

(F) advanced high performance compressor technology; and

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

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

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

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

(5) increase fuel flexibility by enabling gas turbines to operate with high proportions of, or pure, hydrogen or other renewable gas fuels;

(6) enhance foundational knowledge needed for low-emission combustion systems that can work in high-pressure, high-temperature environments required for high-efficiency cycles;

(7) increase operational flexibility by reducing turbine start-up times and improving the ability to accommodate flexible power demand; and

(8) include any other elements necessary to achieve the goals described in subsection (c), as determined by the Secretary, in consultation with private industry.

**(c) Program goals**

**(1) In general**

The goals of the program shall be—

(A) in phase I, to develop a conceptual design of, and to develop and demonstrate the technology required for—

(i) advanced high efficiency gas turbines to achieve, on a lower heating value basis—

(I) a combined cycle efficiency of not less than 65 percent; or

(II) a simple cycle efficiency of not less than 47 percent; and

(ii) aviation gas turbines to achieve a 25 percent reduction in fuel burn by improving fuel efficiency to existing best-in-class turbo-fan engines; and

(B) in phase II, to develop a conceptual design of advanced high efficiency gas turbines that can achieve, on a lower heating value basis—

(i) a combined cycle efficiency of not less than 67 percent; or

(ii) a simple cycle efficiency of not less than 50 percent.

**(2) Additional goals**

If a goal described in paragraph (1) has been achieved, the Secretary, in consultation with private industry and the National Academy of Sciences, may develop additional goals or phases for advanced gas turbine research and development.

**(d) Financial assistance**

**(1) In general**

The Secretary may provide financial assistance, including grants, to carry out the program.

**(2) Proposals**

Not later than 180 days after December 27, 2020, the Secretary shall solicit proposals from

industry, small businesses, universities, and other appropriate parties for conducting activities under this section.

**(3) Considerations**

In selecting proposed projects to receive financial assistance under this subsection, the Secretary shall give special consideration to the extent to which the proposed project will—

(A) stimulate the creation or increased retention of jobs in the United States; and

(B) promote and enhance technology leadership in the United States.

**(4) Competitive awards**

The Secretary shall provide financial assistance under this subsection on a competitive basis, with an emphasis on technical merit.

**(5) Cost sharing**

Financial assistance provided under this subsection shall be subject to the cost sharing requirements of section 16352 of this title.

**(e) Authorization of appropriations**

There is authorized to be appropriated to carry out this section \$50,000,000 for each of fiscal years 2021 through 2025.

(Pub. L. 109–58, title IX, § 969B, as added Pub. L. 116–260, div. Z, title IV, § 4005(a), Dec. 27, 2020, 134 Stat. 2542.)

**§ 16298c. 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 (referred to in this section as the “Director”) may—

(A) make appointments to positions in the National Energy Technology 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 subparagraph (A) at a rate not to exceed level II of the Executive Schedule under section 5313 of title 5; and

(C) pay any employee appointed under subparagraph (A) payments in addition to the basic pay fixed under subparagraph (B), subject to the condition that the total amount of additional payments paid to an employee under this subparagraph 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.

**(2) Limitations**

**(A) In general**

The term of any employee appointed under paragraph (1)(A) shall not exceed 3 years.

**(B) Full-time employees**

Not more than 10 full-time employees appointed under paragraph (1)(A) may be employed at the National Energy Technology Laboratory at any given time.

**(b) Laboratory-directed research and development****(1) In general**

Beginning in fiscal year 2021, the National Energy Technology Laboratory shall be eligible for laboratory-directed research and development funding.

**(2) Authorization of funding****(A) In general**

Each fiscal year, of funds made available to the National Energy Technology Laboratory, the Secretary may deposit an amount, not to exceed the rate made available to the National Laboratories for laboratory-directed research and development, in a special fund account.

**(B) Use**

Amounts in the account under subparagraph (A) shall only be available for laboratory-directed research and development.

**(C) Requirements**

The account under subparagraph (A)—

- (i) shall be administered by the Secretary;
- (ii) shall be available without fiscal year limitation; and
- (iii) shall not be subject to appropriation.

**(3) Requirement**

The Director shall carry out laboratory-directed research and development activities at the National Energy Technology Laboratory consistent with Department of Energy Order 413.2C, dated August 2, 2018 (or a successor order).

**(4) Annual report on use of authority**

Annually, 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 on the use of the authority provided under this subsection during the preceding fiscal year.

**(c) Laboratory operations**

The Secretary shall delegate human resources operations of the National Energy Technology Laboratory to the Director to assist in carrying out this section.

**(d) Review**

Not later than 2 years after December 27, 2020, 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 assessing the management and research activities of the National Energy Technology Laboratory, which 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 with the necessary tools and resources to advance the research mission of the National Energy Technology Laboratory.

(Pub. L. 109–58, title IX, §969C, as added Pub. L. 116–260, div. Z, title IV, § 4006(a), Dec. 27, 2020, 134 Stat. 2544.)

**§ 16298d. Carbon removal****(a) Establishment**

The Secretary, in coordination with the heads of appropriate Federal agencies, including the Secretary of Agriculture, shall establish a research, development, and demonstration program (referred to in this section as the “program”) to test, validate, or improve technologies and strategies to remove carbon dioxide from the atmosphere on a large scale.

**(b) Intraagency coordination**

The Secretary shall ensure that the program includes the coordinated participation of the Office of Fossil Energy, the Office of Science, and the Office of Energy Efficiency and Renewable Energy.

**(c) Program activities**

The program may include research, development, and demonstration activities relating to—

- (1) direct air capture and storage technologies;
- (2) bioenergy with carbon capture and sequestration;
- (3) enhanced geological weathering;
- (4) agricultural practices;
- (5) forest management and afforestation; and
- (6) planned or managed carbon sinks, including natural and artificial.

**(d) Requirements**

In developing and identifying carbon removal technologies and strategies under the program, the Secretary shall consider—

- (1) land use changes, including impacts on natural and managed ecosystems;
- (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; and
- (7) economic cobenefits.

**(e) Air capture prize competitions****(1) Definitions**

In this subsection:

**(A) Dilute media**

The term “dilute media” means media in which the concentration of carbon dioxide is less than 1 percent by volume.

**(B) Prize competition**

The term “prize competition” means the competitive technology prize competition established under paragraph (2).

**(C) Qualified carbon dioxide****(i) In general**

The term “qualified carbon dioxide” means any carbon dioxide that—