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(Original Signature of Member)

115TH CONGRESS
2D SESSION

H. R. _____

To amend the Energy Policy Act of 2005 to direct Federal research in fossil energy and to promote the development and demonstration of environmentally responsible coal and natural gas technologies, and for other purposes.

IN THE HOUSE OF REPRESENTATIVES

Mr. VEASEY (for himself, Mr. MCKINLEY, and Ms. EDDIE BERNICE JOHNSON of Texas) introduced the following bill; which was referred to the Committee on _____

A BILL

To amend the Energy Policy Act of 2005 to direct Federal research in fossil energy and to promote the development and demonstration of environmentally responsible coal and natural gas technologies, 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 ''Fossil Energy Research and Development Act of 2018''.

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

SEC. 2. DEFINITIONS.

For purposes of this Act:

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

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

SEC. 3. REPEAL OF CLEAN COAL POWER INITIATIVE.

(a) REPEAL.—Subtitle A of title IV of the Energy Policy Act of 2005 (42 U.S.C. 15801 note) is repealed.

(b) TECHNICAL AMENDMENT.—The table of contents for the Energy Policy Act of 2005 (42 U.S.C. 15801 note) is amended by striking the items related to subtitle A of title IV.

SEC. 4. FOSSIL ENERGY OBJECTIVES.

Section 961 of the Energy Policy Act of 2005 (42 U.S.C. 16291) is amended—

(1) in subsection (a), by adding at the end the following:

''(8) Improving the conversion, use, and storage of carbon dioxide produced from fossil fuels.

''(9) Lowering greenhouse gas emissions for all fossil fuel production, generation, delivery, and utilization, to the maximum extent possible.

''(10) Preventing, predicting, monitoring, and mitigating the unintended leaking of methane, carbon dioxide, or other fossil fuel-related emissions into the atmosphere.

''(11) Reducing water use, improving water reuse, and minimizing the surface and subsurface environmental impact in the development of unconventional domestic oil and natural gas resources.

''(12) Developing carbon utilization technologies, products, and methods, including carbon use and reuse for commercial application.'';

(2) in subsection (b), by striking paragraphs (1) through (3) and inserting the following:

''(1) $825,000,000 for fiscal year 2019;

''(2) $866,250,000 for fiscal year 2020;

''(3) $909,563,000 for fiscal year 2021;

''(4) $955,041,000 for fiscal year 2022; and

''(5) $1,002,793,000 for fiscal year 2023.''; and

(3) by striking subsections (c) through (e) and inserting the following:

''(c) LIMITATION.—None of the funds authorized under this section may be used for Fossil Energy Environmental Restoration or Import/Export Authorization.''.

SEC. 5. CARBON CAPTURE TECHNOLOGIES FOR POWER SYSTEMS.

(a) CARBON CAPTURE PROGRAM.—Section 962 of the Energy Policy Act of 2005 (42 U.S.C. 16292) is amended to read as follows:

''SEC. 962. CARBON CAPTURE TECHNOLOGIES FOR POWER SYSTEMS.

''(a) IN GENERAL.—The Secretary shall conduct a program of research, development, demonstration, and commercial application of carbon capture technologies, including to facilitate the development and use of—

''(1) carbon capture technologies for coal and natural gas;

''(2) innovations to improve the efficiency of, and decrease emissions at, existing power plants; and

''(3) advanced separation technologies.

''(b) PRIORITIZATION.—The Secretary shall maintain robust investments in carbon capture technologies for coal applications.

''(c) LARGE-SCALE PILOTS.—In supporting technology development activities under this section, the Secretary is encouraged to support pilot projects that test carbon capture technologies on powers systems below the 100 megawatt scale, consistent with section 988(b).

''(d) COST AND PERFORMANCE GOALS.—In carrying out the development, demonstration, and commercial application activities under subsection (a), the Secretary shall consider cost and performance goals to assist in the transfer of carbon capture research to commercially viable technologies.

''(e) CARBON CAPTURE PILOT TEST CENTERS.—

''(1) IN GENERAL.—Not later than 1 year after the date of the enactment of the Fossil Energy Research and Development Act of 2018, the Secretary shall award grants to 1 or more eligible entities for the operation of not less than 3 Carbon Capture Test Centers (in this subsection, known as the 'Centers') to provide unique testing capabilities for innovative carbon capture technologies for power systems.

''(2) PURPOSE.—The Centers shall—

''(A) advance research, development, demonstration, and commercial application of car-

bon capture technologies for power systems; and

''(B) test technologies that represent the scale of technology development beyond laboratory testing, but not yet advanced to testing under operational conditions at commercial scale.

''(3) APPLICATION.—An entity seeking to operate a Center under this subsection shall submit to the Secretary an application at such time and in such manner as the Secretary may require.

''(4) CRITERIA.—In selecting applications to operate the Centers under this subsection, the Secretary shall prioritize applicants that meet 1 or more of the following criteria:

''(A) Applicants with access to existing or planned research facilities with modular technology capabilities.

''(B) Institutions of higher education with established expertise in engineering and design for carbon capture technologies, or partnerships with such institutions.

''(C) Applicants with access to existing research and test facilities for pre-combustion,

post-combustion, or oxy-combustion technologies.

''(D) Applicants with test capabilities to address scaling challenges of integrating carbon capture technologies with utility scale power plants.

''(5) CONSIDERATIONS.—In awarding funds for the operation of the Centers under this subsection, the Secretary shall ensure that—

''(A) the portfolio of Centers includes a diverse representation of regional and resource characteristics; and

''(B) each new Center established using such funds demonstrates unique research capabilities, unique regional benefits, or new technology development opportunities.

''(6) SCHEDULE.—Each grant to operate a Center under this subsection shall be awarded for a term of not more than 5 years, subject to the availability of appropriations. The Secretary may renew such 5-year term without limit, subject to a rigorous merit review.

''(7) COST SHARING.—The Secretary shall require cost sharing under this subsection in accordance with section 988.

''(8) TERMINATION.—To the extent otherwise authorized by law, the Secretary may eliminate a Center during any 5-year term described in paragraph (6) if such Center is underperforming.

''(f) DEMONSTRATIONS.—

''(1) IN GENERAL.—The Secretary may fund large-scale demonstration projects for power systems that test the scale of technology necessary to gain the operational data needed to understand the technical and performance risks of the technology before the application of the technology at commercial scale, in accordance with this subsection.

''(2) ENGINEERING AND DESIGN STUDIES.—The Secretary is authorized to fund front-end engineering and design studies in addition to, or in advance of, issuing an award for a demonstration project under this subsection.

''(3) APPLICATION.—An entity seeking an award to conduct a demonstration project under this subsection shall submit to the Secretary an application at such time and in such manner as the Secretary may require.

''(4) LIMITATIONS.—The Secretary shall only provide an award under this subsection after reviewing each applicant and application regarding—

''(A) financial strength;

''(B) construction schedule;

''(C) market risk; and

''(D) contractor history.

''(5) REQUIREMENTS.—A demonstration project funded under this subsection shall—

''(A) utilize technologies that have completed pilot-scale testing or the equivalent, as determined by the Secretary;

''(B) secure and maintain agreements for the utilization or sequestration of captured carbon dioxide; and

''(C) upon completion, demonstrate carbon capture technologies on a power system producing not less than 100 megawatts of power.

''(6) COST SHARING.—The Secretary shall require cost sharing under this subsection in accordance with section 988.

''(g) DEFINITION OF POWER SYSTEM.—In this section, the term 'power system' means any electricity generating unit that utilizes fossil fuels to generate electricity provided to the electric grid or directly to a consumer.

''(h) AUTHORIZATION OF APPROPRIATIONS.—For activities under this section, there are authorized to be appropriated to the Secretary—

''(1) $300,000,000 for fiscal year 2019;

''(2) $315,000,000 for fiscal year 2020;

''(3) $330,750,000 for fiscal year 2021;

''(4) $347,288,000 for fiscal year 2022; and

''(5) $364,652,000 for fiscal year 2023.''.

(b) GAO STUDY.—

(1) IN GENERAL.—The Comptroller General of the United States shall conduct a study of the Department's successes, failures, practices, and improvements in carrying out demonstration projects for carbon capture technologies for power systems. In conducting the study, the Comptroller General shall consider, at a minimum—

(A) applicant and contractor qualifications;

(B) project management practices at the Department;

(C) economic or market changes and other factors impacting project viability;

(D) completion of third-party agreements, including power purchase agreements and carbon dioxide offtake agreements;

(E) regulatory challenges; and

(F) construction challenges.

(2) REPORT.—Not later than 1 year after the date of enactment of this Act, the Comptroller Gen-

eral of the United States 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 the study required under paragraph (1).

(3) CONSIDERATION.—The Secretary shall consider any relevant recommendations, as determined by the Secretary, provided in the study required under paragraph (1), and shall adopt such recommendations as the Secretary considers appropriate.

(4) POWER SYSTEM DEFINED.—In this section, the term ''power system'' means any electricity generating unit that utilizes fossil fuels to generate electricity provided to the electric grid or directly to a consumer.

SEC. 6. CARBON STORAGE VALIDATION AND TESTING.

Section 963 of the Energy Policy Act of 2005 (42 U.S.C. 16293) is amended to read as follows:

''SEC. 963. CARBON STORAGE VALIDATION AND TESTING.

''(a) CARBON STORAGE.—The Secretary shall carry out a program of research, development, and demonstration for carbon storage. The program shall—

''(1) in coordination with relevant Federal agencies, develop and maintain mapping tools and resources that assess the capacity of geologic storage formations in the United States;

''(2) develop monitoring tools, modeling of geologic formations, and analyses to predict and verify carbon dioxide containment and account for sequestered carbon dioxide in geologic storage sites;

''(3) research potential environmental, safety, and health impacts in the event of a leak to the atmosphere or to an aquifer, and any corresponding mitigation actions or responses to limit harmful consequences;

''(4) evaluate the interactions of carbon dioxide with formation solids and fluids, including the propensity of injections to induce seismic activity;

''(5) assess and ensure the safety of operations related to geologic sequestration of carbon dioxide;

''(6) determine the fate of carbon dioxide concurrent with and following injection into geologic formations; and

''(7) provide information to State, local, and Tribal governments, the Environmental Protection Agency, and other appropriate entities, to support development of a regulatory framework for commer-

cial-scale sequestration operations that ensure the protection of human health and the environment.

''(b) GEOLOGIC SETTINGS.—In carrying out research activities under this section, the Secretary shall consider a variety of candidate geologic settings, including—

''(1) operating oil and gas fields;

''(2) depleted oil and gas fields;

''(3) residual oil zones;

''(4) unconventional reservoirs and rock types;

''(5) unmineable coal seams;

''(6) deep saline formations;

''(7) deep geologic systems that may be used as engineered reservoirs to extract economical quantities of brine from geothermal resources of low permeability or porosity; and

''(8) deep geologic systems containing in situ carbon dioxide mineralization formations.

''(c) REGIONAL CARBON SEQUESTRATION PARTNERSHIPS.—

''(1) IN GENERAL.—The Secretary shall carry out large-scale carbon sequestration demonstrations for geologic containment of carbon dioxide to collect and validate information on the cost and feasibility of commercial deployment of technologies for the geologic containment of carbon dioxide. The Sec-

retary may fund new demonstrations or expand the work completed at 1 or more of the existing regional carbon sequestration partnerships.

''(2) DEMONSTRATION COMPONENTS.—Each demonstration described in paragraph (1) shall include longitudinal tests involving carbon dioxide injection and monitoring, mitigation, and verification operations.

''(3) CLEARINGHOUSE.—The National Energy Technology Laboratory shall act as a clearinghouse of shared information and resources for the regional carbon sequestration partnerships and any new demonstrations funded under this section.

''(4) REPORT.—Not later than 1 year after the date of enactment of the Fossil Energy Research and Development Act of 2018, the Secretary shall provide to the Committee on Science, Space, and Technology of the House of Representatives and the Committee on Energy and Natural Resources of the Senate a report that—

''(A) assesses the progress of all regional carbon sequestration partnerships;

''(B) identifies the remaining challenges in achieving carbon sequestration that is reliable

and safe for the environment and public health; and

''(C) creates a roadmap to integrate geologic sequestration sites and carbon utilization with large sources of carbon dioxide in the United States economy.

''(5) LARGE-SCALE CARBON SEQUESTRATION.—For purposes of this subsection, 'large-scale carbon sequestration' means the injection of more than 1,000,000 tons of carbon dioxide annually or a scale that demonstrates the ability to inject and sequester several million metric tons carbon dioxide for at least 10 years.

''(d) INTEGRATED STORAGE PROJECTS.—The Secretary may carry out a program for purposes of transitioning the large-scale storage demonstrations under subsection (c) into integrated, commercial storage complexes. The program shall focus on—

''(1) qualifying geologic storage sites in order to accept large volumes of carbon dioxide acceptable for commercial contracts;

''(2) understanding the technical and commercial viability of storage sites;

''(3) developing the qualification processes that will be necessary for a diverse range of geologic storage sites to commercially accept carbon dioxide; and

''(4) any other activities the Secretary deems necessary to transition the large scale demonstration storage projects into commercial ventures.

''(e) COST SHARING.—The Secretary shall require cost sharing under this section in accordance with section 988.

''(f) AUTHORIZATION OF APPROPRIATIONS.—For activities under this section, there are authorized to be appropriated to the Secretary—

''(1) $105,000,000 for fiscal year 2019;

''(2) $110,250,000 for fiscal year 2020;

''(3) $115,763,000 for fiscal year 2021;

''(4) $121,551,000 for fiscal year 2022; and

''(5) $127,628,000 for fiscal year 2023.''.

SEC. 7. CARBON UTILIZATION.

(a) PROGRAM.—Subtitle F of title IX of the Energy Policy Act of 2005 (42 U.S.C. 16291 et seq.) is amended by adding at the end the following:

''SEC. 969. CARBON UTILIZATION.

''(a) IN GENERAL.—The Secretary shall carry out a program of research, development, and demonstration for carbon utilization. The program shall—

''(1) assess and monitor potential changes in life cycle carbon dioxide emissions, and other environmental safety indicators of new technologies, practices, processes, or methods, used in enhanced hydrocarbon recovery;

''(2) identify and evaluate novel uses for carbon, including the conversion of carbon dioxide for commercial and industrial products, such as—

''(A) chemicals;

''(B) plastics;

''(C) building materials;

''(D) fuels;

''(E) cement; or

''(F) products of coal utilization in power systems (as such term is defined in section 962(e)), or other applications; and

''(3) identify and develop alternative uses for coal, including products derived from carbon engineering, carbon fiber, and coal conversion methods.

''(b) AUTHORIZATION OF APPROPRIATIONS.—For activities under this section, there are authorized to be appropriated to the Secretary—

''(1) $25,000,000 for fiscal year 2019;

''(2) $26,250,000 for fiscal year 2020;

''(3) $27,562,500 for fiscal year 2021;

''(4) $28,940,625 for fiscal year 2022; and

''(5) $30,387,656 for fiscal year 2023.''.

(b) STUDY.—The Secretary shall enter into an agreement with the National Academies to conduct a study assessing the barriers and opportunities related to commercializing carbon dioxide in the United States. Such study shall—

(1) analyze the technical feasibility and related challenges to commercializing carbon dioxide, including—

(A) creating a national system of carbon dioxide pipelines;

(B) mitigating environmental impacts; and

(C) regional economic challenges and opportunities;

(2) identify potential markets, industries, or sectors that may benefit from greater access to commercial carbon dioxide;

(3) assess the current state of infrastructure and any necessary updates to allow for the integration of safe and reliable carbon dioxide transportation, utilization, and storage;

(4) estimate the economic impact of a well-integrated national carbon dioxide pipeline system;

(5) assess the global status and progress of carbon utilization technologies (both chemical and biological) in practice today that utilize waste carbon (including carbon dioxide, carbon monoxide, methane, and biogas) from power generation, biofuels production, and other industrial processes;

(6) identify emerging technologies and approaches for carbon utilization that show promise for scale-up, demonstration, deployment, and commercialization;

(7) analyze the factors associated with making carbon utilization technologies viable at a commercial scale, including carbon waste stream availability, economics, market capacity, energy and lifecycle requirements;

(8) assess the major technical challenges associated with increasing the commercial viability of carbon reuse technologies, and identify the research and development questions that will address those challenges;

(9) assess current research efforts, including basic, applied, engineering, and computational, that are addressing these challenges and identify gaps in the current research portfolio; and

(10) develop a comprehensive research agenda that addresses both long- and short-term research needs and opportunities.

SEC. 8. ADVANCED ENERGY SYSTEMS.

Subtitle F of title IX of the Energy Policy Act of 2005 (42 U.S.C. 16291 et seq.) is further amended by adding at the end the following:

"SEC. 969A. ADVANCED ENERGY SYSTEMS.

''(a) IN GENERAL.—The Secretary shall conduct a program of research, development, demonstration, and commercial application to improve the efficiency and reliability of, and to reduce emissions from, fossil fuel power generation in the following areas:

''(1) High-efficiency turbines for any advanced power system that will lead to natural gas turbine combined cycle efficiency of 67 percent or combustion turbine efficiency of 50 percent.

''(2) Supercritical and ultrasupercritical carbon dioxide, with an emphasis on developing directly-fired and indirectly fired cycles in the next 10 years.

''(3) Advanced combustion systems, including oxy-combustion systems and chemical looping.

''(4) Fuel cell technologies for low-cost, high-efficiency, fuel-flexible, modular power systems, including solid oxide fuel cell technology for commercial,

residential, and distributed generation systems, using improved manufacturing production and processes.

''(5) Gasification systems to enable carbon capture, improve efficiency, and reduce capital and operating costs.

''(6) Thermal cycling with ramping or rapid black start capabilities that do not compromise efficiency or environmental performance.

''(7) Small-scale and modular coal-fired technologies with reduced carbon outputs or carbon capture that can support incremental power generation capacity additions.

''(b) PRIORITY.—In carrying out the program under subsection (a), the Secretary is encouraged to prioritize transformational technologies that enable a step change in performance, efficiency, or cost of electricity as compared to the technology in existence on the date of enactment of this section.

''(c) AUTHORIZATION OF APPROPRIATIONS.—For activities under this section, there are authorized to be appropriated to the Secretary—

''(1) $118,000,000 for fiscal year 2019;

''(2) $123,900,000 for fiscal year 2020;

''(3) $130,095,000 for fiscal year 2021;

''(4) $136,600,000 for fiscal year 2022; and

''(5) $143,430,000 for fiscal year 2023.''.

SEC. 9. RARE EARTH ELEMENTS.

Subtitle F of title IX of the Energy Policy Act of 2005 (42 U.S.C. 16291 et seq.) is further amended by adding at the end the following:

''SEC. 969B. RARE EARTH ELEMENTS.

''(a) IN GENERAL.—In coordination with the relevant Federal agencies, the Secretary shall conduct research to develop and assess methods to separate and recover rare earth elements and other strategic minerals and coproducts from coal and coal byproduct streams. The program shall—

''(1) develop advanced rare earth element separation and extraction processes using coal-based resources as feedstock materials; and

''(2) assess the technical and economic feasibility of recovering rare earth elements from coal-based resources and validate such feasibility with prototype systems producing salable, high-purity rare earth elements from coal-based resources.

''(b) AUTHORIZATION OF APPROPRIATIONS.—For activities under this section, there are authorized to be appropriated to the Secretary—

''(1) $20,000,000 for fiscal year 2019;

''(2) $21,000,000 for fiscal year 2020;

''(3) $22,050,000 for fiscal year 2021;

''(4) $23,153,000 for fiscal year 2022; and

''(5) $24,310,000 for fiscal year 2023.''.

SEC. 10. INTERAGENCY TASK FORCE ON CARBON DIOXIDE PIPELINES.

(a) IN GENERAL.—Not later than 90 days after the date of enactment of this Act, the Secretary shall convene an interagency task force to assess the potential for a national system of carbon dioxide pipelines.

(b) MEMBERSHIP.—The task force described in subsection (a) shall include representation from each of the following:

(1) The Department of Energy.

(2) The Department of the Interior.

(3) The Environmental Protection Agency.

(4) The Department of Transportation.

(5) The Federal Energy Regulatory Commission.

(6) Other Federal agencies identified by the Secretary.

(7) State, local, or Tribal governments.

(c) DUTIES.—The task force described in subsection (a) shall—

(1) conduct annual workshops with relevant Federal agencies to discuss the potential of and progress toward an accessible and functioning national system of carbon dioxide pipelines, open to representatives from—

(A) industry;

(B) State, local, and Tribal governments;

(C) academic researchers;

(D) environmental organizations; and

(E) other stakeholders as identified by the Secretary;

(2) the Secretary shall provide public notice not less than 60 days before conducting each workshop under paragraph (1), to ensure all interested parties can attend;

(3) provide 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 annual report summarizing the activities and progress of the task force; and

(4) in place of the final such annual report, submit to the relevant congressional committees a report laying out a roadmap for the successful establishment of a national carbon dioxide pipeline system, including aspects related to—

(A) engineering, building, siting, and maintenance of the system;

(B) permitting and insuring pipelines;

(C) Federal and State policy challenges;

(D) incentives or resources to encourage the utilization of the most advanced leak detection and mitigation technologies and monitoring capabilities;

(E) regulating the national system to ensure safety and minimal environmental impacts; and

(F) possible integrations into the current pipeline systems.

(d) SUNSET.—The authority for the task force under this section expires on the date that is 5 years after the date on which the task force first convenes.

SEC. 11. METHANE HYDRATES RESEARCH AMENDMENTS.

(a) IN GENERAL.—Section 4(b) of the Methane Hydrate Research and Development Act of 2000 (30 U.S.C. 2003(b)) is amended to read as follows:

''(b) GRANTS, CONTRACTS, COOPERATIVE AGREEMENTS, INTERAGENCY FUNDS TRANSFER AGREEMENTS, AND FIELD WORK PROPOSALS.—

''(1) ASSISTANCE AND COORDINATION.—In carrying out the program of methane hydrate research

and development authorized by this section, the Secretary may award grants, or enter into contracts or cooperative agreements to—

"(A) conduct basic and applied research—

"(i) to identify and assess deposits of methane hydrate; and

"(ii) to identify the environmental, health, and safety impacts of methane hydrate development;

"(B) assess and develop technologies to mitigate environmental impacts of the commercial development of methane hydrate as an energy resource and to reduce the public health and safety risks of drilling through methane hydrates;

"(C) conduct basic and applied research to assess and mitigate the environmental impact of hydrate degassing (including natural degassing and degassing associated with commercial development); or

"(D) expand education and training programs in methane hydrate resource research and resource development through fellowships or other means for graduate education and training.

''(2) ENVIRONMENTAL MONITORING AND RESEARCH.—The Secretary shall conduct a long-term environmental monitoring and research program to study the effects of production from methane hydrate reservoirs.

''(3) COMPETITIVE PEER REVIEW.—Funds made available to carry out paragraphs (1) and (2) shall be made available based on a competitive process using external scientific peer review of proposed research.''.

(b) CONFORMING AMENDMENT.—Section 4(e) of such Act (30 U.S.C. 2003(e)) is amended in the matter preceding paragraph (1) by striking ''subsection (b)(1)'' and inserting ''paragraphs (1) and (2) of subsection (b)''.

(c) AUTHORIZATION OF APPROPRIATIONS.—Section 7 of such Act (30 U.S.C. 2006) is amended to read as follows:

''SEC. 7. AUTHORIZATION OF APPROPRIATIONS.

''There are authorized to be appropriated to the Secretary to carry out this Act $15,000,000, to remain available until expended, for each of fiscal years 2019 through 2023.''.

SEC. 12. CARBON REMOVAL.

Subtitle F of title IX of the Energy Policy Act of 2005 (42 U.S.C. 16291 et seq.) is further amended by adding at the end the following:

"SEC. 969C. CARBON REMOVAL.

''(a) ESTABLISHMENT.—The Secretary, in coordination with the appropriate Federal agencies, shall establish a research, development, and demonstration program to test, validate, or improve technologies and strategies to remove carbon dioxide from the atmosphere on a large scale. The program may include activities in—

''(1) direct air capture technologies;

''(2) bioenergy with carbon capture and sequestration;

''(3) enhanced geological weathering;

''(4) agricultural and grazing practices;

''(5) forest management and afforestation; and

''(6) planned or managed carbon sinks, including natural and artificial.

''(b) CONSIDERATIONS.—The program under this section shall identify and develop carbon removal technologies and strategies that consider the following:

''(1) Land use changes.

''(2) Ocean acidification.

''(3) Net greenhouse gas emissions.

''(4) Commercial viability.

''(5) Potential for near-term impact.

''(6) Potential for carbon reductions on a gigaton scale.

''(7) Economic co-benefits.

''(c) PRIORITIZATION.—In carrying out the program under this section, the Secretary shall prioritize technologies and strategies that have the potential to meet emissions reduction goals in the agreement of the twenty-first session of the Conference of the Parties to the United Nations Framework Convention on Climate Change.

''(d) ACCOUNTING.—The Department shall collaborate with the Environmental Protection Agency and other relevant agencies to develop and improve accounting frameworks and tools to accurately measure carbon removal and sequestration methods and technologies across the Federal Government.

''(e) AIR CAPTURE TECHNOLOGY PRIZE.—Not later than 1 year after the date of enactment of this Act, as part of the program carried out under this section, the Secretary shall carry out a program to award competitive technology prizes for carbon dioxide capture from media in which the concentration of carbon dioxide is less than 1 percent by volume (in this subsection, known as 'dilute media'). In carrying out this subsection, the Secretary shall—

''(1) in accordance with section 24 of the Stevenson-Wydler Technology Innovation Act of 1980, develop requirements for—

''(A) the prize competition process;

''(B) minimum performance standards for projects eligible to participate in the prize competition; and

''(C) monitoring and verification procedures for projects selected to receive a prize award;

''(2) establish minimum levels for the capture of carbon dioxide from dilute media that are required to qualify for a prize award; and

''(3) offer prize awards for any of the following:

''(A) A design for a promising capture technology that will—

''(i) be operated on a demonstration scale; and

''(ii) have the potential to achieve significant reduction in the level of carbon dioxide in the atmosphere.

''(B) A successful bench-scale demonstration of a capture technology.

''(C) An operational capture technology on a commercial scale.

''(f) INTRA-AGENCY RESEARCH.—The Secretary shall encourage and promote crosscutting research and development in bioenergy with carbon capture and sequestration within the Department.

''(g) AUTHORIZATION OF APPROPRIATIONS.—For activities under this section, there are authorized to be appropriated to the Secretary—

''(1) $45,000,000 for fiscal year 2018, $15,000,000 of which are authorized to carry out subsection (e);

''(2) $31,500,000 for fiscal year 2019;

''(3) $33,075,000 for fiscal year 2019;

''(4) $34,729,000 for fiscal year 2019; and

''(5) $36,465,000 for fiscal year 2020.''.

SEC. 13. METHANE LEAK DETECTION AND MITIGATION.

(a) PROGRAM.—Subtitle F of title IX of the Energy Policy Act of 2005 (42 U.S.C. 16291 et seq.) is further amended by adding at the end the following:

''SEC. 969D. METHANE LEAK DETECTION AND MITIGATION.

''(a) IN GENERAL.—The Secretary, in coordination with the appropriate Federal agencies, shall carry out a program of methane leak detection and mitigation research, development, demonstration, and commercial application for technologies and methods that significantly

reduce emissions. In carrying out the program, the Secretary shall—

''(1) develop cooperative agreements with State or local governments or private entities to provide technical assistance to—

''(A) prevent or respond to methane leaks, including detection, mitigation, and identification of leaks throughout the natural gas infrastructure (which includes natural gas storage, pipelines, and natural gas production sites); and

''(B) protect public health in the event of a major methane leak;

''(2) promote demonstration and adoption of effective methane emissions-reduction technologies in the private sector;

''(3) in coordination with representatives from private industry, State and local governments, and institutions of higher education, create a publicly accessible resource for best practices in the design, construction, maintenance, performance, monitoring, and incident response for—

''(A) pipeline systems;

''(B) wells;

''(C) compressor stations;

''(D) storage facilities; and

''(E) other vulnerable infrastructure;

''(4) identify high-risk characteristics of pipelines, wells, and materials, geologic risk factors, or other key factors that increase the likelihood of methane leaks; and

''(5) in collaboration with private entities and institutions of higher education, quantify and map significant methane leaks across the United States.

''(b) CONSIDERATIONS.—In carrying out the program under this section, the Secretary shall consider the following:

''(1) Historical data of methane leaks.

''(2) Public health consequences.

''(3) Public safety.

''(4) Novel materials and designs for pipelines, compressor stations, components, and well casings.

''(5) Regional geologic traits.

''(6) Induced and natural seismicity.

''(c) AUTHORIZATION OF APPROPRIATIONS.—For activities under this section, there are authorized to be appropriated to the Secretary—

''(1) $20,000,000 for fiscal years 2019;

''(2) $21,000,000 for fiscal years 2020;

''(3) $22,050,000 for fiscal years 2021;

''(4) $23,153,000 for fiscal years 2022; and

''(5) $24,310,000 for fiscal years 2023.''.

(b) REPORT.—Not later than 1 year after the date of enactment of this Act, the Secretary, in coordination with the Secretary of Transportation, shall submit to the Committee on Science, Space, and Technology, the Committee on Transportation and Infrastructure, and the Committee on Energy and Commerce of the House of Representatives and the Committee on Energy and Natural Resources and the Committee on Commerce, Science, and Transportation of the Senate a report on mitigating natural gas storage leaks. The report shall include the following:

(1) A quantitative study to evaluate the key uncertainties related to the costs and benefits of downhole safety valves for the natural gas storage industry in the United States, including—

(A) malfunction and failure rates of modern downhole safety valve designs;

(B) the frequency of well failures; and

(C) alternative emergency valve designs.

(2) A systematic assessment of casing wall thickness assessment tools, which shall—

(A) consider multiple tool types and reference wells; and

(B) rigorously test and compare the ability of these tools and techniques to identify, locate, and characterize corroded well casings.

SEC. 14. NATIONAL ENERGY TECHNOLOGY LABORATORY REFORMS.

(a) SPECIAL HIRING AUTHORITY FOR SCIENTIFIC, ENGINEERING, AND PROJECT MANAGEMENT PERSONNEL.—

(1) IN GENERAL.—The Director of the National Energy Technology Laboratory shall have the authority to—

(A) make appointments to positions in the Laboratory to assist in meeting a specific project or research need, without regard to civil service laws, of individuals who—

(i) have an advanced scientific or engineering background; or

(ii) have a business background and can assist in specific technology-to-market needs;

(B) fix the basic pay of any employee appointed under this section at a rate not to exceed level II of the Executive Schedule; and

(C) pay any employee appointed under this section payments in addition to basic pay, ex-

cept that the total amount of additional payments paid to an employee under this subsection for any 12-month period shall not exceed the least of—

(i) $25,000;

(ii) the amount equal to 25 percent of the annual rate of basic pay of that employee; and

(iii) the amount of the limitation that is applicable for a calendar year under section 5307(a)(1) of title 5, United States Code.

(2) LIMITATIONS.—

(A) IN GENERAL.—The term of any employee appointed under this section shall not exceed 3 years.

(B) FULL-TIME EMPLOYEES.—Not more than 10 full-time employees appointed under this subsection may be employed at the National Energy Technology Laboratory at any given time.

(b) DISCRETIONARY RESEARCH AND DEVELOPMENT.—

(1) IN GENERAL.—The Secretary shall establish mechanisms under which the Director of the Na-

tional Energy Technology Laboratory may use an amount of funds equal to an amount that is not less than 2 percent and not more than 4 percent of all funds available to the Laboratory for the following purposes:

(A) To fund innovative research that is conducted at the Laboratory and supports the mission of the Department.

(B) To fund technology development programs that support the transition of technologies developed by the Laboratory into the commercial market.

(C) To fund workforce development activities to strengthen external engineering and manufacturing partnerships to ensure safe, efficient, productive, and useful fossil energy technology production.

(D) To fund the revitalization, recapitalization, or minor construction of the Laboratory infrastructure.

(2) PRIORITIZATION.—The Director shall prioritize innovative experiments and proposals proposed by scientists and researchers at the National Energy Technology Laboratory.

(3) ANNUAL REPORT ON USE OF AUTHORITY.—Not later than March 1 of each year, 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 use of the authority under this subsection during the preceding fiscal year.

(c) REVIEW.—Not later than 2 years after the date of enactment of this Act, 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 assessing the National Energy Technology Laboratory's management and research. The report shall include—

(1) an assessment of the quality of science and research at the National Energy Technology Laboratory relative to similar work at other national laboratories;

(2) a review of the effectiveness of authorities provided in subsections (a) and (b); and

(3) recommendations for policy changes within the Department and legislative changes to provide the National Energy Technology Laboratory the nec-

essary tools and resources to advance its research mission.