To direct the Secretary of Energy to establish a program to advance energy storage deployment by reducing the cost of energy storage through research, development, and demonstration, and for other purposes.

IN THE SENATE OF THE UNITED STATES

SEPTEMBER 27, 2017

Mr. WYDEN (for himself, Mr. WHITEHOUSE, and Mr. REED) introduced the following bill; which was read twice and referred to the Committee on Energy and Natural Resources

A BILL

To direct the Secretary of Energy to establish a program to advance energy storage deployment by reducing the cost of energy storage through research, development, and demonstration, and for other purposes.

1 Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

2 SECTION 1. SHORT TITLE.

3 This Act may be cited as the “Reducing the Cost of Energy Storage Act of 2017”.

4 SEC. 2. DEFINITIONS.

5 In this Act:

6 (1) DER.—
(A) IN GENERAL.—The term “DER” means an electric device that can produce or consume energy that is located—

(i) on the distribution system or any subsystem of the distribution system; or

(ii) behind a customer meter.

(B) INCLUSIONS.—The term “DER” includes—

(i) an energy storage resource;

(ii) an energy generation technology;

(iii) a demand response resource;

(iv) an energy efficiency resource;

(v) an electric vehicle and associated supply equipment and systems; and

(vi) aggregations and integrated control systems, including virtual power plants, microgrids, and networks of microgrid cells.

(2) ELECTRIC CONSUMER; STATE REGULATORY AUTHORITY.—The terms “electric consumer” and “State regulatory authority” have the meanings given the terms in section 3 of the Public Utility Regulatory Policies Act of 1978 (16 U.S.C. 2602).

(3) ENERGY STORAGE.—The term “energy storage” means equipment or facilities capable of
absorbing energy, storing energy for a period of time, and dispatching the stored energy, that—

(A) uses mechanical, electrochemical, hydroelectric, or thermal processes, as a single facility or as an aggregation of units, throughout the electric grid, including behind the meter to store energy generated at 1 time for use at a later time;

(B) uses mechanical, electrochemical, hydroelectric, or thermal processes, as a single facility or as an aggregation of units, throughout the electric grid, including behind the meter to store energy generated from mechanical processes that would otherwise be wasted for delivery at a later time; or

(C) stores thermal energy for direct use for heating or cooling at a later time in a manner that avoids the need to use electricity at that later time.

(4) LIGHT-DUTY CONSUMER VEHICLE.—The term “light-duty consumer vehicle” has the meaning given the term “light-duty vehicle” in section 1037.801 of title 40, Code of Federal Regulations (as in effect on the date of enactment of this Act).
(5) MICROGRID.—The term “microgrid” means a localized grid that can disconnect from the traditional grid to operate autonomously and help mitigate grid disturbances to strengthen grid resilience.

(6) PROGRAM.—The term “program” means the energy storage program established under section 3(a).

(7) SECRETARY.—The term “Secretary” means the Secretary of Energy.

(8) STATE ENERGY OFFICE.—The term “State energy office” has the meaning given the term in section 124(a) of the Energy Policy Act of 2005 (42 U.S.C. 15821(a)).

(9) TRANSIT VEHICLE.—The term “transit vehicle” has the meaning given the term “bus” in section 1192.3 of title 36, Code of Federal Regulations (as in effect on the date of enactment of this Act).

SEC. 3. REDUCING THE COST OF ENERGY STORAGE.

(a) ENERGY STORAGE PROGRAM.—

(1) ESTABLISHMENT.—Not later than 1 year after the date of enactment of this Act, the Secretary shall establish a cross-cutting national program within the Department of Energy to advance energy storage deployment by reducing the cost of
energy storage through research, development, and
demonstration.

(b) GOALS.—In developing the program, the Sec-
retary shall consider the goals of—

(1)(A) reducing the full lifecycle cost and envi-
ronmental impact of energy storage technologies,
services, and applications, with an emphasis on re-
ducing costs associated with combining energy stor-
age with intermittent renewable energy generation;
and

(B) increasing the cost-competitiveness of en-
ergy storage technologies, services, and applications,
including—

(i) the costs of subsystem components, in-
stallation, and integration; and

(ii) the costs associated with the applica-
tion of energy storage technologies within inte-
grated control systems;

(2) facilitating innovation in the manner in
which energy storage systems are conceived, de-
signed, manufactured, installed, and used for various
energy services;

(3) improving the understanding of the econom-
ics and technical characteristics of new electric grid
operating principles enabled by energy storage, including by considering regional characteristics;

(4)(A) identifying the various use cases that are possible with energy storage (including individual technology applications, combination technology applications, and integrated control system applications); and

(B) quantifying, demonstrating, and maximizing—

(i) the value of energy storage in the various use cases identified under subparagraph (A); and

(ii) the energy storage services that could be provided in those various use cases—

(I) individually; and

(II) in multiple or stacked services, including the generation of multiple value streams from integrated control systems, such as microgrids;

(5) identifying, addressing, and reducing market barriers that limit energy storage adoption, including by—

(A) identifying wholesale and retail market barriers;

(B) helping to streamline processes—
(i) to reduce the time required for project completion; and

(ii) to lower interconnection costs; and

(C) facilitating increased deployment of energy storage across sectors, including facilitating—

(i) the deployment of residential, commercial, and industrial applications; and

(ii) the deployment to low-income individuals and communities;

(6) advancing and validating the safety, reliability, and performance of energy storage, including by—

(A) establishing procedures for evaluating, verifying, and reporting the performance of energy storage technologies, including the operational safety and usable life of energy storage technologies; and

(B) refining existing or developing new industry-accepted codes, standards, and testing procedures to specify desired performance parameters for energy storage services;

(7) mapping pathways for energy storage deployment that increase the reliability, efficiency, se-
curity, and resilience of the electricity system, in-
cluding by—

(A) increasing the understanding of trends
in electricity system inertia; and

(B) assessing the ability of energy storage
to provide the technical services needed for
management of electricity system inertia;

(8) optimizing energy storage deployment—

(A) to increase the deployment of variable
renewable energy-generation technology and
electric transportation; and

(B) to support the optimal use of distrib-
uted and grid scale energy resources, including
assessing the use of energy storage technologies
to manage and optimize DERs—

(i) at different levels of market pene-
tration; or

(ii) within integrated control systems
or energy management systems, at dif-
ferent scales;

(9) advancing analytical resources to employ
storage technology effectively and profitably, includ-
ing by—

(A) using existing integrated resource
planning, transmission, and distribution design
tools and other resources to build staff capacity for State regulatory authorities, State energy offices, electric utilities, balancing authorities, and Federal power marketing administrations to assist in reducing the uncertainty and risks relating to energy storage deployment;

(B) developing techniques for conducting energy storage business case analyses; and

(C) developing end-state modeling of least-cost solutions in scenarios in which—

(i) energy storage is deployed; and

(ii) 90 to 100 percent of electricity is produced by renewable generation resources;

(10) spurring an increase in the number of energy storage technologies that are manufactured cost-competitively in the United States—

(A) through public-private partnerships; and

(B) by reducing investment risk;

(11) identifying—

(A) critical and conflict materials issues relating to energy storage technologies; and

(B) innovative, low-impact, and cost-competitive methods for procuring energy storage
materials that address the conflict issues identified under subparagraph (A), including—

(i) materials recycling programs, which may also have the effect of increasing the life of batteries; and

(ii) novel methods for obtaining lithium and other minerals domestically; and

(12) enabling responsible lifecycle management of energy storage technologies through—

(A) conducting research on responsible recycling of advanced battery materials and chemistries;

(B) encouraging the sustainable design of new energy storage technologies; and

(C) investigating end-of-life and second-life applications for advanced batteries.

(c) PRIORITY.—In developing the program, the Secretary shall pay special attention to energy storage needs and opportunities that are relatively underdeveloped and potentially transformative for the electric grid.

(d) SUBPROGRAMS.—The program shall be comprised of not fewer than 4 subprograms, including—

(1) a large-scale energy storage subprogram with emphasis on large-scale energy storage systems,
(A) electrochemical storage;

(B) pumped hydroelectric storage;

(C) mechanical storage;

(D) thermal storage;

(E) compression storage; and

(F) other technologies, as determined by the Secretary;

(2) a distributed storage subprogram that focuses on distributed energy storage technologies and applications, including existing assets and infrastructure, such as electric hot water heaters and thermal storage for space heating and cooling;

(3) a transportation electrification subprogram that focuses on storage for and within electric vehicles, including—

(A) light-, medium-, and heavy-duty passenger, utility, transit, and fleet vehicles;

(B) vehicle-grid integration, including vehicle-to-grid applications and time-varying pricing signals; and

(C) charging infrastructure and related networks and systems; and

(4) a responsible battery lifecycle management subprogram that focuses on—
(A) recycling spent batteries, including all chemistries of batteries; and

(B) designing new batteries for end-of-life recycling.

(c) COST TARGET.—

(1) IN GENERAL.—The Secretary shall develop cost targets (including technology costs, installation costs, balance of services costs, and soft costs) for energy storage across all types of energy storage technology.

(2) TARGET UPDATE; SUBTARGETS.—Not later than 5 years after the date of enactment of this Act and every 5 years thereafter, the Secretary shall—

(A) increase the rigor of cost targets based on—

(i) a technology-neutral approach that considers all types of—

(I) energy storage;

(II) application and sector-specific use profiles; and

(III) energy storage deployment scenarios, including individual technologies, technology combination use profiles, and integrated control system applications;
(ii) input from a variety of stakeholders, including the stakeholders described in subsection (i);

(iii) the inclusion and use of existing infrastructure; and

(iv) the ability to optimize the integration of intermittent renewable energy generation technology and DERs; and

(B) establish cost subtargets specific to technologies and applications selected by the Secretary, taking into consideration electricity market prices and what is required to be cost-competitive in specific markets for electric grid products and services.

(3) DEFAULT TARGET.—During the period beginning on the date of enactment of this Act and ending on the date on which the Secretary first increases the rigor of cost targets under paragraph (2), the default cost targets to be achieved by the date that is 10 years after the date of enactment of this Act, shall be an 80-percent reduction in the per kilowatt hour all-in installed cost of each energy storage technology class, as determined under paragraph (4).
(4) Energy storage technology classifications.—

(A) In general.—Not later than 1 year after the date of enactment of this Act, the Secretary shall, based on input from the stakeholders described in subsection (i), establish categories of energy storage technologies for the purposes of—

(i) updating the cost targets under paragraph (2); and

(ii) assigning the default cost target under paragraph (3).

(B) Requirements.—At a minimum, the Secretary shall establish the following energy storage technology classes under subparagraph (A):

(i) Electrochemical storage.

(ii) Pumped hydroelectric storage.

(iii) Mechanical storage.

(iv) Thermal storage.

(v) Compression storage.

(f) Scoping Report.—

(1) In general.—Not later than 1 year after the date of enactment of this Act, the Secretary
shall submit to Congress a report that includes a scoping plan for the organization of the program.

(2) Preparation of Report.—In preparing the report under paragraph (1), the Secretary shall confer with, and seek advice from, public and private stakeholders, such as the stakeholders described in subsection (i).

(g) Annual Report.—The Secretary shall submit to Congress an annual report that describes the progress of the program, including—

(1) a detailed summary of—

(A) actions taken to address each goal listed in subsection (b); and

(B) the outcomes of those actions;

(2) the quantity of energy storage deployed;

(3) the administrative costs of the program;

(4) the total amount of program funds awarded, including a description, by State, of the amount of funds awarded; and

(5) a discussion of the efficacy of the program, including discussion of the metrics described in subsection (h).

(h) Metrics of Success.—The Secretary shall develop metrics for evaluating the performance of the pro-
gram and the efficacy of the program in achieving the

goals described in subsection (b).

(i) CONSULTATION.—In carrying out the activities

under this section, the Secretary shall consult with stake-

holders, including—

(1) other Federal agencies, including the Fed-

eral Energy Regulatory Commission;

(2) the National Laboratories;

(3) States;

(4) tribal governments;

(5) units of local government;

(6) electric utilities, such as investor-owned
electric utilities, publicly owned electric utilities, and
electric cooperatives;

(7) private companies, including energy tech-
nology manufacturers;

(8) third-party energy service providers;

(9) institutions of higher education; and

(10) nonprofit organizations.

(j) PERSONAL PROTECTIONS FOR SENSITIVE PER-

SONAL DATA.—

(1) PROTECTING PRIVACY AND SECURITY.—In
carrying out this section, the Secretary, the Admin-
istrator of the Energy Information Administration,
and the Secretary of Homeland Security shall iden-
tify, incorporate, and follow best practices for pro-
tecting 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 Prin-
ciples of the Federal Trade Commission for the col-
lection, use, disclosure, and retention of individual
electric consumer information in accordance with the
Office of Management and Budget Circular A–130
(or successor circulars).

(2) PERSONAL PROTECTIONS FOR SENSITIVE
PERSONAL DATA.—

   (A) IN GENERAL.—No Federal entity shall
request the creation, recording, or collection of
data identified to an individual person as a re-
sult of the program.

   (B) LAW ENFORCEMENT REQUIRE-
MENTS.—All law enforcement agencies intend-
ing to request access to data regarding elec-
tricity consumption or generation shall be re-
quired—

       (i) to produce a probable cause war-
        rant as a requirement for gaining access to
        the data; and
(ii) to publicly report on the annual number of requests by that law enforcement agency for the data.

(k) Authorization of Appropriations.—There are authorized to be appropriated to the Secretary to carry out this section—

(1) $225,000,000 for fiscal year 2018;
(2) $275,000,000 for fiscal year 2019;
(3) $325,000,000 for fiscal year 2020;
(4) $400,000,000 for fiscal years 2021 through 2024;
(5) $325,000,000 for fiscal year 2025;
(6) $275,000,000 for fiscal year 2026; and
(7) $225,000,000 for fiscal year 2027.