

(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 activi-

ties 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—

- (I) is captured directly from the ambient air; and
- (II) is measured at the source of capture and verified at the point of disposal, injection, or utilization.

(ii) Inclusion

The term “qualified carbon dioxide” includes the initial deposit of captured carbon dioxide used as a tertiary injectant.

(iii) Exclusion

The term “qualified carbon dioxide” does not include carbon dioxide that is recaptured, recycled, and reinjected as part of the enhanced oil and natural gas recovery process.

(D) Qualified direct air capture facility**(i) In general**

The term “qualified direct air capture facility” means any facility that—

- (I) uses carbon capture equipment to capture carbon dioxide directly from the ambient air; and
- (II) captures more than 50,000 metric tons of qualified carbon dioxide annually.

(ii) Exclusion

The term “qualified direct air capture facility” does not include any facility that captures carbon dioxide—

- (I) that is deliberately released from naturally occurring subsurface springs; or
- (II) using natural photosynthesis.

(2) Establishment

Not later than 2 years after December 27, 2020, the Secretary, in consultation with the Administrator of the Environmental Protection Agency, shall establish as part of the program a competitive technology prize competition to award prizes for—

- (A) precommercial carbon dioxide capture from dilute media; and
- (B) commercial applications of direct air capture technologies.

(3) Requirements

In carrying out this subsection, the Secretary, in accordance with section 3719 of title 15, shall develop requirements for—

- (A) the prize competition process; and
- (B) monitoring and verification procedures for projects selected to receive a prize under the prize competition.

(4) Eligible projects**(A) Precommercial air capture projects**

With respect to projects described in paragraph (2)(A), to be eligible to be awarded a

prize under the prize competition, a project shall—

- (i) meet minimum performance standards set by the Secretary;
- (ii) meet minimum levels set by the Secretary for the capture of carbon dioxide from dilute media; and
- (iii) demonstrate in the application of the project for a prize—
 - (I) a design for a promising carbon capture technology that will—
 - (aa) be operated on a demonstration scale; and
 - (bb) have the potential to achieve significant reduction in the level of carbon dioxide in the atmosphere;
 - (II) a successful bench-scale demonstration of a carbon capture technology; or
 - (III) an operational carbon capture technology on a commercial scale.

(B) Commercial direct air capture projects**(i) In general**

With respect to projects described in paragraph (2)(B), the Secretary shall award prizes under the prize competition to qualified direct air capture facilities for metric tons of qualified carbon dioxide captured and verified at the point of disposal, injection, or utilization.

(ii) Amount of award

The amount of the award per metric ton under clause (i)—

- (I) shall be equal for each qualified direct air capture facility selected for a prize under the prize competition; and
- (II) shall be determined by the Secretary and in any case shall not exceed—
 - (aa) \$180 for qualified carbon dioxide captured and stored in saline storage formations;
 - (bb) a lesser amount, as determined by the Secretary, for qualified carbon dioxide captured and stored in conjunction with enhanced oil recovery operations; or
 - (cc) a lesser amount, as determined by the Secretary, for qualified carbon dioxide captured and utilized in any activity consistent with section 45Q(f)(5) of title 26.

(iii) Requirement

The Secretary shall make awards under this subparagraph until appropriated funds are expended.

(f) Direct air capture test center**(1) In general**

Not later than 2 years after December 27, 2020, the Secretary shall award grants to 1 or more entities for the operation of 1 or more test centers (referred to in this subsection as a “Center”) to provide distinct testing capabilities for innovative direct air capture and storage technologies.

(2) Purpose

Each Center shall—

- (A) advance research, development, demonstration, and commercial application of direct air capture and storage technologies;

(B) support large-scale pilot and demonstration projects and test direct air capture and storage technologies; and

(C) develop front-end engineering design and economic analysis.

(3) Selection

(A) In general

The Secretary shall select entities to receive grants under this subsection according to such criteria as the Secretary may develop.

(B) Competitive basis

The Secretary shall select entities to receive grants under this subsection on a competitive basis.

(C) Priority criteria

In selecting entities to receive grants under this subsection, the Secretary shall prioritize consideration of applicants that—

(i) have access to existing or planned research facilities for direct air capture and storage technologies;

(ii) are institutions of higher education with established expertise in engineering for direct air capture and storage technologies, or partnerships with such institutions of higher education; or

(iii) have access to existing research and test facilities for bulk materials design and testing, component design and testing, or professional engineering design.

(4) Formula for awarding grants

The Secretary may develop a formula for awarding grants under this subsection.

(5) Schedule

(A) In general

Each grant awarded under this subsection shall be for a term of not more than 5 years, subject to the availability of appropriations.

(B) Renewal

The Secretary may renew a grant for 1 or more additional 5-year terms, subject to a competitive merit review and the availability of appropriations.

(6) Termination

To the extent otherwise authorized by law, the Secretary may eliminate, and terminate grant funding under this subsection for, a Center during any 5-year term described in paragraph (5) if the Secretary determines that the Center is underperforming.

(g) Pilot and demonstration projects

In supporting the technology development activities under this section, the Secretary is encouraged to support carbon removal pilot and demonstration projects, including—

(1) pilot projects that test direct air capture systems capable of capturing 10 to 100 tonnes of carbon oxides per year to provide data for demonstration-scale projects; and

(2) direct air capture demonstration projects capable of capturing greater than 1,000 tonnes of carbon oxides per year.

(h) Intraagency collaboration

In carrying out the program, the Secretary shall encourage and promote collaborations

among relevant offices and agencies within the Department.

(i) Accounting

The Secretary shall collaborate with the Administrator of the Environmental Protection Agency and the heads of other relevant Federal agencies to develop and improve accounting frameworks and tools to accurately measure carbon removal and sequestration methods and technologies.

(j) Regional direct air capture hubs

(1) Definitions

In this subsection:

(A) Eligible project

The term “eligible project” means a direct air capture project or a component project of a regional direct air capture hub.

(B) Regional direct air capture hub

The term “regional direct air capture hub” means a network of direct air capture projects, potential carbon dioxide utilization off-takers, connective carbon dioxide transport infrastructure, subsurface resources, and sequestration infrastructure located within a region.

(2) Establishment of program

(A) In general

The Secretary shall establish a program under which the Secretary shall provide funding for eligible projects that contribute to the development of 4 regional direct air capture hubs described in subparagraph (B).

(B) Regional direct air capture hubs

Each of the 4 regional direct air capture hubs developed under the program under subparagraph (A) shall be a regional direct air capture hub that—

(i) facilitates the deployment of direct air capture projects;

(ii) has the capacity to capture and sequester, utilize, or sequester and utilize at least 1,000,000 metric tons of carbon dioxide from the atmosphere annually from a single unit or multiple interconnected units;

(iii) demonstrates the capture, processing, delivery, and sequestration or end-use of captured carbon; and

(iv) could be developed into a regional or interregional carbon network to facilitate sequestration or carbon utilization.

(3) Selection of projects

(A) Solicitation of proposals

(i) In general

Not later than 180 days after November 15, 2021, the Secretary shall solicit applications for funding for eligible projects.

(ii) Additional solicitations

The Secretary shall solicit applications for funding for eligible projects on a recurring basis after the first round of applications is received under clause (i) until all amounts appropriated to carry out this subsection are expended.

(B) Selection of projects for the development of regional direct air capture hubs

Not later than 3 years after the date of the deadline for the submission of proposals under subparagraph (A)(i), the Secretary shall select eligible projects described in paragraph (2)(A).

(C) Criteria

The Secretary shall select eligible projects under subparagraph (B) using the following criteria:

(i) Carbon intensity of local industry

To the maximum extent practicable, each eligible project shall be located in a region with—

(I) existing carbon-intensive fuel production or industrial capacity; or

(II) carbon-intensive fuel production or industrial capacity that has retired or closed in the preceding 10 years.

(ii) Geographic diversity

To the maximum extent practicable, eligible projects shall contribute to the development of regional direct air capture hubs located in different regions of the United States.

(iii) Carbon potential

To the maximum extent practicable, eligible projects shall contribute to the development of regional direct air capture hubs located in regions with high potential for carbon sequestration or utilization.

(iv) Hubs in fossil-producing regions

To the maximum extent practicable, eligible projects shall contribute to the development of at least 2 regional direct air capture hubs located in economically distressed communities in the regions of the United States with high levels of coal, oil, or natural gas resources.

(v) Scalability

The Secretary shall give priority to eligible projects that, as compared to other eligible projects, will contribute to the development of regional direct air capture hubs with larger initial capacity, greater potential for expansion, and lower levelized cost per ton of carbon dioxide removed from the atmosphere.

(vi) Employment

The Secretary shall give priority to eligible projects that are likely to create opportunities for skilled training and long-term employment to the greatest number of residents of the region.

(vii) Additional criteria

The Secretary may take into consideration other criteria that, in the judgment of the Secretary, are necessary or appropriate to carry out this subsection.

(D) Coordination

To the maximum extent practicable, in carrying out the program under this subsection, the Secretary shall take into account and coordinate with activities of the

carbon capture technology program established under section 16292(b)(1) of this title, the carbon storage validation and testing program established under section 16293(b)(1) of this title, and the CIFIA program established under section 16372(a) of this title such that funding from each of the programs is leveraged to contribute toward the development of integrated regional and inter-regional carbon capture, removal, transport, sequestration, and utilization networks.

(E) Funding of eligible projects

The Secretary may make grants to, or enter into cooperative agreements or contracts with, each eligible project selected under subparagraph (B) to accelerate commercialization of, and demonstrate the removal, processing, transport, sequestration, and utilization of, carbon dioxide captured from the atmosphere.

(4) Authorization of appropriations

There is authorized to be appropriated to the Secretary to carry out this subsection \$3,500,000,000 for the period of fiscal years 2022 through 2026, to remain available until expended.

(k) Authorization of appropriations

There are authorized to be appropriated to the Secretary to carry out this section—

(1) \$175,000,000 for fiscal year 2021, of which—

(A) \$15,000,000 shall be used to carry out subsection (e)(2)(A), to remain available until expended; and

(B) \$100,000,000 shall be used to carry out subsection (e)(2)(B), to remain available until expended;

(2) \$63,500,000 for fiscal year 2022;

(3) \$66,150,000 for fiscal year 2023;

(4) \$69,458,000 for fiscal year 2024; and

(5) \$72,930,000 for fiscal year 2025.

(Pub. L. 109–58, title IX, §969D, as added Pub. L. 116–260, div. Z, title V, §5001(a), Dec. 27, 2020, 134 Stat. 2547; amended Pub. L. 117–58, div. D, title III, §40308(a), Nov. 15, 2021, 135 Stat. 1003.)

Editorial Notes**AMENDMENTS**

2021—Subsecs. (j), (k). Pub. L. 117–58 added subsec. (j) and redesignated former subsec. (j) as (k).

Statutory Notes and Related Subsidiaries**WAGE RATE REQUIREMENTS**

For provisions relating to rates of wages to be paid to laborers and mechanics on projects for construction, alteration, or repair work funded under div. D or an amendment by div. D of Pub. L. 117–58, including authority of Secretary of Labor, see section 18851 of this title.

APPLICATION

Provisions of section 3212 of this title applicable to construction, alteration, or repair work of demonstration projects funded by grants or contracts authorized under this section, see section 9006(b) of div. Z of Pub. L. 116–260, set out as a note under section 16237 of this title.

§ 16298e. Carbon dioxide removal task force and report

(a) Definition of carbon dioxide removal

In this section, the term “carbon dioxide removal” means the capture of carbon dioxide directly from ambient air or, in dissolved form, from seawater, combined with the sequestration of that carbon dioxide, including through—

- (1) direct air capture and sequestration;
- (2) enhanced carbon mineralization;
- (3) bioenergy with carbon capture and sequestration;
- (4) forest restoration;
- (5) soil carbon management; and
- (6) direct ocean capture.

(b) Report

Not later than 180 days after December 27, 2020, the Secretary of Energy (in this section referred to as the “Secretary”), in consultation with the heads of any other relevant Federal agencies, shall prepare a report that—

- (1) estimates the magnitude of excess carbon dioxide in the atmosphere that will need to be removed by 2050 to achieve net-zero emissions and stabilize the climate;
- (2) inventories current and emerging approaches of carbon dioxide removal and evaluates the advantages and disadvantages of each of the approaches; and
- (3) identifies recommendations for legislation, funding, rules, revisions to rules, financing mechanisms, or other policy tools that the Federal Government can use to sufficiently advance the deployment of carbon dioxide removal projects in order to meet, in the aggregate, the magnitude of needed removals estimated under paragraph (1), including policy tools, such as—
 - (A) grants;
 - (B) loans or loan guarantees;
 - (C) public-private partnerships;
 - (D) direct procurement;
 - (E) incentives, including subsidized Federal financing mechanisms available to project developers;
 - (F) advance market commitments;
 - (G) regulations; and
 - (H) any other policy mechanism determined by the Secretary to be beneficial for advancing carbon dioxide removal methods and the deployment of carbon dioxide removal projects.

(c) Submission; publication

The Secretary shall—

- (1) submit the report prepared under subsection (b) to the Committee on Energy and Natural Resources of the Senate and the Committees on Energy and Commerce and Science, Space, and Technology of the House of Representatives; and
- (2) as soon as practicable after completion of the report, make the report publicly available.

(d) Evaluation; revision

(1) In general

Not later than 2 years after the date on which the Secretary publishes the report under subsection (c)(2), and every 2 years thereafter, the Secretary shall evaluate the

findings and recommendations of the report, or the most recent updated report submitted under paragraph (2)(B), as applicable, taking into consideration any issues and recommendations identified by the task force established under subsection (e)(1).

(2) Revision

After completing each evaluation under paragraph (1), the Secretary shall—

(A) revise the report as necessary; and

(B) if the Secretary revises the report under subparagraph (A), submit and publish the updated report in accordance with subsection (c).

(e) Task force

(1) Establishment and duties

Not later than 60 days after December 27, 2020, the Secretary shall establish a task force—

(A) to identify barriers to advancement of carbon dioxide removal methods and the deployment of carbon dioxide removal projects;

(B) to inventory existing or potential Federal legislation, rules, revisions to rules, financing mechanisms, or other policy tools that are capable of advancing carbon dioxide removal methods and the deployment of carbon dioxide removal projects;

(C) to assist in preparing the report described in subsection (b) and any updates to the report under subsection (d); and

(D) to advise the Secretary on matters pertaining to carbon dioxide removal.

(2) Members and selection

The Secretary shall—

(A) develop criteria for the selection of members to the task force established under paragraph (1); and

(B) select members for the task force in accordance with the criteria developed under subparagraph (A).

(3) Meetings

The task force shall meet not less frequently than once each year.

(4) Evaluation

Not later than 7 years after December 27, 2020, the Secretary shall—

(A) reevaluate the need for the task force established under paragraph (1); and

(B) submit to Congress a recommendation as to whether the task force should continue.

(Pub. L. 116-260, div. Z, title V, §5002, Dec. 27, 2020, 134 Stat. 2550.)

Editorial Notes

CODIFICATION

Section was enacted as part of the Energy Act of 2020, and not as part of the Energy Policy Act of 2005 which comprises this chapter.

PART G—SCIENCE

§ 16311. Science

(a) In general

The Secretary shall conduct, through the Office of Science, programs of research, develop-