

or more members appointed by the Secretary who have sufficient experience and expertise to represent the full range of smart grid technologies and services, to represent both private and non-Federal public sector stakeholders. One member shall be appointed by the Secretary to Chair the Smart Grid Advisory Committee.

(2) Mission

The mission of the Smart Grid Advisory Committee shall be to advise the Secretary, the Assistant Secretary, and other relevant Federal officials concerning the development of smart grid technologies, the progress of a national transition to the use of smart-grid technologies and services, the evolution of widely-accepted technical and practical standards and protocols to allow interoperability and inter-communication among smart-grid capable devices, and the optimum means of using Federal incentive authority to encourage such progress.

(3) Applicability of chapter 10 of title 5

Chapter 10 of title 5 shall apply to the Smart Grid Advisory Committee.

(b) Smart Grid Task Force

(1) Establishment

The Assistant Secretary of the Office of Electricity Delivery and Energy Reliability shall establish, within 90 days of December 19, 2007, a Smart Grid Task Force composed of designated employees from the various divisions of that office who have responsibilities related to the transition to smart-grid technologies and practices. The Assistant Secretary or his designee shall be identified as the Director of the Smart Grid Task Force. The Chairman of the Federal Energy Regulatory Commission and the Director of the National Institute of Standards and Technology shall each designate at least one employee to participate on the Smart Grid Task Force. Other members may come from other agencies at the invitation of the Assistant Secretary or the nomination of the head of such other agency. The Smart Grid Task Force shall, without disrupting the work of the Divisions or Offices from which its members are drawn, provide an identifiable Federal entity to embody the Federal role in the national transition toward development and use of smart grid technologies.

(2) Mission

The mission of the Smart Grid Task Force shall be to insure awareness, coordination and integration of the diverse activities of the Office and elsewhere in the Federal Government related to smart-grid technologies and practices, including but not limited to: smart grid research and development; development of widely accepted smart-grid standards and protocols; the relationship of smart-grid technologies and practices to electric utility regulation; the relationship of smart-grid technologies and practices to infrastructure development, system reliability and security; and the relationship of smart-grid technologies and practices to other facets of electricity supply, demand, transmission, distribution,

and policy. The Smart Grid Task Force shall collaborate with the Smart Grid Advisory Committee and other Federal agencies and offices. The Smart Grid Task Force shall meet at the call of its Director as necessary to accomplish its mission.

(c) Authorization

There are authorized to be appropriated for the purposes of this section such sums as are necessary to the Secretary to support the operations of the Smart Grid Advisory Committee and Smart Grid Task Force for each of fiscal years 2008 through 2020.

(Pub. L. 110-140, title XIII, §1303, Dec. 19, 2007, 121 Stat. 1784; Pub. L. 117-286, §4(a)(281), Dec. 27, 2022, 136 Stat. 4336.)

Editorial Notes

AMENDMENTS

2022—Subsec. (a)(3). 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.

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.

§ 17384. Smart grid technology research, development, and demonstration

(a) Power grid digital information technology

The Secretary, in consultation with the Federal Energy Regulatory Commission and other appropriate agencies, electric utilities, the States, and other stakeholders, shall carry out a research, development, and demonstration program—

(1) to develop advanced techniques for measuring peak load reductions and energy-efficiency savings from smart metering, demand response, distributed generation, and electricity storage systems;

(2) to investigate means for demand response, distributed generation, and storage to provide ancillary services;

(3) to conduct research to advance the use of wide-area measurement and control networks, including data mining, visualization, advanced computing, and secure and dependable communications in a highly-distributed environment;

(4) to test new reliability technologies, including those concerning communications network capabilities, in a grid control room environment against a representative set of local outage and wide area blackout scenarios;

(5) to identify communications network capacity needed to implement advanced technologies.¹

(6) to investigate the feasibility of a transition to time-of-use and real-time electricity pricing;

(7) to develop algorithms for use in electric transmission system software applications;

(8) to promote the use of underutilized electricity generation capacity in any substi-

¹ So in original. The period probably should be a semicolon.

tution of electricity for liquid fuels in the transportation system of the United States; and

(9) in consultation with the Federal Energy Regulatory Commission, to propose interconnection protocols to enable electric utilities to access electricity stored in vehicles to help meet peak demand loads.

(b) Smart grid regional demonstration initiative

(1) In general

The Secretary shall establish a smart grid regional demonstration initiative (referred to in this subsection as the “Initiative”) composed of demonstration projects focused on cost-effective, advanced technologies for use in power grid sensing, communications, analysis, power flow control, visualization, distribution automation, industrial control systems, dynamic line rating systems, grid redesign, and the integration of distributed energy resources.

(2) Goals

The goals of the Initiative shall be—

(A) to demonstrate the potential benefits of concentrated investments in advanced grid technologies on a regional grid;

(B) to facilitate the commercial transition from the current power transmission and distribution system technologies to advanced technologies;

(C) to facilitate the integration of advanced technologies in existing electric networks to improve system performance, power flow control, and reliability;

(D) to demonstrate protocols and standards that allow for the measurement and validation of the energy savings and fossil fuel emission reductions associated with the installation and use of energy efficiency and demand response technologies and practices;

(E) to investigate differences in each region and regulatory environment regarding best practices in implementing smart grid technologies; and

(F) to encourage the commercial application of advanced distribution automation technologies that exert intelligent control over electrical grid functions at the distribution level to improve system resilience.

(3) Demonstration projects

(A) In general

In carrying out the initiative,² the Secretary shall provide financial support to smart grid demonstration projects in urban, suburban, tribal, and rural areas, including areas where electric system assets are controlled by nonprofit entities and areas where electric system assets are controlled by investor-owned utilities.

(B) Cooperation

A demonstration project under subparagraph (A) shall be carried out in cooperation with the electric utility that owns the grid facilities in the electricity control area in which the demonstration project is carried out.

(C) Federal share of cost of technology investments

The Secretary shall provide to an electric utility described in subparagraph (B) or to other parties financial assistance for use in paying an amount equal to not more than 50 percent of the cost of qualifying advanced grid technology investments made by the electric utility or other party to carry out a demonstration project.

(D) Ineligibility for grants

No person or entity participating in any demonstration project conducted under this subsection shall be eligible for grants under section 17386 of this title for otherwise qualifying investments made as part of that demonstration project.

(E) Availability of data

The Secretary shall establish and maintain a smart grid information clearinghouse in a timely manner which will make data from smart grid demonstration projects and other sources available to the public. As a condition of receiving financial assistance under this subsection, a utility or other participant in a smart grid demonstration project shall provide such information as the Secretary may require to become available through the smart grid information clearinghouse in the form and within the timeframes as directed by the Secretary. The Secretary shall assure that business proprietary information and individual customer information is not included in the information made available through the clearinghouse.

(F) Open protocols and standards

The Secretary shall require as a condition of receiving funding under this subsection that demonstration projects utilize open protocols and standards (including Internet-based protocols and standards) if available and appropriate.

(c) Authorization of appropriations

There are authorized to be appropriated—

(1) to carry out subsection (a), such sums as are necessary for each of fiscal years 2008 through 2012; and

(2) to carry out subsection (b), such sums as may be necessary.

(Pub. L. 110-140, title XIII, §1304, Dec. 19, 2007, 121 Stat. 1786; Pub. L. 111-5, div. A, title IV, §405(1)–(4), Feb. 17, 2009, 123 Stat. 143, 144; Pub. L. 116-260, div. Z, title VIII, §8001, Dec. 27, 2020, 134 Stat. 2578.)

Editorial Notes

AMENDMENTS

2020—Subsec. (a). Pub. L. 116-260, §8001(1), inserted “research, development, and demonstration” before “program” in introductory provisions.

Subsec. (b)(1). Pub. L. 116-260, §8001(2)(A), amended par. (1) generally. Prior to amendment, text read as follows: “The Secretary shall establish a smart grid regional demonstration initiative (referred to in this subsection as the ‘Initiative’) composed of demonstration projects specifically focused on advanced technologies for use in power grid sensing, communications, anal-

²So in original. Probably should be “Initiative.”

ysis, and power flow control. The Secretary shall seek to leverage existing smart grid deployments.”

Subsec. (b)(2)(F). Pub. L. 116-260, §8001(2)(B), added subpar. (F).

2009—Subsec. (b)(3)(A). Pub. L. 111-5, §405(1), amended subpar. (A) generally. Prior to amendment, text read as follows: “In carrying out the initiative, the Secretary shall carry out smart grid demonstration projects in up to 5 electricity control areas, including rural areas and at least 1 area in which the majority of generation and transmission assets are controlled by a tax-exempt entity.”

Subsec. (b)(3)(C). Pub. L. 111-5, §405(2), amended subpar. (C) generally. Prior to amendment, text read as follows: “The Secretary shall provide to an electric utility described in subparagraph (B) financial assistance for use in paying an amount equal to not more than 50 percent of the cost of qualifying advanced grid technology investments made by the electric utility to carry out a demonstration project.”

Subsec. (b)(3)(E), (F). Pub. L. 111-5, §405(3), added subpars. (E) and (F).

Subsec. (c)(2). Pub. L. 111-5, §405(4), amended par. (2) generally. Prior to amendment, par. (2) read as follows: “to carry out subsection (b), \$100,000,000 for each of fiscal years 2008 through 2012.”

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.

§ 17384a. Smart grid modeling, visualization, architecture, and controls

(a) In general

Not later than 180 days after December 27, 2020, the Secretary shall establish a program of research, development, demonstration, and commercial application on electric grid modeling, sensing, visualization, architecture development, and advanced operation and controls.

(b) Modeling research and development

The Secretary shall support development of models of emerging technologies and systems to facilitate the secure and reliable design, planning, and operation of the electric grid for use by industry stakeholders. In particular, the Secretary shall support development of—

(1) models to analyze and predict the effects of adverse physical and cyber events on the electric grid;

(2) coupled models of electrical, physical, and cyber systems;

(3) models of existing and emerging technologies being deployed on the electric grid due to projected changes in the electric generation mix and loads, for a variety of regional characteristics; and

(4) integrated models of the communications, transmission, distribution, and other interdependent systems for existing, new, and emerging technologies.

(c) Situational awareness research and development

(1) In general

The Secretary shall support development of computational tools and technologies to improve sensing, monitoring, and visualization of the electric grid for real-time situational awareness and decision support tools that en-

able improved operation of the power system, including utility, non-utility, and customer grid-connected assets, for use by industry partners.

(2) Data use

In developing visualization capabilities under this section, the Secretary shall develop tools for industry stakeholders to use to analyze data collected from advanced measurement and monitoring technologies, including data from phasor measurement units and advanced metering units.

(3) Severe events

The Secretary shall prioritize enhancing cyber and physical situational awareness of the electric grid during adverse manmade and naturally-occurring events.

(d) Operation and controls research and development

The Secretary shall conduct research to develop improvements to the operation and controls of the electric grid, in coordination with industry partners. Such activities shall include—

(1) a training facility or facilities to allow grid operators to gain operational experience with advanced grid control concepts and technologies;

(2) development of cost-effective advanced operation and control concepts and technologies, such as adaptive islanding, dynamic line rating systems, power flow controllers, network topology optimization, smart circuit breakers, intelligent load shedding, and fault-tolerant control system architectures;

(3) development of real-time control concepts using artificial intelligence and machine learning for improved electric grid resilience; and

(4) utilization of advanced data analytics including load forecasting, power flow modeling, equipment failure prediction, resource optimization, risk analysis, and decision analysis.

(e) Interoperability research and development

The Secretary shall conduct research and development on tools and technologies that improve the interoperability and compatibility of new and emerging components, technologies, and systems with existing electric grid infrastructure.

(f) Underground transmission and distribution lines

In carrying out the program under subsection (a), the Secretary shall support research and development on underground transmission and distribution lines. This shall include research on—

(1) methods for lowering the costs of underground transmission and distribution lines, including through novel installation techniques and materials considerations;

(2) techniques to improve the lifespan of underground transmission and distribution lines;

(3) wireless sensors to improve safety of underground transmission and distribution lines and to predict, identify, detect, and transmit information about degradation and faults; and

(4) methods for improving the resilience and reliability of underground transmission and