

Editorial Notes

REFERENCES IN TEXT

The Federal Advisory Committee Act, referred to in subsec. (a)(3), is Pub. L. 92-463, Oct. 6, 1972, 86 Stat. 770, which is set out in the Appendix to Title 5, Government Organization and Employees.

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 substitution 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, anal-

ysis, 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 quali-

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

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

fyng 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, analysis, 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 enable 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