(1) assess conflicting guidance on the economic potential of concentrating solar power for electricity production received from the National Research Council in the report entitled ''Renewable Power Pathways: A Review of the U.S. Department of Energy's Renewable Energy Programs'' and dated 2000 and subsequent reviews of that report funded by the Department; and

(2) provide an assessment of the potential impact of technology used to concentrate solar power for electricity before, or concurrent with, submission of the budget for fiscal year 2008.

(d) Report

Not later than 5 years after August 8, 2005, the Secretary shall provide to Congress a report on the economic and technical potential for electricity or hydrogen production, with or without cogeneration, with concentrating solar power, including the economic and technical feasibility of potential construction of a pilot demonstration facility suitable for commercial production of electricity or hydrogen from concentrating solar power.

(Pub. L. 109–58, title IX, § 934, Aug. 8, 2005, 119 Stat. 872.)

§ 16235. Renewable energy in public buildings

(a) Demonstration and technology transfer program

The Secretary shall establish a program for the demonstration of innovative technologies for solar and other renewable energy sources in buildings owned or operated by a State or local government, and for the dissemination of information resulting from such demonstration to interested parties.

(b) Limit on Federal funding

Notwithstanding section 16352 of this title, the Secretary shall provide under this section no more than 40 percent of the incremental costs of the solar or other renewable energy source project funded.

(c) Requirements

As part of the application for awards under this section, the Secretary shall require all applicants—

(1) to demonstrate a continuing commitment to the use of solar and other renewable energy sources in buildings they own or operate; and

(2) to state how they expect any award to further their transition to the significant use of renewable energy.

(Pub. L. 109–58, title IX, § 935, Aug. 8, 2005, 119 Stat. 873.)

§ 16236. Research and development into integrating renewable energy onto the electric grid

(a) In general

Not later than 180 days after December 27, 2020, the Secretary shall establish a research, development, and demonstration program on technologies that enable integration of renewable energy generation sources onto the electric grid across multiple program offices of the Department. The program shall include—

(1) forecasting for predicting generation from variable renewable energy sources;

(2) development of cost-effective low-loss, long-distance transmission lines; and

(3) development of cost-effective advanced technologies for variable renewable generation sources to provide grid services.

(b) Coordination

In carrying out this program, the Secretary shall coordinate across all relevant program offices at the Department to achieve the goals established in this section, including the Office of Electricity.

(c) Adoption of technologies

In carrying out this section, the Secretary shall consider barriers to adoption and commercial application of technologies that enable integration of renewable energy sources onto the electric grid, including cost and other economic barriers, and shall coordinate with relevant entities to reduce these barriers.

(Pub. L. 109–58, title IX, § 936, as added Pub. L. 116–260, div. Z, title VIII, § 8004(b), Dec. 27, 2020, 134 Stat. 2583.)

§ 16237. Wind energy research and development

(a) Definitions

In this section:

(1) Critical material

The term ''critical material'' has the meaning given the term in section 1606 of title 30.

(2) Economically distressed area

The term ''economically distressed area'' means an area described in section 3161(a) of this title.

(3) Eligible entity

The term ''eligible entity'' means—

(A) an institution of higher education, including a minority-serving institution;

(B) a National Laboratory;

(C) a Federal research agency;

(D) a State research agency;

(E) a research agency associated with a territory or freely associated state;

(F) a Tribal energy development organization;

(G) an Indian Tribe;

(H) a Tribal organization;

(I) a Native Hawaiian community-based organization;

(J) a nonprofit research organization;

(K) an industrial entity;

(L) any other entity, as determined by the Secretary; and

(M) a consortium of 2 or more entities described in subparagraphs (A) through (L).

(4) Indian Tribe

The term ''Indian Tribe'' has the meaning given the term in section 5304 of title 25.

(5) Institution of higher education

The term ''institution of higher education'' means—

(A) an institution of higher education (as defined in section 1001(a) of title 20); or

(B) a postsecondary vocational institution (as defined in section 1002(c) of title 20).

(6) Minority serving institution

The term ''minority-serving institution'' has the meaning given the term ''eligible institution'' in section 1067q(a) of title 20.

(7) National Laboratory

The term ''National Laboratory'' has the meaning given such term in section 15801(3) of this title.

(8) Native Hawaiian community-based organization

The term ''Native Hawaiian community-based organization'' has the meaning given the term in section 7517 of title 20.

(9) Program

The term ''program'' means the program established under subsection (b)(1).

(10) Secretary

The term ''Secretary'' means the Secretary of Energy.

(11) Territory or freely associated state

The term ''territory or freely associated state'' has the meaning given the term ''insular area'' in section 3103 of title 7.

(12) Tribal energy development organization

The term ''Tribal energy development organization'' has the meaning given the term ''tribal energy development organization'' in section 3501 of title 25.

(13) Tribal organization

The term ''Tribal organization'' has the meaning given the term in section 5304 of title 25.

(b) Wind energy technology program

(1) Establishment

(A) In general

The Secretary shall establish a program to conduct research, development, demonstration, and commercialization of wind energy technologies in accordance with this subsection.

(B) Purposes

The purposes of the program are the following:

(i) To improve the energy efficiency, cost effectiveness, reliability, resilience, security, siting, integration, manufacturability, installation, decommissioning, and recyclability of wind energy technologies.

(ii) To optimize the performance and operation of wind energy components, turbines, and systems, including through the development of new materials, hardware, and software.

(iii) To optimize the design and adaptability of wind energy technologies to the broadest practical range of geographic, atmospheric, offshore, and other site conditions, including—

(I) at varying hub heights; and

(II) through the use of computer modeling.

(iv) To support the integration of wind energy technologies with the electric grid and other energy technologies and systems.

(v) To reduce the cost, risk, and other potential negative impacts across the lifespan of wind energy technologies, including—

(I) manufacturing, siting, permitting, installation, operations, maintenance, decommissioning, and recycling; and

(II) through the development of solutions to transportation barriers to wind components.

(vi) To reduce and mitigate potential negative impacts of wind energy technologies on human communities, the environment, or commerce.

(vii) To address barriers to the commercialization and export of wind energy technologies.

(viii) To support the domestic wind industry, workforce, and supply chain.

(C) Targets

Not later than 180 days after December 27, 2020, the Secretary shall establish targets for the program relating to near-term (up to 2 years), mid-term (up to 7 years), and long-term (up to 15 years) challenges to the advancement of wind energy technologies, including onshore, offshore, distributed, and off-grid technologies.

(2) Activities

(A) Types of activities

In carrying out the program, the Secretary shall carry out research, development, demonstration, and commercialization activities, including—

(i) awarding grants and awards, on a competitive, merit-reviewed basis;

(ii) performing precompetitive research and development;

(iii) establishing or maintaining demonstration facilities and projects, including through stewardship of existing facilities such as the National Wind Test Center;

(iv) providing technical assistance;

(v) entering into contracts and cooperative agreements;

(vi) providing small business vouchers;

(vii) establishing prize competitions;

(viii) conducting education and outreach activities;

(ix) conducting professional development activities; and

(x) conducting analyses, studies, and reports.

(B) Subject areas

The Secretary shall carry out research, development, demonstration, and commercialization activities in the following subject areas:

(i) Wind power plant siting, performance, operations, and security.

(ii) New materials and designs relating to all hardware, software, and components of wind energy technologies, including

technologies and strategies that reduce the use of energy, water, critical materials, and other commodities that are determined to be vulnerable to disruption.

(iii) Advanced wind energy manufacturing and installation technologies and practices, including materials, processes, such as onsite or near site manufacturing, and design.

(iv) Offshore wind-specific projects and plants, including—

(I) fixed and floating substructure systems, materials, and components;

(II) the operation of offshore facilities, such as—

(aa) an offshore research facility to conduct research for oceanic, biological, geological, and atmospheric resource characterization relevant to offshore wind energy development in coordination with the ocean and atmospheric science communities; and

(bb) an offshore support structure testing facility to conduct development, demonstration, and commercialization of large-scale and full-scale offshore wind energy support structure components and systems;

(III) the monitoring and analysis of site and environmental considerations unique to offshore sites, including freshwater environments.

(v) Integration of wind energy technologies with—

(I) the electric grid, including transmission, distribution, microgrids, and distributed energy systems; and

(II) other energy technologies, including—

(aa) other generation sources;

(bb) demand response technologies; and

(cc) energy storage technologies.

(vi) Methods to improve the lifetime, maintenance, decommissioning, recycling, reuse, and sustainability of wind energy components and systems, including technologies and strategies to reduce the use of energy, water, critical materials, and other valuable or harmful inputs.

(vii) Wind power forecasting and atmospheric measurement systems, including for turbines and plant systems of varying height.

(viii) Integrated wind energy systems, grid-connected and off-grid, that incorporate diverse—

(I) generation sources;

(II) loads; and

(III) storage technologies.

(ix) Reducing market barriers, including non-hardware and information-based barriers, to the adoption of wind energy technologies, such as impacts on, or challenges relating to—

(I) distributed wind technologies, including the development of best practices, models, and voluntary streamlined processes for local siting and permitting of distributed wind energy systems to reduce costs;

(II) airspace;

(III) military operations;

(IV) radar;

(V) local communities, with special consideration given to economically distressed areas, previously disturbed lands such as landfills and former mines, and other areas disproportionately impacted by environmental pollution;

(VI) wildlife and wildlife habitats; and

(VII) any other appropriate matter, as determined by the Secretary.

(x) Technologies or strategies to avoid, minimize, and offset the potential impacts of wind energy facilities on bird species, bat species, marine wildlife, and other sensitive species and habitats.

(xi) Advanced physics-based and data analysis computational tools, in coordination with the high-performance computing programs of the Department, to more efficiently design, site, permit, manufacture, install, operate, decommission, and recycle wind energy systems.

(xii) Technologies for distributed wind, including micro, small, and medium turbines and the components of those turbines and their microgrid applications.

(xiii) Transformational technologies for harnessing wind energy.

(xiv) Other research areas that advance the purposes of the program, as determined by the Secretary.

(C) Prioritization

In carrying out activities under the program, the Secretary shall, to the maximum extent practicable, give special consideration to—

(i) projects that—

(I) are located in a geographically diverse range of eligible entities;

(II) support the development or demonstration of projects—

(aa) in economically distressed areas and areas disproportionately impacted by pollution; and

(bb) that provide the greatest potential to reduce energy costs, as well as promote accessibility and community implementation of demonstrated technologies;

(III) can be replicated in a variety of regions and climates;

(IV) include business commercialization plans that have the potential for—

(aa) domestic manufacturing and production of wind energy technologies; or

(bb) exports of wind energy technologies; and

(V) are carried out in collaboration with Tribal energy development organizations, Indian Tribes, Tribal organizations, Native Hawaiian community-based organizations, minority-serving institutions, or territories or freely associated States; and

(ii) with regards to professional development, activities that expand the number of individuals from underrepresented groups pursuing and attaining skills relevant to wind energy.

(D) Coordination

To the maximum extent practicable, the Secretary shall coordinate activities under the program with other relevant programs and capabilities of the Department and other Federal research programs.

(E) Use of funds

To the extent that funding is not otherwise available through other Federal programs or power purchase agreements, funding awarded for demonstration projects may be used for additional nontechnology costs, as determined to be appropriate by the Secretary, such as engineering or feasibility studies.

(F) Solicitation

Not less than once every two years, the Secretary shall conduct a national solicitation for applications for demonstration projects under this section.

(G) Report

(i) In general

Not later than 180 days after December 27, 2020, 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 potential for, and technical viability of, airborne wind energy systems to provide a significant source of energy in the United States.

(ii) Contents

The report under paragraph (1) shall include a summary of research, development, demonstration, and commercialization needs, including an estimate of Federal funding requirements, to further examine and validate the technical and economic viability of airborne wind energy concepts over the 10-year period beginning on December 27, 2020.

(3) Wind technician training grant program

The Secretary may award grants, on a competitive basis, to eligible entities to purchase large pieces of wind component equipment, such as nacelles, towers, and blades, for use in training wind technician students in onshore or offshore wind applications.

(4) Wind energy technology recycling research, development, and demonstration program

(A) In general

In addition to the program activities described in paragraph (2), in carrying out the program, the Secretary shall award financial assistance to eligible entities for research, development, and demonstration, and commercialization projects to create innovative and practical approaches to increase the reuse and recycling of wind energy technologies, including—

(i) by increasing the efficiency and cost effectiveness of the recovery of raw materials from wind energy technology components and systems, including enabling technologies such as inverters;

(ii) by minimizing potential environmental impacts from the recovery and disposal processes;

(iii) by advancing technologies and processes for the disassembly and recycling of wind energy devices;

(iv) by developing alternative materials, designs, manufacturing processes, and other aspects of wind energy technologies and the disassembly and resource recovery process that enable efficient, cost effective, and environmentally responsible disassembly of, and resource recovery from, wind energy technologies; and

(v) strategies to increase consumer acceptance of, and participation in, the recycling of wind energy technologies.

(B) Dissemination of results

The Secretary shall make available to the public and the relevant committees of Congress the results of the projects carried out through financial assistance awarded under subparagraph (A), including—

(i) development of best practices or training materials for use in the wind energy technology manufacturing, design, installation, decommissioning, or recycling industries;

(ii) dissemination at industry conferences;

(iii) coordination with information dissemination programs relating to recycling of electronic devices in general;

(iv) demonstration projects; and

(v) educational materials.

(C) Priority

In carrying out the activities authorized under this subsection, the Secretary shall give special consideration to projects that recover critical materials.

(D) Sensitive information

In carrying out the activities authorized under this subsection, the Secretary shall ensure proper security controls are in place to protect proprietary or sensitive information, as appropriate.

(5) Wind energy technology materials physical property database

(A) In general

Not later than September 1, 2022, the Secretary shall establish a comprehensive physical property database of materials for use in wind energy technologies, which shall identify the type, quantity, country of origin, source, significant uses, projected availability, and physical properties of materials used in wind energy technologies.

(B) Coordination

In establishing the database described in subparagraph (A), the Secretary shall coordinate and, to the extent practicable, avoid duplication with—

(i) other Department activities, including those carried out by the Office of Science;

(ii) the Director of the National Institute of Standards and Technology;

(iii) the Administrator of the Environmental Protection Agency;

(iv) the Secretary of the Interior; and

(v) relevant industry stakeholders, as determined by the Secretary.

(6) Wind energy program strategic vision

(A) In general

Not later than September 1, 2022, and every 6 years thereafter, the Secretary shall submit to Congress a report on the strategic vision, progress, goals, and targets of the program, including assessments of wind energy markets and manufacturing.

(B) Preparation

The Secretary shall coordinate the preparation of the report under subparagraph (A) with—

(i) existing peer review processes;

(ii) studies conducted by the National Laboratories; and

(iii) the multiyear program planning required under section 16358 of this title.

(7) Authorization of appropriations

There is authorized to be appropriated to the Secretary to carry out the program $125,000,000 for each of fiscal years 2021 through 2025.

(Pub. L. 116–260, div. Z, title III, § 3003, Dec. 27, 2020, 134 Stat. 2497.)

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.

Statutory Notes and Related Subsidiaries

APPLICATION

Pub. L. 116–260, div. Z, title IX, § 9006(b), Dec. 27, 2020, 134 Stat. 2600, provided that: ''The provisions of section 602 of the Public Works and Economic Development Act of 1965 (42 U.S.C. 3212) shall apply with respect to construction, alteration, or repair work of demonstration projects funded by grants or contracts authorized under sections 3001 [enacting part C of subchapter V of chapter 152 of this title], 3003 [enacting this section], 3004 [enacting section 16238 of this title], 5001 [enacting section 16298d of this title], and 8007 [enacting section 17389 of this title] and the amendments made by such sections.''

§ 16238. Solar energy research and development

(a) Definitions

In this section:

(1) Critical material

The term ''critical material'' has the meaning given the term in section 1606 of title 30.

(2) Economically distressed area

The term ''economically distressed area'' means an area described in section 3161(a) of this title.

(3) Eligible entity

The term ''eligible entity'' means—

(A) an institution of higher education, including a minority-serving institution;

(B) a National Laboratory;

(C) a Federal research agency;

(D) a State research agency;

(E) a research agency associated with a territory or freely associated state;

(F) a Tribal energy development organization;

(G) an Indian Tribe;

(H) a Tribal organization;

(I) a Native Hawaiian community-based organization;

(J) a nonprofit research organization;

(K) an industrial entity;

(L) any other entity, as determined by the Secretary; and

(M) a consortium of 2 or more entities described in subparagraphs (A) through (L).

(4) Indian Tribe

The term ''Indian Tribe'' has the meaning given the term in section 5304 of title 25.

(5) Institution of higher education

The term ''institution of higher education'' has the meaning given the term in section 1001 of title 20.

(6) Mine land

The term ''mine land'' means—

(A) land subject to titles IV and V of the Surface Mining Control and Reclamation Act of 1977 (30 U.S.C. 1231 et seq.; 30 U.S.C. 1251 et seq.); and

(B) land that has been claimed or patented subject to sections 2319 through 2344 of the Revised Statutes (commonly known as the ''Mining Law of 1872'') (30 U.S.C. 22 et seq.).

(7) Minority-serving institution

The term ''minority-serving institution'' has the meaning given the term ''eligible institution'' in section 1067q(a) of title 20.

(8) National Laboratory

The term ''National Laboratory'' has the meaning given such term in section 15801(3) of this title.

(9) Native Hawaiian community-based organization

The term ''Native Hawaiian community-based organization'' has the meaning given the term in section 7517 of title 20.

(10) Photovoltaic device

The term ''photovoltaic device'' means—

(A) a device that converts light directly into electricity through a solid-state, semiconductor process;

(B) the photovoltaic cells of a device described in subparagraph (A); and

(C) the electronic and electrical components of a device described in subparagraph (A).

(11) Program

The term ''program'' means the program established under subsection (b)(1)(A).

(12) Secretary

The term ''Secretary'' means the Secretary of Energy.