not later than 1 year after the date of the enactment of this Act, the Task Force shall develop and submit to the President and the appropriate congressional committees a strategy to—

(A) support the development and implementation of programs, policies, and initiatives in developing countries to promote the adoption and deployment of clean and efficient energy technologies, with an emphasis on those developing countries that are expected to experience the most significant growth in energy production and use over the next 20 years;

(B) open and expand clean and efficient energy technology markets and facilitate the export of clean and efficient energy technologies to developing countries, in a manner consistent with United States obligations as a member of the World Trade Organization;

(C) integrate into the foreign policy objectives of the United States the promotion of—

(i) the deployment of clean and efficient energy technologies and the reduction of greenhouse gas emissions in developing countries; and

(ii) the export of clean and efficient energy technologies; and

(D) develop financial mechanisms and instruments, including securities that mitigate the political and foreign exchange risks of uses that are consistent with the foreign policy objectives of the United States by combining the private sector market and government enhancements, that—

(i) are cost-effective; and

(ii) facilitate private capital investment in clean and efficient energy technology projects in developing countries.

(2) UPDATES.—Not later than 3 years after the date of submission of the strategy under paragraph (1), and every 3 years

thereafter, the Task Force shall update the strategy in accordance with the requirements of paragraph (1).

(d) REPORT.—

(1) IN GENERAL.—Not later than 3 years after the date of submission of the strategy under subsection (c)(1), and every 3 years thereafter, the President shall transmit to the appropriate congressional committees a report on the implementation of this section for the prior 3-year period.

(2) MATTERS TO BE INCLUDED.—The report required under paragraph (1) shall include the following:

(A) The update of the strategy required under subsection (c)(2) and a description of the actions taken by the Task Force to assist in the implementation of the strategy.

(B) A description of actions taken by the Task Force to carry out the duties required under subsection (a)(4)(B).

(C) A description of assistance provided under this section.

(D) The results of programs, projects, and activities carried out under this section.

(E) A description of priorities for promoting the diffusion and adoption of clean and efficient energy technologies and strategies in developing countries, taking into account economic and security interests of the United States and opportunities for the export of technology of the United States.

(F) Recommendations to the heads of appropriate Federal departments and agencies on methods to streamline Federal programs and policies to improve the role of such Federal departments and agencies in the development, demonstration, and deployment of clean and efficient energy technologies on an international basis.

(G) Strategies to integrate representatives of the private sector and other interested groups on the export and deployment of clean and efficient energy technologies.

(H) A description of programs to disseminate information to the private sector and the public on clean and efficient energy technologies and opportunities to transfer such clean and efficient energy technologies.

(e) AUTHORIZATION OF APPROPRIATIONS.—There are authorized to be appropriated to carry out this section \$5,000,000 for each of fiscal years 2008 through 2020.

SEC. 917. [42 U.S.C. 17337] UNITED STATES-ISRAEL ENERGY COOPERATION.

(a) FINDINGS.—Congress finds that—

(1) it is in the highest national security interests of the United States to develop covered energy sources;

(2) the State of Israel is a steadfast ally of the United States;

(3) the special relationship between the United States and Israel is manifested in a variety of cooperative scientific research and development programs, such as—

(A) the United States-Israel Binational Science Foundation; and

- (B) the United States-Israel Binational Industrial Research and Development Foundation;
- (4) those programs have made possible—
- (A) many scientific, technological, and commercial breakthroughs in the fields of life sciences, medicine, bio-engineering, agriculture, biotechnology, communications, and others; and
- (B) significant contributions to the development of renewable energy and energy efficiency through the established programs of the United States-Israel Binational Industrial Research and Development Foundation and the United States-Israel Binational Science Foundation;
- (5) on February 1, 1996, the Secretary of Energy (referred to in this section as the “Secretary”) and the Israeli Minister of Energy and Infrastructure signed an agreement to establish a framework for collaboration between the United States and Israel in energy research and development activities;
- (6) Israeli scientists and engineers are at the forefront of research and development in the field of covered energy sources;
- (7) enhanced cooperation between the United States and Israel for the purpose of research and development of covered energy sources would be in the national interests of both countries;
- (8) United States-Israel energy cooperation and the development of natural resources by Israel are in the strategic interest of the United States;
- (9) Israel is a strategic partner of the United States in water technology;
- (10) the United States can play a role in assisting Israel with regional safety and security issues;
- (11) the National Science Foundation of the United States, to the extent consistent with the National Science Foundation’s mission, should collaborate with the Israel Science Foundation and the United States-Israel Binational Science Foundation;
- (12) the United States and Israel should strive to develop more robust academic cooperation in—
- (A) energy innovation technology and engineering;
- (B) water science;
- (C) technology transfer; and
- (D) analysis of emerging geopolitical implications, crises and threats from foreign natural resource and energy acquisitions, and the development of domestic resources as a response;
- (13) the United States supports the goals of the Alternative Fuels Administration of Israel with respect to expanding the use of alternative fuels;
- (14) the United States strongly urges open dialogue and continued mechanisms for regular engagement and encourages further cooperation between applicable departments, agencies, ministries, institutions of higher education, and the private sector of the United States and Israel on energy security issues, including—

(A) identifying policy priorities associated with the development of natural resources of Israel;

(B) discussing and sharing best practices to secure cyber energy infrastructure and other energy security matters;

(C) leveraging natural gas to positively impact regional stability;

(D) issues relating to the energy-water nexus, including improving energy efficiency and the overall performance of water technologies through research and development in water desalination, wastewater treatment and reclamation, water treatment in gas and oil production processes, and other water treatment refiners;

(E) technical and environmental management of deep-water exploration and production;

(F) emergency response and coastal protection and restoration;

(G) academic outreach and engagement;

(H) private sector and business development engagement;

(I) regulatory consultations;

(J) leveraging alternative transportation fuels and technologies; and

(K) any other areas determined appropriate by the United States and Israel;

(15) the United States—

(A) acknowledges the achievements and importance of the Binational Industrial Research and Development Foundation and the United States-Israel Binational Science Foundation; and

(B) supports continued multiyear funding to ensure the continuity of the programs of the foundations specified in subparagraph (A); and

(16) the United States and Israel have a shared interest in addressing immediate, near-term, and long-term energy, energy poverty, energy independence, and environmental challenges facing the United States and Israel, respectively.

(b) GRANT PROGRAM.—

(1) ESTABLISHMENT.—In implementing the agreement entitled the “Agreement between the Department of Energy of the United States of America and the Ministry of Energy and Infrastructure of Israel Concerning Energy Cooperation”, dated February 1, 1996, the Secretary shall establish a grant program in accordance with the requirements of sections 988 and 989 of the Energy Policy Act of 2005 (42 U.S.C. 16352, 16353) to support research, development, and commercialization of covered energy.

(2) TYPES OF ENERGY.—In carrying out paragraph (1), the Secretary may make grants to promote—

(A) solar energy;

(B) biomass energy;

(C) energy efficiency;

(D) wind energy;

(E) geothermal energy;

(F) wave and tidal energy;

(G) advanced battery technology;

(H) natural gas energy, including conventional and unconventional natural gas technologies and other associated technologies, and natural gas projects conducted by or in conjunction with the United States-Israel Binational Science Foundation and the United States-Israel Binational Industrial Research and Development Foundation; and

(I) improvement of energy efficiency and the overall performance of water technologies through research and development in water desalination, wastewater treatment and reclamation, and other water treatment refiners.

(3) ELIGIBLE APPLICANTS.—An applicant shall be eligible to receive a grant under this subsection if the project of the applicant—

(A) addresses a requirement in the area of improved covered energy sources, as determined by the Secretary; and

(B) is a joint venture between—

(i)(I) a for-profit business entity, academic institution, National Laboratory (as defined in section 2 of the Energy Policy Act of 2005 (42 U.S.C. 15801)), or nonprofit entity in the United States; and

(II) a for-profit business entity, academic institution, or nonprofit entity in Israel; or

(ii)(I) the Federal Government; and

(II) the Government of Israel.

(4) APPLICATIONS.—To be eligible to receive a grant under this subsection, an applicant shall submit to the Secretary an application for the grant in accordance with procedures established by the Secretary, in consultation with the advisory board established under paragraph (5).

(5) ADVISORY BOARD.—

(A) ESTABLISHMENT.—The Secretary shall establish an advisory board—

(i) to monitor the method by which grants are awarded under this subsection; and

(ii) to provide to the Secretary periodic performance reviews of actions taken to carry out this subsection.

(B) COMPOSITION.—The advisory board established under subparagraph (A) shall be composed of 3 members, to be appointed by the Secretary, of whom—

(i) 1 shall be a representative of the Federal Government;

(ii) 1 shall be selected from a list of nominees provided by the United States-Israel Binational Science Foundation; and

(iii) 1 shall be selected from a list of nominees provided by the United States-Israel Binational Industrial Research and Development Foundation.

(6) CONTRIBUTED FUNDS.—Notwithstanding section 3302 of title 31, United States Code, the Secretary may accept, retain,

and use funds contributed by any person, government entity, or organization for purposes of carrying out this subsection—

(A) without further appropriation; and

(B) without fiscal year limitation.

(7) REPORT.—Not later than 180 days after the date of completion of a project for which a grant is provided under this subsection, the grant recipient shall submit to the Secretary a report that contains—

(A) a description of the method by which the recipient used the grant funds; and

(B) an evaluation of the level of success of each project funded by the grant.

(8) CLASSIFICATION.—Grants shall be awarded under this subsection only for projects that are considered to be unclassified by both the United States and Israel.

(c) INTERNATIONAL PARTNERSHIPS.—

(1) IN GENERAL.—The Secretary, subject to the availability of appropriations, may enter into cooperative agreements supporting and enhancing dialogue and planning involving international partnerships between the Department, including National Laboratories of the Department, and the Government of Israel and its ministries, offices, and institutions.

(2) FEDERAL SHARE.—The Secretary may not pay more than 50 percent of Federal share of the costs of implementing cooperative agreements entered into pursuant to paragraph (1).

(3) ANNUAL REPORTS.—If the Secretary enters into agreements authorized by paragraph (1), the Secretary shall submit an annual report to the Committee on Energy and Natural Resources of the Senate, the Committee on Foreign Relations of the Senate, the Committee on Appropriations of the Senate, the Committee on Energy and Commerce of the House of Representatives, the Committee on Science, Space, and Technology of the House of Representatives, the Committee on Foreign Affairs of the House of Representatives, and the Committee on Appropriations of the House of Representatives that describes—

(A) actions taken to implement such agreements; and

(B) any projects undertaken pursuant to such agreements.

(d) UNITED STATES-ISRAEL ENERGY CENTER.—The Secretary may establish a joint United States-Israel Energy Center in the United States leveraging the experience, knowledge, and expertise of institutions of higher education and entities in the private sector, among others, in offshore energy development to further dialogue and collaboration to develop more robust academic cooperation in energy innovation technology and engineering, water science, technology transfer, and analysis of emerging geopolitical implications, crises and threats from foreign natural resource and energy acquisitions, and the development of domestic resources as a response.

(e) TERMINATION.—The grant program and the advisory committee established under this section terminate on September 30, 2024.

Subtitle B—International Clean Energy Foundation

SEC. 921. [42 U.S.C. 17351] DEFINITIONS.

In this subtitle:

(1) **BOARD.**—The term “Board” means the Board of Directors of the Foundation established pursuant to section 922(c).

(2) **CHIEF EXECUTIVE OFFICER.**—The term “Chief Executive Officer” means the chief executive officer of the Foundation appointed pursuant to section 922(b).

(3) **FOUNDATION.**—The term “Foundation” means the International Clean Energy Foundation established by section 922(a).

SEC. 922. [42 U.S.C. 17352] ESTABLISHMENT AND MANAGEMENT OF FOUNDATION.

(a) **ESTABLISHMENT.**—

(1) **IN GENERAL.**—There is established in the executive branch a foundation to be known as the “International Clean Energy Foundation” that shall be responsible for carrying out the provisions of this subtitle. The Foundation shall be a government corporation, as defined in section 103 of title 5, United States Code.

(2) **BOARD OF DIRECTORS.**—The Foundation shall be governed by a Board of Directors in accordance with subsection (c).

(3) **INTENT OF CONGRESS.**—It is the intent of Congress, in establishing the structure of the Foundation set forth in this subsection, to create an entity that serves the long-term foreign policy and energy security goals of reducing global greenhouse gas emissions.

(b) **CHIEF EXECUTIVE OFFICER.**—

(1) **IN GENERAL.**—There shall be in the Foundation a Chief Executive Officer who shall be responsible for the management of the Foundation.

(2) **APPOINTMENT.**—The Chief Executive Officer shall be appointed by the Board, with the advice and consent of the Senate, and shall be a recognized leader in clean and efficient energy technologies and climate change and shall have experience in energy security, business, or foreign policy, chosen on the basis of a rigorous search.

(3) **RELATIONSHIP TO BOARD.**—The Chief Executive Officer shall report to, and be under the direct authority of, the Board.

(4) **COMPENSATION AND RANK.**—

(A) **IN GENERAL.**—The Chief Executive Officer shall be compensated at the rate provided for level III of the Executive Schedule under section 5314 of title 5, United States Code.

(B) **AMENDMENT.**—Section 5314 of title 5, United States Code, is amended by adding at the end the following: “Chief Executive Officer, International Clean Energy Foundation.”.

(C) **AUTHORITIES AND DUTIES.**—The Chief Executive Officer shall be responsible for the management of the

Foundation and shall exercise the powers and discharge the duties of the Foundation.

(D) **AUTHORITY TO APPOINT OFFICERS.**—In consultation and with approval of the Board, the Chief Executive Officer shall appoint all officers of the Foundation.

(c) **BOARD OF DIRECTORS.**—

(1) **ESTABLISHMENT.**—There shall be in the Foundation a Board of Directors.

(2) **DUTIES.**—The Board shall perform the functions specified to be carried out by the Board in this subtitle and may prescribe, amend, and repeal bylaws, rules, regulations, and procedures governing the manner in which the business of the Foundation may be conducted and in which the powers granted to it by law may be exercised.

(3) **MEMBERSHIP.**—The Board shall consist of—

(A) the Secretary of State (or the Secretary's designee), the Secretary of Energy (or the Secretary's designee), and the Administrator of the United States Agency for International Development (or the Administrator's designee); and

(B) four other individuals with relevant experience in matters relating to energy security (such as individuals who represent institutions of energy policy, business organizations, foreign policy organizations, or other relevant organizations) who shall be appointed by the President, by and with the advice and consent of the Senate, of whom—

(i) one individual shall be appointed from among a list of individuals submitted by the Majority Leader of the House of Representatives;

(ii) one individual shall be appointed from among a list of individuals submitted by the Minority Leader of the House of Representatives;

(iii) one individual shall be appointed from among a list of individuals submitted by the Majority Leader of the Senate; and

(iv) one individual shall be appointed from among a list of individuals submitted by the Minority Leader of the Senate.

(4) **CHIEF EXECUTIVE OFFICER.**—The Chief Executive Officer of the Foundation shall serve as a nonvoting, ex officio member of the Board.

(5) **TERMS.**—

(A) **OFFICERS OF THE FEDERAL GOVERNMENT.**—Each member of the Board described in paragraph (3)(A) shall serve for a term that is concurrent with the term of service of the individual's position as an officer within the other Federal department or agency.

(B) **OTHER MEMBERS.**—Each member of the Board described in paragraph (3)(B) shall be appointed for a term of 3 years and may be reappointed for a term of an additional 3 years.

(C) **VACANCIES.**—A vacancy in the Board shall be filled in the manner in which the original appointment was made.

(D) ACTING MEMBERS.—A vacancy in the Board may be filled with an appointment of an acting member by the Chairperson of the Board for up to 1 year while a nominee is named and awaits confirmation in accordance with paragraph (3)(B).

(6) CHAIRPERSON.—There shall be a Chairperson of the Board. The Secretary of State (or the Secretary's designee) shall serve as the Chairperson.

(7) QUORUM.—A majority of the members of the Board described in paragraph (3) shall constitute a quorum, which, except with respect to a meeting of the Board during the 135-day period beginning on the date of the enactment of this Act, shall include at least 1 member of the Board described in paragraph (3)(B).

(8) MEETINGS.—The Board shall meet at the call of the Chairperson, who shall call a meeting no less than once a year.

(9) COMPENSATION.—

(A) OFFICERS OF THE FEDERAL GOVERNMENT.—

(i) IN GENERAL.—A member of the Board described in paragraph (3)(A) may not receive additional pay, allowances, or benefits by reason of the member's service on the Board.

(ii) TRAVEL EXPENSES.—Each such member of the Board shall receive travel expenses, including per diem in lieu of subsistence, in accordance with applicable provisions under subchapter I of chapter 57 of title 5, United States Code.

(B) OTHER MEMBERS.—

(i) IN GENERAL.—Except as provided in clause (ii), a member of the Board described in paragraph (3)(B)—

(I) shall be paid compensation out of funds made available for the purposes of this subtitle at the daily equivalent of the highest rate payable under section 5332 of title 5, United States Code, for each day (including travel time) during which the member is engaged in the actual performance of duties as a member of the Board; and

(II) while away from the member's home or regular place of business on necessary travel in the actual performance of duties as a member of the Board, shall be paid per diem, travel, and transportation expenses in the same manner as is provided under subchapter I of chapter 57 of title 5, United States Code.

(ii) LIMITATION.—A member of the Board may not be paid compensation under clause (i)(II) for more than 90 days in any calendar year.

SEC. 923. [42 U.S.C. 17353] DUTIES OF FOUNDATION.

The Foundation shall—

(1) use the funds authorized by this subtitle to make grants to promote projects outside of the United States that serve as models of how to significantly reduce the emissions of

global greenhouse gases through clean and efficient energy technologies, processes, and services;

(2) seek contributions from foreign governments, especially those rich in energy resources such as member countries of the Organization of the Petroleum Exporting Countries, and private organizations to supplement funds made available under this subtitle;

(3) harness global expertise through collaborative partnerships with foreign governments and domestic and foreign private actors, including nongovernmental organizations and private sector companies, by leveraging public and private capital, technology, expertise, and services towards innovative models that can be instituted to reduce global greenhouse gas emissions;

(4) create a repository of information on best practices and lessons learned on the utilization and implementation of clean and efficient energy technologies and processes to be used for future initiatives to tackle the climate change crisis;

(5) be committed to minimizing administrative costs and to maximizing the availability of funds for grants under this subtitle; and

(6) promote the use of American-made clean and efficient energy technologies, processes, and services by giving preference to entities incorporated in the United States and whose technology will be substantially manufactured in the United States.

SEC. 924. [42 U.S.C. 17354] ANNUAL REPORT.

(a) **REPORT REQUIRED.**—Not later than March 31, 2008, and each March 31 thereafter, the Foundation shall submit to the appropriate congressional committees a report on the implementation of this subtitle during the prior fiscal year.

(b) **CONTENTS.**—The report required by subsection (a) shall include—

(1) the total financial resources available to the Foundation during the year, including appropriated funds, the value and source of any gifts or donations accepted pursuant to section 925(a)(6), and any other resources;

(2) a description of the Board's policy priorities for the year and the basis upon which competitive grant proposals were solicited and awarded to nongovernmental institutions and other organizations;

(3) a list of grants made to nongovernmental institutions and other organizations that includes the identity of the institutional recipient, the dollar amount, and the results of the program; and

(4) the total administrative and operating expenses of the Foundation for the year, as well as specific information on—

(A) the number of Foundation employees and the cost of compensation for Board members, Foundation employees, and personal service contractors;

(B) costs associated with securing the use of real property for carrying out the functions of the Foundation;

(C) total travel expenses incurred by Board members and Foundation employees in connection with Foundation activities; and

(D) total representational expenses.

SEC. 925. [42 U.S.C. 17355] POWERS OF THE FOUNDATION; RELATED PROVISIONS.

(a) **POWERS.**—The Foundation—

(1) shall have perpetual succession unless dissolved by a law enacted after the date of the enactment of this Act;

(2) may adopt, alter, and use a seal, which shall be judicially noticed;

(3) may make and perform such contracts, grants, and other agreements with any person or government however designated and wherever situated, as may be necessary for carrying out the functions of the Foundation;

(4) may determine and prescribe the manner in which its obligations shall be incurred and its expenses allowed and paid, including expenses for representation;

(5) may lease, purchase, or otherwise acquire, improve, and use such real property wherever situated, as may be necessary for carrying out the functions of the Foundation;

(6) may accept money, funds, services, or property (real, personal, or mixed), tangible or intangible, made available by gift, bequest grant, or otherwise for the purpose of carrying out the provisions of this title from domestic or foreign private individuals, charities, nongovernmental organizations, corporations, or governments;

(7) may use the United States mails in the same manner and on the same conditions as the executive departments;

(8) may contract with individuals for personal services, who shall not be considered Federal employees for any provision of law administered by the Office of Personnel Management;

(9) may hire or obtain passenger motor vehicles; and

(10) shall have such other powers as may be necessary and incident to carrying out this subtitle.

(b) **PRINCIPAL OFFICE.**—The Foundation shall maintain its principal office in the metropolitan area of Washington, District of Columbia.

(c) **APPLICABILITY OF GOVERNMENT CORPORATION CONTROL ACT.**—

(1) **IN GENERAL.**—The Foundation shall be subject to chapter 91 of subtitle VI of title 31, United States Code, except that the Foundation shall not be authorized to issue obligations or offer obligations to the public.

(2) **CONFORMING AMENDMENT.**—Section 9101(3) of title 31, United States Code, is amended by adding at the end the following:

“(R) the International Clean Energy Foundation.”.

(d) **INSPECTOR GENERAL.**—

(1) **IN GENERAL.**—The Inspector General of the Department of State shall serve as Inspector General of the Foundation, and, in acting in such capacity, may conduct reviews, inves-

tigations, and inspections of all aspects of the operations and activities of the Foundation.

(2) **AUTHORITY OF THE BOARD.**—In carrying out the responsibilities under this subsection, the Inspector General shall report to and be under the general supervision of the Board.

(3) **REIMBURSEMENT AND AUTHORIZATION OF SERVICES.**—

(A) **REIMBURSEMENT.**—The Foundation shall reimburse the Department of State for all expenses incurred by the Inspector General in connection with the Inspector General's responsibilities under this subsection.

(B) **AUTHORIZATION FOR SERVICES.**—Of the amount authorized to be appropriated under section 927(a) for a fiscal year, up to \$500,000 is authorized to be made available to the Inspector General of the Department of State to conduct reviews, investigations, and inspections of operations and activities of the Foundation.

SEC. 926. [42 U.S.C. 17356] GENERAL PERSONNEL AUTHORITIES.

(a) **DETAIL OF PERSONNEL.**—Upon request of the Chief Executive Officer, the head of an agency may detail any employee of such agency to the Foundation on a reimbursable basis. Any employee so detailed remains, for the purpose of preserving such employee's allowances, privileges, rights, seniority, and other benefits, an employee of the agency from which detailed.

(b) **REEMPLOYMENT RIGHTS.**—

(1) **IN GENERAL.**—An employee of an agency who is serving under a career or career conditional appointment (or the equivalent), and who, with the consent of the head of such agency, transfers to the Foundation, is entitled to be reemployed in such employee's former position or a position of like seniority, status, and pay in such agency, if such employee—

(A) is separated from the Foundation for any reason, other than misconduct, neglect of duty, or malfeasance; and

(B) applies for reemployment not later than 90 days after the date of separation from the Foundation.

(2) **SPECIFIC RIGHTS.**—An employee who satisfies paragraph (1) is entitled to be reemployed (in accordance with such paragraph) within 30 days after applying for reemployment and, on reemployment, is entitled to at least the rate of basic pay to which such employee would have been entitled had such employee never transferred.

(c) **HIRING AUTHORITY.**—Of persons employed by the Foundation, no more than 30 persons may be appointed, compensated, or removed without regard to the civil service laws and regulations.

(d) **BASIC PAY.**—The Chief Executive Officer may fix the rate of basic pay of employees of the Foundation without regard to the provisions of chapter 51 of title 5, United States Code (relating to the classification of positions), subchapter III of chapter 53 of such title (relating to General Schedule pay rates), except that no employee of the Foundation may receive a rate of basic pay that exceeds the rate for level IV of the Executive Schedule under section 5315 of such title.

(e) **DEFINITIONS.**—In this section—

(1) the term “agency” means an executive agency, as defined by section 105 of title 5, United States Code; and

(2) the term “detail” means the assignment or loan of an employee, without a change of position, from the agency by which such employee is employed to the Foundation.

SEC. 927. [42 U.S.C. 17357] AUTHORIZATION OF APPROPRIATIONS.

(a) **AUTHORIZATION OF APPROPRIATIONS.**—To carry out this subtitle, there are authorized to be appropriated \$20,000,000 for each of the fiscal years 2009 through 2013.

(b) **ALLOCATION OF FUNDS.**—

(1) **IN GENERAL.**—The Foundation may allocate or transfer to any agency of the United States Government any of the funds available for carrying out this subtitle. Such funds shall be available for obligation and expenditure for the purposes for which the funds were authorized, in accordance with authority granted in this subtitle or under authority governing the activities of the United States Government agency to which such funds are allocated or transferred.

(2) **NOTIFICATION.**—The Foundation shall notify the appropriate congressional committees not less than 15 days prior to an allocation or transfer of funds pursuant to paragraph (1).

Subtitle C—Miscellaneous Provisions

SEC. 931. [42 U.S.C. 17371] ENERGY DIPLOMACY AND SECURITY WITHIN THE DEPARTMENT OF STATE.

(a) **STATE DEPARTMENT COORDINATOR FOR INTERNATIONAL ENERGY AFFAIRS.**—

(1) **IN GENERAL.**—The Secretary of State should ensure that energy security is integrated into the core mission of the Department of State.

(2) **COORDINATOR FOR INTERNATIONAL ENERGY AFFAIRS.**—There is established within the Office of the Secretary of State a Coordinator for International Energy Affairs, who shall be responsible for—

(A) representing the Secretary of State in interagency efforts to develop the international energy policy of the United States;

(B) ensuring that analyses of the national security implications of global energy and environmental developments are reflected in the decision making process within the Department of State;

(C) incorporating energy security priorities into the activities of the Department of State;

(D) coordinating energy activities of the Department of State with relevant Federal agencies; and

(E) coordinating energy security and other relevant functions within the Department of State currently undertaken by offices within—

(i) the Bureau of Economic, Energy and Business Affairs;

(ii) the Bureau of Oceans and International Environmental and Scientific Affairs; and

(iii) other offices within the Department of State.

(3) AUTHORIZATION OF APPROPRIATIONS.—There are authorized to be appropriated such sums as may be necessary to carry out this subsection.

(b) ENERGY EXPERTS IN KEY EMBASSIES.—Not later than 180 days after the date of the enactment of this Act, the Secretary of State shall submit a report to the Committee on Foreign Relations of the Senate and the Committee on Foreign Affairs of the House of Representatives that includes—

(1) a description of the Department of State personnel who are dedicated to energy matters and are stationed at embassies and consulates in countries that are major energy producers or consumers;

(2) an analysis of the need for Federal energy specialist personnel in United States embassies and other United States diplomatic missions; and

(3) recommendations for increasing energy expertise within United States embassies among foreign service officers and options for assigning to such embassies energy attachés from the National Laboratories or other agencies within the Department of Energy.

(c) ENERGY ADVISORS.—The Secretary of Energy may make appropriate arrangements with the Secretary of State to assign personnel from the Department of Energy or the National Laboratories of the Department of Energy to serve as dedicated advisors on energy matters in embassies of the United States or other United States diplomatic missions.

(d) REPORT.—Not later than 180 days after the date of the enactment of this Act, and every 2 years thereafter for the following 20 years, the Secretary of State shall submit a report to the Committee on Foreign Relations of the Senate and the Committee on Foreign Affairs of the House of Representatives that describes—

(1) the energy-related activities being conducted by the Department of State, including activities within—

(A) the Bureau of Economic, Energy and Business Affairs;

(B) the Bureau of Oceans and Environmental and Scientific Affairs; and

(C) other offices within the Department of State;

(2) the amount of funds spent on each activity within each office described in paragraph (1); and

(3) the number and qualification of personnel in each embassy (or relevant foreign posting) of the United States whose work is dedicated exclusively to energy matters.

SEC. 932. NATIONAL SECURITY COUNCIL REORGANIZATION.

Section 101(a) of the National Security Act of 1947 (50 U.S.C. 402(a)) is amended—

(1) by redesignating paragraphs (5), (6), and (7) as paragraphs (6), (7), and (8), respectively; and

(2) by inserting after paragraph (4) the following:

“(5) the Secretary of Energy;”.

SEC. 933. [42 U.S.C. 17372] ANNUAL NATIONAL ENERGY SECURITY STRATEGY REPORT.

(a) **REPORTS.**—

(1) **IN GENERAL.**—Subject to paragraph (2), on the date on which the President submits to Congress the budget for the following fiscal year under section 1105 of title 31, United States Code, the President shall submit to Congress a comprehensive report on the national energy security of the United States.

(2) **NEW PRESIDENTS.**—In addition to the reports required under paragraph (1), the President shall submit a comprehensive report on the national energy security of the United States by not later than 150 days after the date on which the President assumes the office of President after a presidential election.

(b) **CONTENTS.**—Each report under this section shall describe the national energy security strategy of the United States, including a comprehensive description of—

(1) the worldwide interests, goals, and objectives of the United States that are vital to the national energy security of the United States;

(2) the foreign policy, worldwide commitments, and national defense capabilities of the United States necessary—

(A) to deter political manipulation of world energy resources; and

(B) to implement the national energy security strategy of the United States;

(3) the proposed short-term and long-term uses of the political, economic, military, and other authorities of the United States—

(A) to protect or promote energy security; and

(B) to achieve the goals and objectives described in paragraph (1);

(4) the adequacy of the capabilities of the United States to protect the national energy security of the United States, including an evaluation of the balance among the capabilities of all elements of the national authority of the United States to support the implementation of the national energy security strategy; and

(5) such other information as the President determines to be necessary to inform Congress on matters relating to the national energy security of the United States.

(c) **CLASSIFIED AND UNCLASSIFIED FORM.**—Each national energy security strategy report shall be submitted to Congress in—

(1) a classified form; and

(2) an unclassified form.

SEC. 934. [42 U.S.C. 17373] CONVENTION ON SUPPLEMENTARY COMPENSATION FOR NUCLEAR DAMAGE CONTINGENT COST ALLOCATION.

(a) **FINDINGS AND PURPOSE.**—

(1) **FINDINGS.**—Congress finds that—

(A) section 170 of the Atomic Energy Act of 1954 (42 U.S.C. 2210) (commonly known as the “Price-Anderson Act”)—

(i) provides a predictable legal framework necessary for nuclear projects; and

(ii) ensures prompt and equitable compensation in the event of a nuclear incident in the United States;

(B) the Price-Anderson Act, in effect, provides operators of nuclear powerplants with insurance for damage arising out of a nuclear incident and funds the insurance primarily through the assessment of a retrospective premium from each operator after the occurrence of a nuclear incident;

(C) the Convention on Supplementary Compensation for Nuclear Damage, done at Vienna on September 12, 1997, will establish a global system—

(i) to provide a predictable legal framework necessary for nuclear energy projects; and

(ii) to ensure prompt and equitable compensation in the event of a nuclear incident;

(D) the Convention benefits United States nuclear suppliers that face potentially unlimited liability for nuclear incidents that are not covered by the Price-Anderson Act by replacing a potentially open-ended liability with a predictable liability regime that, in effect, provides nuclear suppliers with insurance for damage arising out of such an incident;

(E) the Convention also benefits United States nuclear facility operators that may be publicly liable for a Price-Anderson incident by providing an additional early source of funds to compensate damage arising out of the Price-Anderson incident;

(F) the combined operation of the Convention, the Price-Anderson Act, and this section will augment the quantity of assured funds available for victims in a wider variety of nuclear incidents while reducing the potential liability of United States suppliers without increasing potential costs to United States operators;

(G) the cost of those benefits is the obligation of the United States to contribute to the supplementary compensation fund established by the Convention;

(H) any such contribution should be funded in a manner that does not—

(i) upset settled expectations based on the liability regime established under the Price-Anderson Act; or

(ii) shift to Federal taxpayers liability risks for nuclear incidents at foreign installations;

(I) with respect to a Price-Anderson incident, funds already available under the Price-Anderson Act should be used; and

(J) with respect to a nuclear incident outside the United States not covered by the Price-Anderson Act, a retrospective premium should be prorated among nuclear suppliers relieved from potential liability for which insurance is not available.

(2) PURPOSE.—The purpose of this section is to allocate the contingent costs associated with participation by the United

States in the international nuclear liability compensation system established by the Convention on Supplementary Compensation for Nuclear Damage, done at Vienna on September 12, 1997—

(A) with respect to a Price-Anderson incident, by using funds made available under section 170 of the Atomic Energy Act of 1954 (42 U.S.C. 2210) to cover the contingent costs in a manner that neither increases the burdens nor decreases the benefits under section 170 of that Act; and

(B) with respect to a covered incident outside the United States that is not a Price-Anderson incident, by allocating the contingent costs equitably, on the basis of risk, among the class of nuclear suppliers relieved by the Convention from the risk of potential liability resulting from any covered incident outside the United States.

(b) DEFINITIONS.—In this section:

(1) COMMISSION.—The term “Commission” means the Nuclear Regulatory Commission.

(2) CONTINGENT COST.—The term “contingent cost” means the cost to the United States in the event of a covered incident the amount of which is equal to the amount of funds the United States is obligated to make available under paragraph 1(b) of Article III of the Convention.

(3) CONVENTION.—The term “Convention” means the Convention on Supplementary Compensation for Nuclear Damage, done at Vienna on September 12, 1997.

(4) COVERED INCIDENT.—The term “covered incident” means a nuclear incident the occurrence of which results in a request for funds pursuant to Article VII of the Convention.

(5) COVERED INSTALLATION.—The term “covered installation” means a nuclear installation at which the occurrence of a nuclear incident could result in a request for funds under Article VII of the Convention.

(6) COVERED PERSON.—

(A) IN GENERAL.—The term “covered person” means—

(i) a United States person; and
(ii) an individual or entity (including an agency or instrumentality of a foreign country) that—

(I) is located in the United States; or

(II) carries out an activity in the United States.

(B) EXCLUSIONS.—The term “covered person” does not include—

(i) the United States; or

(ii) any agency or instrumentality of the United States.

(7) NUCLEAR SUPPLIER.—The term “nuclear supplier” means a covered person (or a successor in interest of a covered person) that—

(A) supplies facilities, equipment, fuel, services, or technology pertaining to the design, construction, operation, or decommissioning of a covered installation; or

(B) transports nuclear materials that could result in a covered incident.

(8) PRICE-ANDERSON INCIDENT.—The term “Price-Anderson incident” means a covered incident for which section 170 of the Atomic Energy Act of 1954 (42 U.S.C. 2210) would make funds available to compensate for public liability (as defined in section 11 of that Act (42 U.S.C. 2014)).

(9) SECRETARY.—The term “Secretary” means the Secretary of Energy.

(10) UNITED STATES.—

(A) IN GENERAL.—The term “United States” has the meaning given the term in section 11 of the Atomic Energy Act of 1954 (42 U.S.C. 2014).

(B) INCLUSIONS.—The term “United States” includes—

(i) the Commonwealth of Puerto Rico;

(ii) any other territory or possession of the United States;

(iii) the Canal Zone; and

(iv) the waters of the United States territorial sea under Presidential Proclamation Number 5928, dated December 27, 1988 (43 U.S.C. 1331 note).

(11) UNITED STATES PERSON.—The term “United States person” means—

(A) any individual who is a resident, national, or citizen of the United States (other than an individual residing outside of the United States and employed by a person who is not a United States person); and

(B) any corporation, partnership, association, joint stock company, business trust, unincorporated organization, or sole proprietorship that is organized under the laws of the United States.

(c) USE OF PRICE-ANDERSON FUNDS.—

(1) IN GENERAL.—Funds made available under section 170 of the Atomic Energy Act of 1954 (42 U.S.C. 2210) shall be used to cover the contingent cost resulting from any Price-Anderson incident.

(2) EFFECT.—The use of funds pursuant to paragraph (1) shall not reduce the limitation on public liability established under section 170 e. of the Atomic Energy Act of 1954 (42 U.S.C. 2210(e)).

(d) EFFECT ON AMOUNT OF PUBLIC LIABILITY.—

(1) IN GENERAL.—Funds made available to the United States under Article VII of the Convention with respect to a Price-Anderson incident shall be used to satisfy public liability resulting from the Price-Anderson incident.

(2) AMOUNT.—The amount of public liability allowable under section 170 of the Atomic Energy Act of 1954 (42 U.S.C. 2210) relating to a Price-Anderson incident under paragraph (1) shall be increased by an amount equal to the difference between—

(A) the amount of funds made available for the Price-Anderson incident under Article VII of the Convention; and

(B) the amount of funds used under subsection (c) to cover the contingent cost resulting from the Price-Anderson incident.

(e) RETROSPECTIVE RISK POOLING PROGRAM.—

(1) IN GENERAL.—Except as provided under paragraph (2), each nuclear supplier shall participate in a retrospective risk pooling program in accordance with this section to cover the contingent cost resulting from a covered incident outside the United States that is not a Price-Anderson incident.

(2) DEFERRED PAYMENT.—

(A) IN GENERAL.—The obligation of a nuclear supplier to participate in the retrospective risk pooling program shall be deferred until the United States is called on to provide funds pursuant to Article VII of the Convention with respect to a covered incident that is not a Price-Anderson incident.

(B) AMOUNT OF DEFERRED PAYMENT.—The amount of a deferred payment of a nuclear supplier under subparagraph (A) shall be based on the risk-informed assessment formula determined under subparagraph (C).

(C) RISK-INFORMED ASSESSMENT FORMULA.—

(i) IN GENERAL.—Not later than 3 years after the date of the enactment of this Act, and every 5 years thereafter, the Secretary shall, by regulation, determine the risk-informed assessment formula for the allocation among nuclear suppliers of the contingent cost resulting from a covered incident that is not a Price-Anderson incident, taking into account risk factors such as—

(I) the nature and intended purpose of the goods and services supplied by each nuclear supplier to each covered installation outside the United States;

(II) the quantity of the goods and services supplied by each nuclear supplier to each covered installation outside the United States;

(III) the hazards associated with the supplied goods and services if the goods and services fail to achieve the intended purposes;

(IV) the hazards associated with the covered installation outside the United States to which the goods and services are supplied;

(V) the legal, regulatory, and financial infrastructure associated with the covered installation outside the United States to which the goods and services are supplied; and

(VI) the hazards associated with particular forms of transportation.

(ii) FACTORS FOR CONSIDERATION.—In determining the formula, the Secretary may—

(I) exclude—

(aa) goods and services with negligible risk;

(bb) classes of goods and services not intended specifically for use in a nuclear installation;

(cc) a nuclear supplier with a de minimis share of the contingent cost; and

(dd) a nuclear supplier no longer in existence for which there is no identifiable successor; and

(II) establish the period on which the risk assessment is based.

(iii) APPLICATION.—In applying the formula, the Secretary shall not consider any covered installation or transportation for which funds would be available under section 170 of the Atomic Energy Act of 1954 (42 U.S.C. 2210).

(iv) REPORT.—Not later than 5 years after the date of the enactment of this Act, and every 5 years thereafter, the Secretary shall submit to the Committee on Environment and Public Works of the Senate and the Committee on Energy and Commerce of the House of Representatives, a report on whether there is a need for continuation or amendment of this section, taking into account the effects of the implementation of the Convention on the United States nuclear industry and suppliers.

(f) REPORTING.—

(1) COLLECTION OF INFORMATION.—

(A) IN GENERAL.—The Secretary may collect information necessary for developing and implementing the formula for calculating the deferred payment of a nuclear supplier under subsection (e)(2).

(B) PROVISION OF INFORMATION.—Each nuclear supplier and other appropriate persons shall make available to the Secretary such information, reports, records, documents, and other data as the Secretary determines, by regulation, to be necessary or appropriate to develop and implement the formula under subsection (e)(2)(C).

(2) PRIVATE INSURANCE.—The Secretary shall make available to nuclear suppliers, and insurers of nuclear suppliers, information to support the voluntary establishment and maintenance of private insurance against any risk for which nuclear suppliers may be required to pay deferred payments under this section.

(g) EFFECT ON LIABILITY.—Nothing in any other law (including regulations) limits liability for a covered incident to an amount equal to less than the amount prescribed in paragraph 1(a) of Article IV of the Convention, unless the law—

(1) specifically refers to this section; and

(2) explicitly repeals, alters, amends, modifies, impairs, displaces, or supersedes the effect of this subsection.

(h) PAYMENTS TO AND BY THE UNITED STATES.—

(1) ACTION BY NUCLEAR SUPPLIERS.—

(A) NOTIFICATION.—In the case of a request for funds under Article VII of the Convention resulting from a covered incident that is not a Price-Anderson incident, the Secretary shall notify each nuclear supplier of the amount

of the deferred payment required to be made by the nuclear supplier.

(B) PAYMENTS.—

(i) IN GENERAL.—Except as provided under clause (ii), not later than 60 days after receipt of a notification under subparagraph (A), a nuclear supplier shall pay to the general fund of the Treasury the deferred payment of the nuclear supplier required under subparagraph (A).

(ii) ANNUAL PAYMENTS.—A nuclear supplier may elect to prorate payment of the deferred payment required under subparagraph (A) in 5 equal annual payments (including interest on the unpaid balance at the prime rate prevailing at the time the first payment is due).

(C) VOUCHERS.—A nuclear supplier shall submit payment certification vouchers to the Secretary of the Treasury in accordance with section 3325 of title 31, United States Code.

(2) USE OF FUNDS.—

(A) IN GENERAL.—Amounts paid into the Treasury under paragraph (1) shall be available to the Secretary of the Treasury, without further appropriation and without fiscal year limitation, for the purpose of making the contributions of public funds required to be made by the United States under the Convention.

(B) ACTION BY SECRETARY OF TREASURY.—The Secretary of the Treasury shall pay the contribution required under the Convention to the court of competent jurisdiction under Article XIII of the Convention with respect to the applicable covered incident.

(3) FAILURE TO PAY.—If a nuclear supplier fails to make a payment required under this subsection, the Secretary may take appropriate action to recover from the nuclear supplier—

(A) the amount of the payment due from the nuclear supplier;

(B) any applicable interest on the payment; and

(C) a penalty of not more than twice the amount of the deferred payment due from the nuclear supplier.

(i) LIMITATION ON JUDICIAL REVIEW; CAUSE OF ACTION.—

(1) LIMITATION ON JUDICIAL REVIEW.—

(A) IN GENERAL.—In any civil action arising under the Convention over which Article XIII of the Convention grants jurisdiction to the courts of the United States, any appeal or review by writ of mandamus or otherwise with respect to a nuclear incident that is not a Price-Anderson incident shall be in accordance with chapter 83 of title 28, United States Code, except that the appeal or review shall occur in the United States Court of Appeals for the District of Columbia Circuit.

(B) SUPREME COURT JURISDICTION.—Nothing in this paragraph affects the jurisdiction of the Supreme Court of the United States under chapter 81 of title 28, United States Code.

(2) CAUSE OF ACTION.—

(A) IN GENERAL.—Subject to subparagraph (B), in any civil action arising under the Convention over which Article XIII of the Convention grants jurisdiction to the courts of the United States, in addition to any other cause of action that may exist, an individual or entity shall have a cause of action against the operator to recover for nuclear damage suffered by the individual or entity.

(B) REQUIREMENT.—Subparagraph (A) shall apply only if the individual or entity seeks a remedy for nuclear damage (as defined in Article I of the Convention) that was caused by a nuclear incident (as defined in Article I of the Convention) that is not a Price-Anderson incident.

(C) SAVINGS PROVISION.—Nothing in this paragraph may be construed to limit, modify, extinguish, or otherwise affect any cause of action that would have existed in the absence of enactment of this paragraph.

(j) RIGHT OF RECOURSE.—This section does not provide to an operator of a covered installation any right of recourse under the Convention.

(k) PROTECTION OF SENSITIVE UNITED STATES INFORMATION.—Nothing in the Convention or this section requires the disclosure of—

(1) any data that, at any time, was Restricted Data (as defined in section 11 of the Atomic Energy Act of 1954 (42 U.S.C. 2014));

(2) information relating to intelligence sources or methods protected by section 102A(i) of the National Security Act of 1947 (50 U.S.C. 403-1(i)); or

(3) national security information classified under Executive Order 12958 (50 U.S.C. 435 note; relating to classified national security information) (or a successor Executive Order or regulation).

(l) REGULATIONS.—

(1) IN GENERAL.—The Secretary or the Commission, as appropriate, may prescribe regulations to carry out section 170 of the Atomic Energy Act of 1954 (42 U.S.C. 2210) and this section.

(2) REQUIREMENT.—Rules prescribed under this subsection shall ensure, to the maximum extent practicable, that—

(A) the implementation of section 170 of the Atomic Energy Act of 1954 (42 U.S.C. 2210) and this section is consistent and equitable; and

(B) the financial and operational burden on a Commission licensee in complying with section 170 of that Act is not greater as a result of the enactment of this section.

(3) APPLICABILITY OF PROVISION.—Section 553 of title 5, United States Code, shall apply with respect to the promulgation of regulations under this subsection.

(4) EFFECT OF SUBSECTION.—The authority provided under this subsection is in addition to, and does not impair or otherwise affect, any other authority of the Secretary or the Commission to prescribe regulations.

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(m) **EFFECTIVE DATE.**—This section shall take effect on the date of the enactment of this Act.

SEC. 935. [42 U.S.C. 17374] TRANSPARENCY IN EXTRACTIVE INDUSTRIES RESOURCE PAYMENTS.

(a) **PURPOSE.**—The purpose of this section is to—

(1) ensure greater United States energy security by combating corruption in the governments of foreign countries that receive revenues from the sale of their natural resources; and

(2) enhance the development of democracy and increase political and economic stability in such resource rich foreign countries.

(b) **STATEMENT OF POLICY.**—It is the policy of the United States—

(1) to increase energy security by promoting anti-corruption initiatives in oil and natural gas rich countries; and

(2) to promote global energy security through promotion of programs such as the Extractive Industries Transparency Initiative (EITI) that seek to instill transparency and accountability into extractive industries resource payments.

(c) **SENSE OF CONGRESS.**—It is the sense of Congress that the United States should further global energy security and promote democratic development in resource-rich foreign countries by—

(1) encouraging further participation in the EITI by eligible countries and companies; and

(2) promoting the efficacy of the EITI program by ensuring a robust and candid review mechanism.

(d) **REPORT.**—

(1) **REPORT REQUIRED.**—Not later than 180 days after the date of the enactment of this Act, and annually thereafter, the Secretary of State, in consultation with the Secretary of Energy, shall submit to the appropriate congressional committees a report on progress made in promoting transparency in extractive industries resource payments.

(2) **MATTERS TO BE INCLUDED.**—The report required by paragraph (1) shall include a detailed description of United States participation in the EITI, bilateral and multilateral diplomatic efforts to further participation in the EITI, and other United States initiatives to strengthen energy security, deter energy kleptocracy, and promote transparency in the extractive industries.

(e) **AUTHORIZATION OF APPROPRIATIONS.**—There is authorized to be appropriated \$3,000,000 for the purposes of United States contributions to the Multi-Donor Trust Fund of the EITI.

SEC. 936. [42 U.S.C. 17375] REGIONAL CLEAN ENERGY INNOVATION PROGRAM.

(a) **DEFINITIONS.**—In this section:

(1) **REGIONAL CLEAN ENERGY INNOVATION PARTNERSHIP.**—The term “regional clean energy innovation partnership” means a group of one or more persons, including a covered consortium, who perform a collection of activities that are coordinated by such covered consortium to carry out the purposes of the program under subsection (c) in a region of the United States.

(2) COVERED CONSORTIUM.—The term “covered consortium” means an individual or group of individuals in partnership with a government entity, including a State, territorial, local, or tribal government or unit of such government, and at least 2 or more of the following additional entities—

(A) an institution of higher education or a consortium of institutions of higher education, including community colleges;

(B) a workforce development program;

(C) a private sector entity or group of entities, including a trade or industry association;

(D) a nonprofit organization;

(E) a community group or community-based organization;

(F) a labor organization or joint labor-management organization;

(G) a National Laboratory;

(H) a venture development organization;

(I) a community development financial institution or minority depository institution;

(J) a worker cooperative membership association or state or local employee ownership or cooperative development center;

(K) an organization focused on clean energy technology innovation or entrepreneurship;

(L) a business or clean energy accelerator or incubator;

(M) an economic development organization;

(N) a manufacturing facility or organization;

(O) a multi-institutional collaboration; or

(P) any other entity that the Secretary determines to be relevant.

(3) PROGRAM.—The term “program” means the Regional Clean Energy Innovation Program authorized in subsection (b).

(4) INSTITUTION OF HIGHER EDUCATION.—The term “institution of higher education” has the meaning given such term in section 101 or 102(a)(1)(B) of the Higher Education Act of 1965, as amended (20 U.S.C. 1001, 1002(a)(1)(B)).

(5) NATIONAL LABORATORY.—The term “National Laboratory” has the meaning given that term in section 2 of the Energy Policy Act of 2005 (42 U.S.C. 15801).

(6) CLEAN ENERGY TECHNOLOGY.—The term “clean energy technology” means a technology that significantly reduces energy use, increases energy efficiency, reduces greenhouse gas emissions, reduces emissions of other pollutants, or mitigates other negative environmental consequences of energy production, transmission or use.

(7) COMMUNITY-BASED ORGANIZATION.—The term “community-based organization” has the meaning given the term in section 3 of the Workforce Innovation and Opportunity Act (29 U.S.C. 3102).

(8) COMMUNITY COLLEGE.—The term “community college” means—

(A) a public institution of higher education, including additional locations, at which the highest degree, or the predominantly awarded degree, is an associate degree; or

(B) any Tribal college or university (as defined in section 316 of the Higher Education Act of 1965 (20 U.S.C. 1059c)).

(9) WORKFORCE DEVELOPMENT PROGRAM.—The term “workforce development program” has the meaning given the term in section 3 of the Workforce Innovation and Opportunity Act (29 U.S.C. 3102).

(b) IN GENERAL.—The Secretary shall establish a Regional Clean Energy Innovation Program, a research, development, demonstration, and commercial application program designed to enhance the economic, environmental, and energy security of the United States and accelerate the pace of innovation of diverse clean energy technologies through the formation or support of regional clean energy innovation partnerships.

(c) PURPOSES OF THE PROGRAM.—The purposes of the Program established under subsection (b) are to—

(1) improve the competitiveness of United States’ clean energy technology research, development, demonstration, and commercial application; and

(2) support the development of tools and technologies best suited for use in diverse regions of the United States, including in rural, tribal, and low-income communities.

(d) REGIONAL CLEAN ENERGY INNOVATION PARTNERSHIPS.—

(1) IN GENERAL.—The Secretary shall competitively award grants to covered consortia to establish or support regional clean energy innovation partnerships that achieve the purposes of the Program in subsection (c).

(2) PERMISSIBLE ACTIVITIES.—Grants awarded under this subsection shall be used for activities determined appropriate by the Secretary to achieve the purposes of the Program in subsection (c), including—

(A) facilitating the commercial application of clean energy products, processes, and services, including through research, development, demonstration, or technology transfer;

(B) planning among participants of a regional clean energy innovation partnership to improve the strategic and cost-effective coordination of the partnership;

(C) improving stakeholder involvement in the development of goals and activities of a regional clean energy innovation partnership;

(D) assessing different incentive mechanisms for clean energy development and commercial application in the region;

(E) hosting events and conferences; and

(F) establishing and updating roadmaps to measure progress on relevant goals, such as those relevant to metrics developed under subsection (g).

(3) APPLICATIONS.—Each application submitted to the Secretary under paragraph (1) may include—

(A) a list of members and roles of members of the covered consortia, as well as any other stakeholders supporting the activities of the regional clean energy innovation partnership;

(B) an assessment of the relevant clean energy innovation assets needed in a region to achieve proposed outcomes, such as education and workforce development programs, research facilities, infrastructure or site development, access to capital, manufacturing capabilities, or other assets;

(C) a description of proposed activities that the regional clean energy innovation partnership plans to undertake and how the proposed activities will achieve the purposes described in subsection (c);

(D) a plan for attracting additional funds and identification of funding sources from non-Federal sources to deliver the proposed outcomes of the regional clean energy innovation partnership;

(E) a plan for partnering and collaborating with community development financial institutions and minority depository institutions, labor organizations and community groups, worker cooperative membership associations, local and state employee ownership and cooperative development centers, and other local institutions in order to promote employee, community, and public ownership in the clean energy sector, and advance models of local economic development that build and retain wealth in the region;

(F) a plan for sustaining activities of the regional clean energy innovation partnership after funds received under this program have been expended; and

(G) a proposed budget, including financial contributions from non-Federal sources.

(4) CONSIDERATIONS.—In selecting covered consortia for funding under the Program, the Secretary shall, to the maximum extent practicable—

(A) give special consideration to applications from rural, tribal, and low-income communities; and

(B) ensure that there is geographic diversity among the covered consortia selected to receive funding.

(5) AWARD AMOUNT.—Grants given out under this Program shall be in an amount not greater than \$10,000,000, with the total grant award in any year less than that in the previous year.

(6) COST SHARE.—For grants that are disbursed over the course of three or more years, the Secretary shall require, as a condition of receipt of funds under this section, that a covered consortium provide not less than 50 percent of the funding for the activities of the regional clean energy partnership under this section for years 3, 4, and 5.

(7) DURATION.—Each grant under paragraph shall be for a period of not longer than 5 years.

(8) RENEWAL.—A grant awarded under this section may be renewed for a period of not more than 5 years, subject to a rigorous merit review based on the progress of a regional clean

energy innovation partnership towards achieving the purposes of the program in subsection (c) and the metrics developed under subsection (g).

(9) **TERMINATION.**—Consistent with the existing authorities of the Department, the Secretary may terminate grant funding under this subsection to covered consortia during the performance period if the Secretary determines that the regional clean energy innovation partnership is underperforming.

(10) **ADMINISTRATIVE COSTS.**—The Secretary may allow a covered consortium that receives funds under this section to allocate a portion of the funding received to be used for administrative or indirect costs.

(11) **FUNDING.**—The Secretary may accept funds from other Federal agencies to support funding and activities under this section.

(e) **PLANNING FUNDS.**—The Secretary may competitively award grants in an amount no greater than \$2,000,000 for a period not longer than 2 years to an entity consisting of a government entity, including a State, territorial, local, or tribal government or unit of such government or any entity listed under subsection (a)(2) to plan a regional clean energy innovation partnership or establish a covered consortium for the purpose of applying for funds under subsection (b).

(f) **INFORMATION SHARING.**—As part of the program, the Secretary shall support the gathering, analysis, and dissemination of information on best practices for developing and operating successful regional clean energy innovation partnerships.

(g) **METRICS.**—In evaluating a grant renewal under subsection (d)(8), the Secretary shall work with program evaluation experts to develop and make publicly available metrics to assess the progress of a regional clean energy innovation partnership towards achieving the purposes of the program in subsection (c).

(h) **COORDINATION.**—In carrying out the program, the Secretary shall coordinate with, and avoid unnecessary duplication of, the activities carried out under this section with the activities of other research entities of the Department or relevant programs at other Federal agencies.

(i) **CONFLICTS OF INTEREST.**—In carrying out the program, the Secretary shall maintain conflict of interest procedures, consistent with the conflict of interest procedures of the Department.

(j) **EVALUATION BY COMPTROLLER GENERAL.**—Not later than 3 years after the date of the enactment of the Research and Development, Competition, and Innovation Act, and again 3 years later, the Comptroller General 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 an evaluation on the operation of the program during the most recent 3-year period, including—

(1) an assessment of the progress made towards achieving the purposes specified in subsection (c) based on the metrics developed under subsection (g);

(2) the short-term and long-term metrics used to determine the success of the program under subsection (g), and any changes recommended to the metrics used;

(3) the regional clean energy innovation partnerships established or supported by covered consortia that have received grants under subsection (d); and

(4) any recommendations on how the program may be improved.

(k) NATIONAL LABORATORIES.—In supporting technology transfer activities at the National Laboratories, the Secretary shall encourage partnerships with entities that are located in the same region or State as the National Laboratory.

(l) SECURITY.—In carrying out the activities under this section, the Secretary shall ensure proper security controls are in place to protect sensitive information, as appropriate.

(m) NO FUNDS FOR CONSTRUCTION.—No funds provided to the Department of Energy under this section shall be used for construction.

(n) AUTHORIZATION OF APPROPRIATIONS.—There are authorized to be appropriated to the Secretary to carry out this section \$50,000,000 for each of fiscal years 2023 through 2027.

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TITLE XIII—SMART GRID

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SEC. 1303. [42 U.S.C. 17383] SMART GRID ADVISORY COMMITTEE AND SMART GRID TASK FORCE.

(a) SMART GRID ADVISORY COMMITTEE.—

(1) ESTABLISHMENT.—The Secretary shall establish, within 90 days of enactment of this Part, a Smart Grid Advisory Committee (either as an independent entity or as a designated subpart of a larger advisory committee on electricity matters). The Smart Grid Advisory Committee shall include eight or more members appointed by the Secretary who have sufficient experience and expertise to represent the full range of smart grid technologies and services, to represent both private and non-Federal public sector stakeholders. One member shall be appointed by the Secretary to Chair the Smart Grid Advisory Committee.

(2) MISSION.—The mission of the Smart Grid Advisory Committee shall be to advise the Secretary, the Assistant Secretary, and other relevant Federal officials concerning the development of smart grid technologies, the progress of a national transition to the use of smart-grid technologies and services, the evolution of widely-accepted technical and practical standards and protocols to allow interoperability and intercommunication among smart-grid capable devices, and the optimum means of using Federal incentive authority to encourage such progress.

(3) APPLICABILITY OF CHAPTER 10 OF TITLE 5, UNITED STATES CODE.—Chapter 10 of title 5, United States Code, shall apply to the Smart Grid Advisory Committee.

(b) SMART GRID TASK FORCE.—

(1) ESTABLISHMENT.—The Assistant Secretary of the Office of Electricity Delivery and Energy Reliability shall establish,

within 90 days of enactment of this Part, a Smart Grid Task Force composed of designated employees from the various divisions of that office who have responsibilities related to the transition to smart-grid technologies and practices. The Assistant Secretary or his designee shall be identified as the Director of the Smart Grid Task Force. The Chairman of the Federal Energy Regulatory Commission and the Director of the National Institute of Standards and Technology shall each designate at least one employee to participate on the Smart Grid Task Force. Other members may come from other agencies at the invitation of the Assistant Secretary or the nomination of the head of such other agency. The Smart Grid Task Force shall, without disrupting the work of the Divisions or Offices from which its members are drawn, provide an identifiable Federal entity to embody the Federal role in the national transition toward development and use of smart grid technologies.

(2) MISSION.—The mission of the Smart Grid Task Force shall be to insure awareness, coordination and integration of the diverse activities of the Office and elsewhere in the Federal Government related to smart-grid technologies and practices, including but not limited to: smart grid research and development; development of widely accepted smart-grid standards and protocols; the relationship of smart-grid technologies and practices to electric utility regulation; the relationship of smart-grid technologies and practices to infrastructure development, system reliability and security; and the relationship of smart-grid technologies and practices to other facets of electricity supply, demand, transmission, distribution, and policy. The Smart Grid Task Force shall collaborate with the Smart Grid Advisory Committee and other Federal agencies and offices. The Smart Grid Task Force shall meet at the call of its Director as necessary to accomplish its mission.

(c) AUTHORIZATION.—There are authorized to be appropriated for the purposes of this section such sums as are necessary to the Secretary to support the operations of the Smart Grid Advisory Committee and Smart Grid Task Force for each of fiscal years 2008 through 2020.

SEC. 1304. [42 U.S.C. 17384] SMART GRID TECHNOLOGY RESEARCH, DEVELOPMENT, AND DEMONSTRATION.

(a) POWER GRID DIGITAL INFORMATION TECHNOLOGY.—The Secretary, in consultation with the Federal Energy Regulatory Commission and other appropriate agencies, electric utilities, the States, and other stakeholders, shall carry out a research, development, and demonstration program—

(1) to develop advanced techniques for measuring peak load reductions and energy-efficiency savings from smart metering, demand response, distributed generation, and electricity storage systems;

(2) to investigate means for demand response, distributed generation, and storage to provide ancillary services;

(3) to conduct research to advance the use of wide-area measurement and control networks, including data mining, visualization, advanced computing, and secure and dependable communications in a highly-distributed environment;

(4) to test new reliability technologies, including those concerning communications network capabilities, in a grid control room environment against a representative set of local outage and wide area blackout scenarios;

(5) to identify communications network capacity needed to implement advanced technologies.

(6) to investigate the feasibility of a transition to time-of-use and real-time electricity pricing;

(7) to develop algorithms for use in electric transmission system software applications;

(8) to promote the use of underutilized electricity generation capacity in any substitution of electricity for liquid fuels in the transportation system of the United States; and

(9) in consultation with the Federal Energy Regulatory Commission, to propose interconnection protocols to enable electric utilities to access electricity stored in vehicles to help meet peak demand loads.

(b) SMART GRID REGIONAL DEMONSTRATION INITIATIVE.—

(1) IN GENERAL.—The Secretary shall establish a smart grid regional demonstration initiative (referred to in this subsection as the “Initiative”) composed of demonstration projects focused on cost-effective, advanced technologies for use in power grid sensing, communications, analysis, power flow control, visualization, distribution automation, industrial control systems, dynamic line rating systems, grid redesign, and the integration of distributed energy resources.

(2) GOALS.—The goals of the Initiative shall be—

(A) to demonstrate the potential benefits of concentrated investments in advanced grid technologies on a regional grid;

(B) to facilitate the commercial transition from the current power transmission and distribution system technologies to advanced technologies;

(C) to facilitate the integration of advanced technologies in existing electric networks to improve system performance, power flow control, and reliability;

(D) to demonstrate protocols and standards that allow for the measurement and validation of the energy savings and fossil fuel emission reductions associated with the installation and use of energy efficiency and demand response technologies and practices;

(E) to investigate differences in each region and regulatory environment regarding best practices in implementing smart grid technologies; and

(F) to encourage the commercial application of advanced distribution automation technologies that exert intelligent control over electrical grid functions at the distribution level to improve system resilience.

(3) DEMONSTRATION PROJECTS.—

(A) IN GENERAL.—In carrying out the initiative, the Secretary shall provide financial support to smart grid demonstration projects in urban, suburban, tribal, and rural areas, including areas where electric system assets are controlled by nonprofit entities and areas where elec-

tric system assets are controlled by investor-owned utilities.

(B) COOPERATION.—A demonstration project under subparagraph (A) shall be carried out in cooperation with the electric utility that owns the grid facilities in the electricity control area in which the demonstration project is carried out.

(C) FEDERAL SHARE OF COST OF TECHNOLOGY INVESTMENTS.—The Secretary shall provide to an electric utility described in subparagraph (B) or to other parties financial assistance for use in paying an amount equal to not more than 50 percent of the cost of qualifying advanced grid technology investments made by the electric utility or other party to carry out a demonstration project.

(D) INELIGIBILITY FOR GRANTS.—No person or entity participating in any demonstration project conducted under this subsection shall be eligible for grants under section 1306 for otherwise qualifying investments made as part of that demonstration project.

(E) AVAILABILITY OF DATA.—The Secretary shall establish and maintain a smart grid information clearinghouse in a timely manner which will make data from smart grid demonstration projects and other sources available to the public. As a condition of receiving financial assistance under this subsection, a utility or other participant in a smart grid demonstration project shall provide such information as the Secretary may require to become available through the smart grid information clearinghouse in the form and within the timeframes as directed by the Secretary. The Secretary shall assure that business proprietary information and individual customer information is not included in the information made available through the clearinghouse.

(F) OPEN PROTOCOLS AND STANDARDS.—The Secretary shall require as a condition of receiving funding under this subsection that demonstration projects utilize open protocols and standards (including Internet-based protocols and standards) if available and appropriate.

(c) AUTHORIZATION OF APPROPRIATIONS.—There are authorized to be appropriated—

(1) to carry out subsection (a), such sums as are necessary for each of fiscal years 2008 through 2012; and

(2) to carry out subsection (b), such sums as may be necessary.

SEC. 1304A. [42 U.S.C. 17384a] SMART GRID MODELING, VISUALIZATION, ARCHITECTURE, AND CONTROLS.

(a) IN GENERAL.—Not later than 180 days after the enactment of this section, the Secretary shall establish a program of research, development, demonstration, and commercial application on electric grid modeling, sensing, visualization, architecture development, and advanced operation and controls.

(b) MODELING RESEARCH AND DEVELOPMENT.—The Secretary shall support development of models of emerging technologies and systems to facilitate the secure and reliable design, planning, and

operation of the electric grid for use by industry stakeholders. In particular, the Secretary shall support development of—

- (1) models to analyze and predict the effects of adverse physical and cyber events on the electric grid;
- (2) coupled models of electrical, physical, and cyber systems;
- (3) models of existing and emerging technologies being deployed on the electric grid due to projected changes in the electric generation mix and loads, for a variety of regional characteristics; and
- (4) integrated models of the communications, transmission, distribution, and other interdependent systems for existing, new, and emerging technologies.

(c) SITUATIONAL AWARENESS RESEARCH AND DEVELOPMENT.—

(1) IN GENERAL.—The Secretary shall support development of computational tools and technologies to improve sensing, monitoring, and visualization of the electric grid for real-time situational awareness and decision support tools that enable improved operation of the power system, including utility, non-utility, and customer grid-connected assets, for use by industry partners.

(2) DATA USE.—In developing visualization capabilities under this section, the Secretary shall develop tools for industry stakeholders to use to analyze data collected from advanced measurement and monitoring technologies, including data from phasor measurement units and advanced metering units.

(3) SEVERE EVENTS.—The Secretary shall prioritize enhancing cyber and physical situational awareness of the electric grid during adverse manmade and naturally-occurring events.

(d) OPERATION AND CONTROLS RESEARCH AND DEVELOPMENT.—

The Secretary shall conduct research to develop improvements to the operation and controls of the electric grid, in coordination with industry partners. Such activities shall include—

- (1) a training facility or facilities to allow grid operators to gain operational experience with advanced grid control concepts and technologies;
- (2) development of cost-effective advanced operation and control concepts and technologies, such as adaptive islanding, dynamic line rating systems, power flow controllers, network topology optimization, smart circuit breakers, intelligent load shedding, and fault-tolerant control system architectures;
- (3) development of real-time control concepts using artificial intelligence and machine learning for improved electric grid resilience; and
- (4) utilization of advanced data analytics including load forecasting, power flow modeling, equipment failure prediction, resource optimization, risk analysis, and decision analysis.

(e) INTEROPERABILITY RESEARCH AND DEVELOPMENT.—The Secretary shall conduct research and development on tools and technologies that improve the interoperability and compatibility of new and emerging components, technologies, and systems with existing electric grid infrastructure.

(f) UNDERGROUND TRANSMISSION AND DISTRIBUTION LINES.—In carrying out the program under subsection (a), the Secretary shall support research and development on underground transmission and distribution lines. This shall include research on—

(1) methods for lowering the costs of underground transmission and distribution lines, including through novel installation techniques and materials considerations;

(2) techniques to improve the lifespan of underground transmission and distribution lines;

(3) wireless sensors to improve safety of underground transmission and distribution lines and to predict, identify, detect, and transmit information about degradation and faults; and

(4) methods for improving the resilience and reliability of underground transmission and distribution lines, including technologies and techniques that can mitigate the impact of flooding, storm surge, and seasonal climate cycles on degradation of and damage to underground transmission and distribution lines.

(g) GRID ARCHITECTURE AND SCENARIO DEVELOPMENT.—

(1) IN GENERAL.—Subject to paragraph (3), the Secretary shall establish and facilitate a collaborative process to develop model grid architecture and a set of future scenarios for the electric grid to examine the impacts of different combinations of resources (including different quantities of distributed energy resources and large-scale, central generation) on the electric grid.

(2) ARCHITECTURE.—In supporting the development of model grid architectures, the Secretary shall—

(A) analyze a variety of grid architecture scenarios that range from minor upgrades to existing transmission grid infrastructure to scenarios that involve the replacement of significant portions of existing transmission grid infrastructure;

(B) analyze the effects of the increasing proliferation of renewable and other zero emissions energy generation sources, increasing use of distributed resources owned by non-utility entities, and the use of digital and automated controls not managed by grid operators;

(C) include a variety of new and emerging distribution grid technologies, including distributed energy resources, electric vehicle charging stations, distribution automation technologies, energy storage, and renewable energy sources;

(D) analyze the effects of local load balancing and other forms of decentralized control;

(E) analyze the effects of changes to grid architectures resulting from modernizing electric grid systems, including communications, controls, markets, consumer choice, emergency response, electrification, and cybersecurity concerns; and

(F) develop integrated grid architectures that incorporate system resilience for cyber, physical, and communications systems.

(3) **MARKET STRUCTURE.**—The grid architecture and scenarios developed under paragraph (1) shall, to the extent practicable, account for differences in market structure, including an examination of the potential for stranded costs in each type of market structure.

(h) **COMPUTING RESOURCES AND DATA COORDINATION RESEARCH AND DEVELOPMENT.**—In carrying out this section, the Secretary shall—

(1) leverage existing computing resources at the National Laboratories; and

(2) develop voluntary standards for data taxonomies and communication protocols in coordination with public and private sector stakeholders.

(i) **INFORMATION SHARING.**—None of the activities authorized in this section shall require private entities to share information or data with the Secretary.

(j) **RESILIENCE.**—In this section, the term “resilience” means the ability to withstand and reduce the magnitude or duration of disruptive events, which includes the capability to anticipate, absorb, adapt to, or rapidly recover from such an event, including from deliberate attacks, accidents, and naturally occurring threats or incidents.

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SEC. 1306. [42 U.S.C. 17386] FEDERAL MATCHING FUND FOR SMART GRID INVESTMENT COSTS.

(a) **MATCHING FUND.**—The Secretary shall establish a Smart Grid Investment Matching Grant Program to provide grants of up to one-half (50 percent) of qualifying Smart Grid investments.

(b) **QUALIFYING INVESTMENTS.**—Qualifying Smart Grid investments may include any of the following made on or after the date of enactment of the Infrastructure Investment and Jobs Act:

(1) In the case of appliances covered for purposes of establishing energy conservation standards under part B of title III of the Energy Policy and Conservation Act of 1975 (42 U.S.C. 6291 et seq.), the documented expenditures incurred by a manufacturer of such appliances associated with purchasing or designing, creating the ability to manufacture, and manufacturing and installing for one calendar year, internal devices that allow the appliance to engage in Smart Grid functions.

(2) In the case of specialized electricity-using equipment, including motors and drivers, installed in industrial or commercial applications, the documented expenditures incurred by its owner or its manufacturer of installing devices or modifying that equipment to engage in Smart Grid functions.

(3) In the case of transmission and distribution equipment fitted with monitoring and communications devices to enable smart grid functions, the documented expenditures incurred by the electric utility to purchase and install such monitoring and communications devices.

(4) In the case of metering devices, sensors, control devices, and other devices integrated with and attached to an electric utility system or retail distributor or marketer of electricity that are capable of engaging in Smart Grid functions,

the documented expenditures incurred by the electric utility, distributor, or marketer and its customers to purchase and install such devices.

(5) In the case of software that enables devices or computers to engage in Smart Grid functions, the documented purchase costs of the software.

(6) In the case of entities that operate or coordinate operations of regional electric grids, the documented expenditures for purchasing and installing such equipment that allows Smart Grid functions to operate and be combined or coordinated among multiple electric utilities and between that region and other regions.

(7) In the case of persons or entities other than electric utilities owning and operating a distributed electricity generator, the documented expenditures of enabling that generator to be monitored, controlled, or otherwise integrated into grid operations and electricity flows on the grid utilizing Smart Grid functions.

(8) In the case of electric or hybrid-electric vehicles, the documented expenses for devices that allow the vehicle to engage in Smart Grid functions (but not the costs of electricity storage for the vehicle).

(9) In the case of data analytics that enable software to engage in Smart Grid functions, the documented purchase costs of the data analytics.

(10) In the case of buildings, the documented expenses for devices and software, including for installation, that allow buildings to engage in demand flexibility or Smart Grid functions.

(11) In the case of utility communications, operational fiber and wireless broadband communications networks to enable data flow between distribution system components.

(12) In the case of advanced transmission technologies such as dynamic line rating, flow control devices, advanced conductors, network topology optimization, or other hardware, software, and associated protocols applied to existing transmission facilities that increase the operational transfer capacity of a transmission network, the documented expenditures to purchase and install those advanced transmission technologies.

(13) In the case of extreme weather or natural disasters, the ability to redirect or shut off power to minimize blackouts and avoid further damage.

(14) The documented expenditures related to purchasing and implementing Smart Grid functions in such other cases as the Secretary shall identify.

(c) INVESTMENTS NOT INCLUDED.—Qualifying Smart Grid investments do not include any of the following:

(1) Investments or expenditures for Smart Grid technologies, devices, or equipment that utilize specific tax credits or deductions under the Internal Revenue Code, as amended.

(2) Expenditures for electricity generation, transmission, or distribution infrastructure or equipment not directly related to enabling Smart Grid functions.

(3) After the final date for State consideration of the Smart Grid Information Standard under section 1307 (paragraph (17) of section 111(d) of the Public Utility Regulatory Policies Act of 1978), an investment that is not in compliance with such standard.

(4) After the development and publication by the Institute of protocols and model standards for interoperability of smart grid devices and technologies, an investment that fails to incorporate any of such protocols or model standards.

(5) Expenditures for physical interconnection of generators or other devices to the grid except those that are directly related to enabling Smart Grid functions.

(6) Expenditures for ongoing salaries, benefits, or personnel costs not incurred in the initial installation, training, or start up of smart grid functions.

(7) Expenditures for travel, lodging, meals or other personal costs.

(8) Ongoing or routine operation, billing, customer relations, security, and maintenance expenditures.

(9) Such other expenditures that the Secretary determines not to be Qualifying Smart Grid Investments by reason of the lack of the ability to perform Smart Grid functions or lack of direct relationship to Smart Grid functions.

(d) SMART GRID FUNCTIONS.—The term “smart grid functions” means any of the following:

(1) The ability to develop, store, send and receive digital information concerning electricity use, costs, prices, time of use, nature of use, storage, or other information relevant to device, grid, or utility operations, to or from or by means of the electric utility system, through one or a combination of devices and technologies.

(2) The ability to develop, store, send and receive digital information concerning electricity use, costs, prices, time of use, nature of use, storage, or other information relevant to device, grid, or utility operations to or from a computer or other control device.

(3) The ability to measure or monitor electricity use as a function of time of day, power quality characteristics such as voltage level, current, cycles per second, or source or type of generation and to store, synthesize or report that information by digital means.

(4) The ability to sense and localize disruptions or changes in power flows on the grid and communicate such information instantaneously and automatically for purposes of enabling automatic protective responses to sustain reliability and security of grid operations.

(5) The ability to detect, prevent, communicate with regard to, respond to, or recover from system security threats, including cyber-security threats and terrorism, using digital information, media, and devices.

(6) The ability of any appliance or machine to respond to such signals, measurements, or communications automatically or in a manner programmed by its owner or operator without independent human intervention.

(7) The ability to use digital information to operate functionalities on the electric utility grid that were previously electro-mechanical or manual.

(8) The ability to use digital controls to manage and modify electricity demand, enable congestion management, assist in voltage control, provide operating reserves, and provide frequency regulation.

(9) The ability to use data analytics and software-as-a-service to provide flexibility by improving the visibility of the electrical system to grid operators that can help quickly rebalance the electrical system with autonomous controls.

(10) The ability to facilitate the aggregation or integration of distributed energy resources to serve as assets for the grid.

(11) The ability to provide energy storage to meet fluctuating electricity demand, provide voltage support, and integrate intermittent generation sources, including vehicle-to-grid technologies.

(12) The ability of hardware, software, and associated protocols applied to existing transmission facilities to increase the operational transfer capacity of a transmission network.

(13) The ability to anticipate and mitigate impacts of extreme weather or natural disasters on grid resiliency.

(14) The ability to facilitate the integration of renewable energy resources, electric vehicle charging infrastructure, and vehicle-to-grid technologies.

(15) The ability to reliably meet increased demand from electric vehicles and the electrification of appliances and other sectors.

(16) Such other functions as the Secretary may identify as being necessary or useful to the operation of a Smart Grid.

(e) PROCEDURES AND RULES.—(1) The Secretary shall, within 60 days after the enactment of the American Recovery and Reinvestment Act of 2009, by means of a notice of intent and subsequent solicitation of grant proposals—

(A) establish procedures by which applicants can obtain grants of not more than one-half of their documented costs;

(B) require as a condition of receiving funding under this subsection that demonstration projects utilize open protocols and standards (including Internet-based protocols and standards) if available and appropriate;

(C) establish procedures to ensure that there is no duplication or multiple payment for the same investment or costs, that the grant goes to the party making the actual expenditures for the qualifying Smart Grid investments, and that the grants made have a significant effect in encouraging and facilitating the development of a smart grid;

(D) establish procedures to ensure there will be public records of grants made, recipients, and qualifying Smart Grid investments which have received grants; and

(E) establish procedures to provide advance payment of moneys up to the full amount of the grant award.

(2) The Secretary shall have discretion and exercise reasonable judgment to deny grants for investments that do not qualify.

(f) AUTHORIZATION OF APPROPRIATIONS.—There are authorized to be appropriated to the Secretary such sums as are necessary for the administration of this section and the grants to be made pursuant to this section for fiscal years 2008 through 2012.

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SEC. 1310. [42 U.S.C. 17387] INTEGRATED ENERGY SYSTEMS.

(a) IN GENERAL.—Not later than 180 days after the enactment of this section, the Secretary shall establish a research, development, and demonstration program to develop cost-effective integrated energy systems, including—

(1) development of computer modeling to design different configurations of integrated energy systems and to optimize system operation;

(2) research on system integration needed to plan, design, build, and operate integrated energy systems, including interconnection requirements with the electric grid;

(3) development of integrated energy systems for various applications, including—

(A) thermal energy generation and storage for buildings and manufacturing;

(B) electricity storage coupled with energy generation;

(C) desalination;

(D) production of liquid and gaseous fuels; and

(E) production of chemicals such as ammonia and ethylene;

(4) development of testing facilities for integrated energy systems; and

(5) research on incorporation of various technologies for integrated energy systems, including nuclear energy, renewable energy, storage, and carbon capture, utilization, and sequestration technologies.

(b) STRATEGIC PLAN.—

(1) IN GENERAL.—Not later than 1 year after the date of the enactment of this section, the Secretary 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 strategic plan that identifies opportunities, challenges, and standards needed for the development and commercial application of integrated energy systems. The strategic plan shall include—

(A) analysis of the potential benefits of development of integrated electric systems on the electric grid;

(B) analysis of the potential contributions of integrated energy systems to different grid architecture scenarios;

(C) research and development goals for various integrated energy systems, including those identified in subsection (a);

(D) assessment of policy and market barriers to the adoption of integrated energy systems;

(E) analysis of the technical and economic feasibility of adoption of different integrated energy systems; and

(F) a 10-year roadmap to guide the program established under subsection (a).

(2) **UPDATES.**—Not less than once every 3 years for the duration of this research program, the Secretary shall submit an updated version of the strategic plan to the Committee on Science, Space, and Technology of the House of Representatives and the Committee on Energy and Natural Resources of the Senate.

(c) **PROGRAM IMPLEMENTATION.**—In carrying out the research, development, demonstration, and commercial application aims of subsection (a), the Secretary shall—

(1) implement the recommendations set forth in the strategic plan in subsection (b);

(2) coordinate across all relevant program offices at the Department, including—

(A) the Office of Energy Efficiency and Renewable Energy;

(B) the Office of Nuclear Energy; and

(C) the Office of Fossil Energy;

(3) leverage existing programs and resources of the Department; and

(4) prioritize activities that accelerate the development of integrated electricity generation, storage, and distribution systems with net zero greenhouse gas emissions.

(d) **INTEGRATED ENERGY SYSTEM DEFINED.**—The term “integrated energy system” means a system composed of 2 or more colocated or jointly operated sub-systems of energy generation, energy storage, or other energy technologies.

SEC. 1311. [42 U.S.C. 17388] ADVISORY COMMITTEE.

(a) **IN GENERAL.**—Not later than 180 days after the enactment of this section, the Secretary shall designate an existing advisory committee to advise the Secretary on the authorization of research, development, and demonstration projects under sections 1304 and 1304A.

(b) **RESPONSIBILITY.**—The Secretary shall annually solicit from the advisory committee—

(1) comments to identify grid modernization technology needs;

(2) an assessment of the progress of the research activities on grid modernization; and

(3) assistance in annually updating grid modernization technology roadmaps.

TITLE XIV—POOL AND SPA SAFETY

SEC. 1401. [15 U.S.C. 8001 note] SHORT TITLE.

This title may be cited as the “Virginia Graeme Baker Pool and Spa Safety Act”.

SEC. 1402. [15 U.S.C. 8001] FINDINGS.

Congress finds the following:

(1) Of injury-related deaths, drowning is the second leading cause of death in children aged 1 to 14 in the United States.

(2) In 2004, 761 children aged 14 and under died as a result of unintentional drowning.

(3) Adult supervision at all aquatic venues is a critical safety factor in preventing children from drowning.

(4) Research studies show that the installation and proper use of barriers or fencing, as well as additional layers of protection, could substantially reduce the number of childhood residential swimming pool drownings and near drownings.

SEC. 1403. [15 U.S.C. 8002] DEFINITIONS.

In this title:

(1) **ASME/ANSI.**—The term “ASME/ANSI” as applied to a safety standard means such a standard that is accredited by the American National Standards Institute and published by the American Society of Mechanical Engineers.

(2) **BARRIER.**—The term “barrier” includes a natural or constructed topographical feature that prevents unpermitted access by children to a swimming pool, and, with respect to a hot tub, a lockable cover.

(3) **COMMISSION.**—The term “Commission” means the Consumer Product Safety Commission.

(4) **COVERED ENTITY.**—The term “covered entity” means—
 (A) a State; or
 (B) an Indian Tribe.

(5) **INDIAN TRIBE.**—The term “Indian Tribe” has the meaning given that term in section 4(e) of the Indian Self-Determination and Education Assistance Act (25 U.S.C. 5304(e)).

(6) **MAIN DRAIN.**—The term “main drain” means a submerged suction outlet typically located at the bottom of a pool or spa to conduct water to a recirculating pump.

(7) **SAFETY VACUUM RELEASE SYSTEM.**—The term “safety vacuum release system” means a vacuum release system capable of providing vacuum release at a suction outlet caused by a high vacuum occurrence due to a suction outlet flow blockage.

(8) **SWIMMING POOL; SPA.**—The term “swimming pool” or “spa” means any outdoor or indoor structure intended for swimming or recreational bathing, including in-ground and above-ground structures, and includes hot tubs, spas, portable spas, and non-portable wading pools.

(9) **UNBLOCKABLE DRAIN.**—The term “unblockable drain” means a drain of any size and shape that a human body cannot sufficiently block to create a suction entrapment hazard.

(10) **STATE.**—The term “State” has the meaning given such term in section 3(a) of the Consumer Product Safety Act (15 U.S.C. 2052(a)), and includes the Northern Mariana Islands. For purposes of eligibility for the grants authorized under section 1405, such term shall also include any political subdivision of a State.

SEC. 1404. [15 U.S.C. 8003] FEDERAL SWIMMING POOL AND SPA DRAIN COVER STANDARD.

(a) **CONSUMER PRODUCT SAFETY RULE.**—The requirements described in subsection (b) shall be treated as a consumer product

safety rule issued by the Consumer Product Safety Commission under the Consumer Product Safety Act (15 U.S.C. 2051 et seq.).

(b) DRAIN COVER STANDARD.—Effective 1 year after the date of enactment of this title, each swimming pool or spa drain cover manufactured, distributed, or entered into commerce in the United States shall conform to the entrapment protection standards of the ASME/ANSI A112.19.8 performance standard, or any successor standard regulating such swimming pool or drain cover. If a successor standard is proposed, the American Society of Mechanical Engineers shall notify the Commission of the proposed revision. If the Commission determines that the proposed revision is in the public interest, it shall incorporate the revision into the standard after providing 30 days notice to the public.

(c) PUBLIC POOLS.—

(1) REQUIRED EQUIPMENT.—

(A) IN GENERAL.—Beginning 1 year after the date of enactment of this title—

(i) each public pool and spa in the United States shall be equipped with anti-entrapment devices or systems that comply with the ASME/ANSI A112.19.8 performance standard, or any successor standard; and

(ii) each public pool and spa in the United States with a single main drain other than an unblockable drain shall be equipped, at a minimum, with 1 or more of the following devices or systems designed to prevent entrapment by pool or spa drains that meets the requirements of subparagraph (B):

(I) SAFETY VACUUM RELEASE SYSTEM.—A safety vacuum release system which ceases operation of the pump, reverses the circulation flow, or otherwise provides a vacuum release at a suction outlet when a blockage is detected, that has been tested by an independent third party and found to conform to ASME/ANSI standard A112.19.17 or ASTM standard F2387.

(II) SUCTION-LIMITING VENT SYSTEM.—A suction-limiting vent system with a tamper-resistant atmospheric opening.

(III) GRAVITY DRAINAGE SYSTEM.—A gravity drainage system that utilizes a collector tank.

(IV) AUTOMATIC PUMP SHUT-OFF SYSTEM.—An automatic pump shut-off system.

(V) DRAIN DISABLEMENT.—A device or system that disables the drain.

(VI) OTHER SYSTEMS.—Any other system determined by the Commission to be equally effective as, or better than, the systems described in subclauses (I) through (V) of this clause at preventing or eliminating the risk of injury or death associated with pool drainage systems.

(B) APPLICABLE STANDARDS.—Any device or system described in subparagraph (A)(ii) shall meet the requirements of any ASME/ANSI or ASTM performance standard

if there is such a standard for such a device or system, or any applicable consumer product safety standard.

(2) PUBLIC POOL AND SPA DEFINED.—In this subsection, the term “public pool and spa” means a swimming pool or spa that is—

(A) open to the public generally, whether for a fee or free of charge;

(B) open exclusively to—

(i) members of an organization and their guests;

(ii) residents of a multi-unit apartment building, apartment complex, residential real estate development, or other multi-family residential area (other than a municipality, township, or other local government jurisdiction); or

(iii) patrons of a hotel or other public accommodations facility; or

(C) operated by the Federal Government (or by a concessionaire on behalf of the Federal Government) for the benefit of members of the Armed Forces and their dependents or employees of any department or agency and their dependents.

(3) ENFORCEMENT.—Violation of paragraph (1) shall be considered to be a violation of section 19(a)(1) of the Consumer Product Safety Act (15 U.S.C. 2068(a)(1)) and may also be enforced under section 17 of that Act (15 U.S.C. 2066).

SEC. 1405. [15 U.S.C. 8004] SWIMMING POOL SAFETY GRANT PROGRAM.

(a) IN GENERAL.—Subject to the availability of appropriations authorized by subsection (e), the Commission shall carry out a grant program to provide assistance to eligible covered entities.

(b) ELIGIBILITY.—To be eligible for a grant under the program, a covered entity shall—

(1) demonstrate to the satisfaction of the Commission that, as of the date on which the covered entity submits an application to the Commission for a grant under this section, the covered entity has enacted and provides for the enforcement of a statute that—

(A) except as provided in section 1406(a)(1)(A)(i), applies to all swimming pools constructed in the State or in the jurisdiction of the Indian Tribe (as the case may be) on or after such date; and

(B) meets the minimum State law requirements of section 1406; and

(2) submit an application to the Commission at such time, in such form, and containing such additional information as the Commission may require.

(c) AMOUNT OF GRANT.—The Commission shall determine the amount of a grant awarded under this section, and shall consider—

(1) the population of the covered entity;

(2) the relative enforcement and implementation needs of the covered entity; and

(3) allocation of grant funds in a manner designed to provide the maximum benefit from the program in terms of protecting children from drowning or entrapment.

(d) USE OF GRANT FUNDS.—A State or an Indian Tribe receiving a grant under this section shall use—

(1) at least 25 percent of amounts made available—

(A) to hire and train personnel for implementation and enforcement of standards under the swimming pool and spa safety law of the State or Indian Tribe; and

(B) to defray administrative costs associated with the hiring and training programs under subparagraph (A); and

(2) the remainder—

(A) to educate pool owners, pool operators, and other members of the public about the standards under the swimming pool and spa safety law of the State or Indian Tribe and about the prevention of drowning or entrapment of children using swimming pools and spas; and

(B) to defray administrative costs associated with the education programs under subparagraph (A).

(e) AUTHORIZATION OF APPROPRIATIONS.—There are authorized to be appropriated to the Commission for fiscal year 2023 \$2,500,000 to carry out this section.

SEC. 1406. [15 U.S.C. 8005] MINIMUM STATE LAW REQUIREMENTS.

(a) IN GENERAL.—

(1) SAFETY STANDARDS.—A State meets the minimum State law requirements of this section if—

(A) the State requires by statute—

(i) the enclosure of all outdoor residential pools and spas by barriers to entry that will effectively prevent small children from gaining unsupervised and unfettered access to the pool or spa; and

(ii) that pools and spas built more than 1 year after the date of the enactment of such statute have—

(I) more than 1 drain;

(II) 1 or more unblockable drains; or

(III) no main drain; and

(B) the State meets such additional State law requirements for pools and spas as the Commission may establish after public notice and a 30-day public comment period.

(2) USE OF MINIMUM STATE LAW REQUIREMENTS.—The Commission—

(A) shall use the minimum State law requirements under paragraph (1) solely for the purpose of determining the eligibility of a covered entity for a grant under section 1405 of this Act; and

(B) may not enforce any requirement under paragraph (1) except for the purpose of determining the eligibility of a covered entity for a grant under section 1405 of this Act.

(3) REQUIREMENTS TO REFLECT NATIONAL PERFORMANCE STANDARDS AND COMMISSION GUIDELINES.—In establishing minimum State law requirements under paragraph (1)(B), the Commission shall—

(A) consider current or revised national performance standards on pool and spa barrier protection and entrapment prevention; and

(B) ensure that any such requirements are consistent with the guidelines contained in the Commission's publication 362, entitled "Safety Barrier Guidelines for Home Pools", the Commission's publication entitled "Guidelines for Entrapment Hazards: Making Pools and Spas Safer", and any other pool safety guidelines established by the Commission.

(b) STANDARDS.—Nothing in this section prevents the Commission from promulgating standards regulating pool and spa safety or from relying on an applicable national performance standard.

(c) BASIC ACCESS-RELATED SAFETY DEVICES AND EQUIPMENT REQUIREMENTS TO BE CONSIDERED.—In establishing minimum State law requirements for swimming pools and spas under subsection (a)(1), the Commission shall consider the following requirements:

(1) COVERS.—A safety pool cover.

(2) GATES.—A gate with direct access to the swimming pool or spa that is equipped with a self-closing, self-latching device.

(3) DOORS.—Any door with direct access to the swimming pool or spa that is equipped with an audible alert device or alarm which sounds when the door is opened.

(4) POOL ALARM.—A device designed to provide rapid detection of an entry into the water of a swimming pool or spa.

(d) ENTRAPMENT, ENTANGLEMENT, AND EVISCERATION PREVENTION STANDARDS TO BE REQUIRED.—

(1) IN GENERAL.—In establishing additional minimum State law requirements for swimming pools and spas under subsection (a)(1), the Commission shall require, at a minimum, 1 or more of the following (except for pools constructed without a single main drain):

(A) SAFETY VACUUM RELEASE SYSTEM.—A safety vacuum release system which ceases operation of the pump, reverses the circulation flow, or otherwise provides a vacuum release at a suction outlet when a blockage is detected, that has been tested by an independent third party and found to conform to ASME/ANSI standard A112.19.17 or ASTM standard F2387, or any successor standard.

(B) SUCTION-LIMITING VENT SYSTEM.—A suction-limiting vent system with a tamper-resistant atmospheric opening.

(C) GRAVITY DRAINAGE SYSTEM.—A gravity drainage system that utilizes a collector tank.

(D) AUTOMATIC PUMP SHUT-OFF SYSTEM.—An automatic pump shut-off system.

(E) DRAIN DISABLEMENT.—A device or system that disables the drain.

(F) OTHER SYSTEMS.—Any other system determined by the Commission to be equally effective as, or better than, the systems described in subparagraphs (A) through (E) of this paragraph at preventing or eliminating the risk of injury or death associated with pool drainage systems.

(2) APPLICABLE STANDARDS.—Any device or system described in subparagraphs (B) through (E) of paragraph (1) shall

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meet the requirements of any ASME/ANSI or ASTM performance standard if there is such a standard for such a device or system, or any applicable consumer product safety standard.

(e) STATE DEFINED.—In this section, the term “State” includes an Indian Tribe.

SEC. 1407. [15 U.S.C. 8006] EDUCATION AND AWARENESS PROGRAM.

(a) IN GENERAL.—The Commission shall establish and carry out an education and awareness program to inform the public of methods to prevent drowning and entrapment in swimming pools and spas. In carrying out the program, the Commission shall develop—

(1) educational materials designed for swimming pool and spa manufacturers, service companies, and supply retail outlets, including guidance on barrier and drain cover inspection, maintenance, and replacement;

(2) educational materials designed for swimming pool and spa owners and operators, consumers, States, and Indian Tribes; and

(3) a national media campaign to promote awareness of swimming pool and spa safety.

(b) AUTHORIZATION OF APPROPRIATIONS.—There are authorized to be appropriated to the Commission for fiscal year 2023 \$2,500,000 to carry out the education and awareness program authorized by subsection (a).

SEC. 1408. [15 U.S.C. 8007] CPSC REPORT.

Not later than 1 year after the last day of each fiscal year for which grants are made under section 1405, the Commission shall submit to Congress a report evaluating the implementation of the grant program authorized by that section.

SEC. 1409. [15 U.S.C. 8008] APPLICABILITY.

This Act⁸ is applicable to the United States and its territories, including American Samoa, the Commonwealth of Puerto Rico, Guam, the Commonwealth of the Northern Mariana Islands, and the United States Virgin Islands.

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⁸The reference to “This Act” in section 1409 probably should be to “This title”.