(A) research, development, and demonstration activities for—

(i) technologies, process improvements, and design optimizations that facilitate and promote critical material recycling of energy storage systems, including separation and sorting of component materials of such systems, and extraction, recovery, and reuse of critical materials from such systems;

(ii) technologies and methods that mitigate emissions and environmental impacts that arise from critical material recycling, including disposal of toxic reagents and byproducts related to critical material recycling processes;

(iii) technologies to enable extraction, recovery, and reuse of energy storage systems from electric vehicles and critical material recycling from such vehicles; and

(iv) technologies and methods to enable the safe transport, storage, and disposal of energy storage systems containing critical materials, including waste materials and components recovered during the critical material recycling process; and

(B) research on nontechnical barriers to improve the collection and critical material recycling of energy storage systems, including strategies to improve consumer education of, acceptance of, and participation in, the critical material recycling of energy storage systems.

(4) Report to Congress

Not later than 2 years after December 27, 2020, and every 3 years thereafter, the Secretary shall submit to the Committee on Science, Space, and Technology and the Committee on Energy and Commerce of the House of Representatives and the Committee on Energy and Natural Resources of the Senate a report summarizing the activities, findings, and progress of the program.

(Pub. L. 110–140, title VI, § 641, Dec. 19, 2007, 121 Stat. 1688; Pub. L. 116–260, div. Z, title III, § 3201(f), formerly § 3201(e), Dec. 27, 2020, 134 Stat. 2523, renumbered § 3201(f), Pub. L. 117–58, div. D, title III, § 40334(1), Nov. 15, 2021, 135 Stat. 1025; Pub. L. 117–58, div. D, title II, § 40208, Nov. 15, 2021, 135 Stat. 971; Pub. L. 117–286, § 4(a)(280), Dec. 27, 2022, 136 Stat. 4336.)

Editorial Notes

CODIFICATION

Section 40334(1) of Pub. L. 117–58, which directed amendment of section 3201 of the Energy Policy Act of 2020 by redesignating subsection (e) as subsection (f), was executed by making the amendment to section 3201 of div. Z of Pub. L. 116–260, known as the Energy Act of 2020, to reflect the probable intent of Congress.

AMENDMENTS

2022—Subsec. (e)(3)(B). Pub. L. 117–286 substituted ''Chapter 10 of title 5'' for ''Federal Advisory Committee Act'' in heading and ''Chapter 10 of title 5'' for ''The Federal Advisory Committee Act (5 U.S.C. App.)'' in text.

2021—Subsec. (k). Pub. L. 117–58, § 40208(1), added subsec. (k) and struck out former subsec. (k) which related to secondary applications and disposal of electric drive vehicle batteries.

Subsec. (p)(6). Pub. L. 117–58, § 40208(2), added par. (6) and struck out former par. (6) which read as follows: ''the secondary applications and disposal of electric drive vehicle batteries program under subsection (k) $5,000,000 for each of fiscal years 2009 through 2018.''

2020—Subsec. (q). Pub. L. 116–260 added subsec. (q).

Statutory Notes and Related Subsidiaries

EFFECTIVE DATE

Section effective on the date that is 1 day after Dec. 19, 2007, see section 1601 of Pub. L. 110–140, set out as a note under section 1824 of Title 2, The Congress.

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.

§ 17232. Better energy storage technology

(a) Definitions

In this section:

(1) Energy storage system

The term ''energy storage system'' means any system, equipment, facility, or technology that—

(A) is capable of absorbing or converting energy, storing the energy for a period of time, and dispatching the energy; and

(B)(i) uses mechanical, electrochemical, thermal, electrolysis, or other processes to convert and store electric energy that was generated at an earlier time for use at a later time;

(ii) uses mechanical, electrochemical, biochemical, or thermal processes to convert and store energy generated from mechanical processes that would otherwise be wasted, for delivery at a later time; or

(iii) stores energy in an electric, thermal, or gaseous state for direct use for heating or cooling at a later time in a manner that avoids the need to use electricity or other fuel sources at that later time, such as a grid-enabled water heater.

(2) Program

The term ''program'' means the Energy Storage System Research, Development, and Deployment Program established under subsection (b)(1).

(3) Secretary

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

(b) Energy Storage System Research, Development, and Deployment Program

(1) Establishment

Not later than 180 days after December 27, 2020, the Secretary shall establish a program, to be known as the Energy Storage System Research, Development, and Deployment Program.

(2) Initial program objectives

The program shall focus on research, development, and deployment of—

(A) energy storage systems, components, and materials designed to further the development of technologies—

(i) for large-scale commercial deployment;

(ii) for deployment at cost targets established by the Secretary;

(iii) for hourly and subhourly durations required to provide reliability services to the grid;

(iv) for daily durations, which have the capacity to discharge energy for a minimum of 6 hours;

(v) for weekly or monthly durations, which have the capacity to discharge energy for 10 to 100 hours, at a minimum; and

(vi) for seasonal durations, which have the capability to address seasonal variations in supply and demand;

(B) distributed energy storage technologies and applications, including building-grid integration;

(C) long-term cost, performance, and demonstration targets for different types of energy storage systems and for use in a variety of regions, including rural areas;

(D) transportation energy storage technologies and applications, including vehicle-grid integration;

(E) cost-effective systems and methods for—

(i) the sustainable and secure sourcing, reclamation, recycling, and disposal of energy storage systems, including critical minerals; and

(ii) the reuse and repurposing of energy storage system technologies;

(F) advanced control methods for energy storage systems;

(G) pumped hydroelectric energy storage systems to advance—

(i) adoption of innovative technologies, including—

(I) systems with adjustable-speed and other new pumping and generating equipment designs;

(II) modular systems;

(III) closed-loop systems, including mines and quarries; and

(IV) other innovative equipment and materials as determined by the Secretary; and

(ii) reductions of civil works costs and construction times for hydropower and pumped storage systems, including comprehensive data and systems analysis of hydropower and pumped storage construction technologies and processes in order to identify areas for whole-system efficiency gains;

(H) models and tools to demonstrate the costs and benefits of energy storage to—

(i) power and water supply systems;

(ii) electric generation portfolio optimization; and

(iii) expanded deployment of other renewable energy technologies, including in integrated energy storage systems;

(I) energy storage use cases from individual and combination technology applications, including value from various-use cases and energy storage services; and

(J) advanced manufacturing technologies that have the potential to improve United States competitiveness in energy storage manufacturing or reduce United States dependence on critical materials.

(3) Testing and validation

In coordination with 1 or more National Laboratories, the Secretary shall support the development, standardized testing, and validation of energy storage systems under the program, including test-bed and field trials, by developing testing and evaluation methodologies for—

(A) storage technologies, controls, and power electronics for energy storage systems under a variety of operating conditions;

(B) standardized and grid performance testing for energy storage systems, materials, and technologies during each stage of development;

(C) reliability, safety, degradation, and durability testing under standard and evolving duty cycles; and

(D) accelerated life testing protocols to predict estimated lifetime metrics with accuracy.

(4) Periodic evaluation of program objectives

Not less frequently than once every calendar year, the Secretary shall evaluate and, if necessary, update the program objectives to ensure that the program continues to advance energy storage systems toward widespread commercial deployment by lowering the costs and increasing the duration of energy storage resources.

(5) Energy storage strategic plan

(A) In general

The Secretary shall develop a 10-year strategic plan for the program, and update the plan, in accordance with this paragraph.

(B) Contents

The strategic plan developed under subparagraph (A) shall—

(i) be coordinated with and integrated across other relevant offices in the Department;

(ii) to the extent practicable, include metrics that can be used to evaluate storage technologies;

(iii) identify Department programs that—

(I) support the research and development activities described in paragraph (2) and the demonstration projects under subsection (c); and

(II)(aa) do not support the activities or projects described in subclause (I); but

(bb) are important to the development of energy storage systems and the mission of the Department, as determined by the Secretary;

(iv) include expected timelines for—

(I) the accomplishment of relevant objectives under current programs of the Department relating to energy storage systems; and

(II) the commencement of any new initiatives within the Department relating

to energy storage systems to accomplish those objectives; and

(v) incorporate relevant activities described in the Grid Modernization Initiative Multi-Year Program Plan.

(C) Submission to Congress

Not later than 180 days after December 27, 2020, the Secretary shall submit 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 the strategic plan developed under subparagraph (A).

(D) Updates to plan

The Secretary—

(i) shall annually review the strategic plan developed under subparagraph (A); and

(ii) may periodically revise the strategic plan as appropriate.

(6) Leveraging of resources

The program may be led by a specific office of the Department, but shall be cross-cutting in nature, so that in carrying out activities under the program, the Secretary (or a designee of the Secretary charged with leading the program) shall leverage existing Federal resources, including, at a minimum, the expertise and resources of—

(A) the Office of Electricity;

(B) the Office of Energy Efficiency and Renewable Energy, including the Water Power Technologies Office; and

(C) the Office of Science, including—

(i) the Basic Energy Sciences Program;

(ii) the Advanced Scientific Computing Research Program;

(iii) the Biological and Environmental Research Program; and

(D) the Electricity Storage Research Initiative established under section 16315 of this title.

(7) Protecting privacy and security

In carrying out this subsection, the Secretary shall identify, incorporate, and follow best practices for protecting the privacy of individuals and businesses and the respective sensitive data of the individuals and businesses, including by managing privacy risk and implementing the Fair Information Practice Principles of the Federal Trade Commission for the collection, use, disclosure, and retention of individual electric consumer information in accordance with the Office of Management and Budget Circular A–130 (or successor circulars).

(c) Energy storage demonstration projects; pilot grant program

(1) Demonstration projects

Not later than September 30, 2023, the Secretary shall, to the maximum extent practicable, enter into agreements to carry out 3 energy storage system demonstration projects, including—

(A) at least 1 energy storage system demonstration project designed to further the development of technologies described in clause (v) or (vi) of subsection (b)(2)(A); and

(B) 1 project to demonstrate second-life applications of electric vehicle batteries as aggregated energy storage installations to provide services to the electric grid, in accordance with paragraph (3).

(2) Energy storage pilot grant program

(A) Definition of eligible entity

In this paragraph, the term ''eligible entity'' means—

(i) a State energy office (as defined in section 15821(a) of this title);

(ii) an Indian Tribe (as defined in section 4103 of title 25;[1]

(iii) a Tribal organization (as defined in section 3765 of title 38);

(iv) an institution of higher education (as defined in section 1001 of title 20);

(v) an electric utility, including—

(I) an electric cooperative;

(II) a political subdivision of a State, such as a municipally owned electric utility, or any agency, authority, corporation, or instrumentality of a State political subdivision; and

(III) an investor-owned utility; and

(vi) a private energy storage company.

(B) Establishment

The Secretary shall establish a competitive grant program under which the Secretary shall award grants to eligible entities to carry out demonstration projects for pilot energy storage systems.

(C) Selection requirements

In selecting eligible entities to receive a grant under subparagraph (B), the Secretary shall, to the maximum extent practicable—

(i) ensure regional diversity among eligible entities awarded grants, including ensuring participation of eligible entities that are rural States and States with high energy costs;

(ii) ensure that grants are awarded for demonstration projects that—

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

(II) are designed to achieve 1 or more of the objectives described in subparagraph (D); and

(III) inject or withdraw energy from the bulk power system, electric distribution system, building energy system, or microgrid (grid-connected or islanded mode) where the project is located;

(iii) give consideration to proposals from eligible entities for securing energy storage through competitive procurement or contract for service; and

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

(D) Objectives

Each demonstration project carried out by a grant awarded under subparagraph (B)

[1] So in original. A closing parenthesis probably should precede the semicolon.

shall have 1 or more of the following objectives:

(i) To improve the security of critical infrastructure and emergency response systems.

(ii) To improve the reliability of transmission and distribution systems, particularly in rural areas, including high-energy cost rural areas.

(iii) To optimize transmission or distribution system operation and power quality to defer or avoid costs of replacing or upgrading electric grid infrastructure, including transformers and substations.

(iv) To supply energy at peak periods of demand on the electric grid or during periods of significant variation of electric grid supply.

(v) To reduce peak loads of homes and businesses.

(vi) To improve and advance power conversion systems.

(vii) To provide ancillary services for grid stability and management.

(viii) To integrate renewable energy resource production.

(ix) To increase the feasibility of microgrids (grid-connected or islanded mode).

(x) To enable the use of stored energy in forms other than electricity to support the natural gas system and other industrial processes.

(xi) To integrate fast charging of electric vehicles.

(xii) To improve energy efficiency.

(3) Demonstration of electric vehicle battery second-life applications for grid services

(A) In general

The Secretary shall enter into an agreement to carry out a project to demonstrate second-life applications of electric vehicle batteries as aggregated energy storage installations to provide services to the electric grid.

(B) Purposes

The purposes of the project under subparagraph (A) shall be—

(i) to demonstrate power safety and the reliability of the applications demonstrated under the program;

(ii) to demonstrate the ability of electric vehicle batteries—

(I) to provide ancillary services for grid stability and management; and

(II) to reduce the peak loads of homes and businesses;

(iii) to extend the useful life of electric vehicle batteries and the components of electric vehicle batteries prior to the collection, recycling, and reprocessing of the batteries and components; and

(iv) to increase acceptance of, and participation in, the use of second-life applications of electric vehicle batteries by utilities.

(C) Priority

In selecting a project to carry out under subparagraph (A), the Secretary shall give priority to projects in which the demonstration of the applicable second-life applications is paired with 1 or more facilities that could particularly benefit from increased resiliency and lower energy costs, such as a multi-family affordable housing facility, a senior care facility, and a community health center.

(4) Reports

Not less frequently than once every 3 years for the duration of the programs under paragraphs (1) and (2), the Secretary shall submit to Congress and make publicly available a report describing the performance of those programs.

(5) No project ownership interest

The Federal Government shall not hold any equity or other ownership interest in any energy storage system that is part of a project under this subsection unless the holding is agreed to by each participant of the project.

(d) Long-duration demonstration initiative and joint program

(1) Definitions

In this subsection:

(A) Initiative

The term ''Initiative'' means the demonstration initiative established under paragraph (2).

(B) Joint Program

The term ''Joint Program'' means the joint program established under paragraph (4).

(2) Establishment of Initiative

Not later than 180 days after December 27, 2020, the Secretary shall establish a demonstration initiative composed of demonstration projects focused on the development of long-duration energy storage technologies.

(3) Selection of projects

To the maximum extent practicable, in selecting demonstration projects to participate in the Initiative, the Secretary shall—

(A) ensure a range of technology types;

(B) ensure regional diversity among projects; and

(C) consider bulk power level, distribution power level, behind-the-meter, microgrid (gridconnected or islanded mode), and off-grid applications.

(4) Joint program

(A) Establishment

As part of the Initiative, the Secretary, in consultation with the Secretary of Defense, shall establish within the Department a joint program to carry out projects—

(i) to demonstrate promising long-duration energy storage technologies at different scales; and

(ii) to help new, innovative long-duration energy storage technologies become commercially viable.

(B) Memorandum of understanding

Not later than 200 days after December 27, 2020, the Secretary shall enter into a memo-

randum of understanding with the Secretary of Defense to administer the Joint Program.

(C) Infrastructure

In carrying out the Joint Program, the Secretary and the Secretary of Defense shall—

(i) use existing test-bed infrastructure at—

(I) Department facilities; and

(II) Department of Defense installations; and

(ii) develop new infrastructure for identified projects, if appropriate.

(D) Goals and metrics

The Secretary and the Secretary of Defense shall develop goals and metrics for technological progress under the Joint Program consistent with energy resilience and energy security policies.

(E) Selection of projects

(i) In general

To the maximum extent practicable, in selecting projects to participate in the Joint Program, the Secretary and the Secretary of Defense shall—

(I) ensure that projects are carried out under conditions that represent a variety of environments with different physical conditions and market constraints; and

(II) ensure an appropriate balance of—

(aa) larger, higher-cost projects; and

(bb) smaller, lower-cost projects.

(ii) Priority

In carrying out the Joint Program, the Secretary and the Secretary of Defense shall give priority to demonstration projects that—

(I) make available to the public project information that will accelerate deployment of long-duration energy storage technologies; and

(II) will be carried out in the field.

(e) Pumped storage hydropower wind and solar integration and system reliability initiative

(1) Definition of eligible entity

In this subsection, the term ''eligible entity'' means—

(A)(i) an electric utility, including—

(I) a political subdivision of a State, such as a municipally owned electric utility; or

(II) an instrumentality of a State composed of municipally owned electric utilities;

(ii) an electric cooperative; or

(iii) an investor-owned utility;

(B) an Indian Tribe or Tribal organization;

(C) a State energy office;

(D) an institution of higher education; and

(E) a consortium of the entities described in subparagraphs (A) through (D).

(2) Demonstration project

(A) In general

Not later than September 30, 2023, the Secretary shall, to the maximum extent practicable, enter into an agreement with an eligible entity to provide financial assistance to the eligible entity to carry out project design, transmission studies, power market assessments, and permitting for a pumped storage hydropower project to facilitate the long-duration storage of intermittent renewable electricity.

(B) Project requirements

To be eligible for financial assistance under subparagraph (A), a project shall—

(i) be designed to provide not less than 1,000 megawatts of storage capacity;

(ii) be able to provide energy and capacity for use in more than 1 organized electricity market;

(iii) be able to store electricity generated by intermittent renewable electricity projects located on Tribal land; and

(iv) have received a preliminary permit from the Federal Energy Regulatory Commission.

(C) Matching requirement

An eligible entity receiving financial assistance under subparagraph (A) shall provide matching funds equal to or greater than the amount of financial assistance provided under that subparagraph.

(3) Authorization of appropriations

There is authorized to be appropriated to carry out this subsection $2,000,000 for each of fiscal years 2022 through 2026.

(f) Omitted

(g) Coordination

To the maximum extent practicable, the Secretary shall coordinate the activities under this section (including activities conducted pursuant to the amendments made by this section) among the offices and employees of the Department, other Federal agencies, and other relevant entities—

(1) to ensure appropriate collaboration;

(2) to avoid unnecessary duplication of those activities; and

(3) to increase domestic manufacturing and production of energy storage systems, such as those within the Department and within the National Institute of Standards and Technology.

(h) Authorization of appropriations

There are authorized to be appropriated—

(1) to carry out subsection (b), $100,000,000 for each of fiscal years 2021 through 2025, to remain available until expended;

(2) to carry out subsection (c), $71,000,000 for each of fiscal years 2021 through 2025, to remain available until expended; and

(3) to carry out subsection (d), $30,000,000 for each of fiscal years 2021 through 2025, to remain available until expended.

(Pub. L. 116–260, div. Z, title III, § 3201, Dec. 27, 2020, 134 Stat. 2517; Pub. L. 117–58, div. D, title I, § 40112, title III, § 40334, Nov. 15, 2021, 135 Stat. 946, 1024.)

Editorial Notes

CODIFICATION

Section was enacted as part of the Energy Act of 2020, and not as part of the Energy Independence and Security Act of 2007 which comprises this chapter.

Section is comprised of section 3201 of div. Z of Pub. L. 116–260. Subsec. (f) of section 3201 of div. Z of Pub. L. 116–260 amended section 17231 of this title. Section 40334(1) of Pub. L. 117–58, which directed amendment of section 3201 of the Energy Policy Act of 2020 by redesignating subsections (e) through (g) as subsections (f) through (h), respectively, was executed by making the amendment to section 3201 of div. Z of Pub. L. 116–260, known as the Energy Act of 2020, to reflect the probable intent of Congress.

AMENDMENTS

2021—Subsec. (c)(1). Pub. L. 117–58, §40112(1), substituted ''including—'' for ''including'', inserted subpar. (A) designation before ''at least'', and added subpar. (B).

Subsec. (c)(3) to (5). Pub. L. 117–58, §40112(2), (3), added par. (3) and redesignated former pars. (3) and (4) as (4) and (5), respectively.

Subsecs. (e) to (h). Pub. L. 117–58, §40334, which directed amendment of section 3201 of the Energy Policy Act of 2020 by adding subsec. (e) and redesignating former subsecs. (e) to (g) as (f) to (h), respectively, was executed to this section, which is section 3201 of the Energy Act of 2020, to reflect the probable intent of Congress.

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.

§ 17233. Energy storage technology and microgrid assistance program

(a) Definitions

In this section:

(1) Eligible entity

The term ''eligible entity'' means—

(A) a rural electric cooperative;

(B) an agency, authority, or instrumentality of a State or political subdivision of a State that sells or otherwise uses electrical energy to provide electric services for customers; or

(C) a nonprofit organization working with at least 6 entities described in subparagraph (A) or (B).

(2) Energy storage technology

The term ''energy storage technology'' includes grid-enabled water heaters, building heating or cooling systems, electric vehicles, the production of hydrogen for transportation or industrial use, or other technologies that store energy.

(3) Microgrid

The term ''microgrid'' means a localized grid that operates autonomously regardless of whether the grid can operate in connection with another grid.

(4) Renewable energy source

The term ''renewable energy source'' has the meaning given the term in section 918c(a) of title 7.

(5) Rural electric cooperative

The term ''rural electric cooperative'' means an electric cooperative (as defined in section 796 of title 16) that sells electric energy to persons in rural areas.

(6) Secretary

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

(b) In general

Not later than 180 days after December 27, 2020, the Secretary shall establish a program under which the Secretary shall—

(1) provide grants to eligible entities under subsection (d);

(2) provide technical assistance to eligible entities under subsection (e); and

(3) disseminate information to eligible entities on—

(A) the activities described in subsections (d)(1) and (e); and

(B) potential and existing energy storage technology and microgrid projects.

(c) Cooperative agreement

The Secretary may enter into a cooperative agreement with an eligible entity to carry out subsection (b).

(d) Grants

(1) In general

The Secretary may award grants to eligible entities for identifying, evaluating, designing, and demonstrating energy storage technology and microgrid projects that utilize energy from renewable energy sources.

(2) Application

To be eligible to receive a grant under paragraph (1), an eligible entity shall submit to the Secretary an application at such time, in such manner, and containing such information as the Secretary may require.

(3) Use of grant

An eligible entity that receives a grant under paragraph (1)—

(A) shall use the grant—

(i) to conduct feasibility studies to assess the potential for implementation or improvement of energy storage technology or microgrid projects;

(ii) to analyze and implement strategies to overcome barriers to energy storage technology or microgrid project implementation, including financial, contracting, siting, and permitting barriers;

(iii) to conduct detailed engineering of energy storage technology or microgrid projects;

(iv) to perform a cost-benefit analysis with respect to an energy storage technology or microgrid project;

(v) to plan for both the short- and long-term inclusion of energy storage technology or microgrid projects into the future development plans of the eligible entity; or

(vi) to purchase and install necessary equipment, materials, and supplies for demonstration of emerging technologies; and