

116TH CONGRESS
1ST SESSION

S. 1602

To amend the United States Energy Storage Competitiveness Act of 2007 to establish a research, development, and demonstration program for grid-scale energy storage systems, and for other purposes.

IN THE SENATE OF THE UNITED STATES

MAY 22, 2019

Ms. COLLINS (for herself, Mr. HEINRICH, Ms. SMITH, Mr. GARDNER, Mr. COONS, Ms. MCSALLY, and Mr. KING) introduced the following bill; which was read twice and referred to the Committee on Energy and Natural Resources

A BILL

To amend the United States Energy Storage Competitiveness Act of 2007 to establish a research, development, and demonstration program for grid-scale energy storage systems, and for other purposes.

1 *Be it enacted by the Senate and House of Representa-*
2 *tives of the United States of America in Congress assembled,*

3 **SECTION 1. SHORT TITLE.**

4 This Act may be cited as the “Better Energy Storage
5 Technology Act” or the “BEST Act”.

1 **SEC. 2. GRID-SCALE ENERGY STORAGE SYSTEM RESEARCH,**
 2 **DEVELOPMENT, AND DEMONSTRATION PRO-**
 3 **GRAM.**

4 (a) IN GENERAL.—The United States Energy Stor-
 5 age Competitiveness Act of 2007 (42 U.S.C. 17231) is
 6 amended—

7 (1) by redesignating subsections (l) through (p)
 8 as subsections (m) through (q), respectively; and

9 (2) by inserting after subsection (k) the fol-
 10 lowing:

11 “(l) GRID-SCALE ENERGY STORAGE SYSTEM RE-
 12 SEARCH, DEVELOPMENT, AND DEMONSTRATION PRO-
 13 GRAM.—

14 “(1) DEFINITIONS.—In this subsection:

15 “(A) ENERGY STORAGE SYSTEM.—The
 16 term ‘energy storage system’ means a system,
 17 equipment, facility, or technology that—

18 “(i) is capable of absorbing energy,
 19 storing that energy for a period of time,
 20 and dispatching the stored energy; and

21 “(ii)(I) uses a mechanical, electrical,
 22 chemical, electrochemical, or thermal proc-
 23 ess to store energy that—

24 “(aa) was generated at an earlier
 25 time for use at a later time; or

1 “(bb) was generated from a me-
2 chanical process, and would otherwise
3 be wasted, for delivery at a later time;
4 or

5 “(II) stores thermal energy for direct
6 use for heating or cooling at a later time
7 in a manner that avoids the need to use
8 electricity at that later time, in the same
9 manner as the storage and use offered by
10 a grid-enabled water heater.

11 “(B) PROGRAM.—The term ‘program’
12 means the research, development, and dem-
13 onstration program established under para-
14 graph (2)(A).

15 “(2) ESTABLISHMENT.—

16 “(A) IN GENERAL.—Not later than 180
17 days after the date of enactment of the BEST
18 Act, the Secretary shall establish within the Of-
19 fice of Electricity of the Department of Energy
20 a research, development, and demonstration
21 program of grid-scale energy storage systems,
22 in accordance with this subsection.

23 “(B) GOALS, PRIORITIES, COST TAR-
24 GETS.—The Secretary shall develop goals, pri-
25 orities, and cost targets for the program.

1 “(3) STRATEGIC PLAN.—

2 “(A) IN GENERAL.—Not later than 180
3 days after the date of enactment of the BEST
4 Act, the Secretary shall submit to the Com-
5 mittee on Energy and Natural Resources of the
6 Senate and the Committee on Science, Space,
7 and Technology of the House of Representa-
8 tives a 10-year strategic plan for the program.

9 “(B) CONTENTS.—The strategic plan sub-
10 mitted under subparagraph (A) shall—

11 “(i) identify Department of Energy
12 programs that—

13 “(I) support the research and de-
14 velopment activities described in para-
15 graph (4) and the demonstration
16 projects under paragraph (6); and

17 “(II)(aa) do not support the ac-
18 tivities or projects described in sub-
19 clause (I); but

20 “(bb) are important to the devel-
21 opment of grid-scale energy storage
22 systems and the mission of the Office
23 of Electricity of the Department of
24 Energy, as determined by the Sec-
25 retary; and

1 “(ii) include expected timelines for—

2 “(I) the accomplishment of rel-
3 evant objectives under current pro-
4 grams of the Department of Energy
5 relating to grid-scale energy storage
6 systems; and

7 “(II) the commencement of any
8 new initiatives within the Department
9 of Energy relating to grid-scale energy
10 storage systems to accomplish those
11 objectives.

12 “(C) UPDATES TO PLAN.—Not less fre-
13 quently than once every 2 years, the Secretary
14 shall submit to the Committee on Energy and
15 Natural Resources of the Senate and the Com-
16 mittee on Science, Space, and Technology of
17 the House of Representatives an updated 10-
18 year strategic plan, which shall identify, and
19 provide a justification for, any major deviation
20 from a previous strategic plan submitted under
21 this paragraph.

22 “(4) RESEARCH AND DEVELOPMENT.—In car-
23 rying out the program, the Secretary shall focus re-
24 search and development activities on developing cost-
25 effective energy storage systems that—

1 “(A)(i) to balance day-scale needs, are ca-
2 pable of highly flexible power output for not
3 less than 6 hours; and

4 “(ii) have a lifetime of—

5 “(I) not less than 8,000 cycles of dis-
6 charge at full output; and

7 “(II) 20 years of operation;

8 “(B)(i) can provide power to the electric
9 grid for durations of approximately 10 to 100
10 hours; and

11 “(ii) have a lifetime of—

12 “(I) not less than 1,500 cycles of dis-
13 charge at full output; and

14 “(II) 20 years of operation; and

15 “(C) can store energy over several months
16 and address seasonal scale variations in supply
17 and demand.

18 “(5) COST TARGETS.—

19 “(A) IN GENERAL.—Cost targets developed
20 by the Secretary under paragraph (2)(B)
21 shall—

22 “(i) be for energy storage costs across
23 all types of energy storage technology; and

1 “(ii) include technology costs, installa-
2 tion costs, balance of services costs, and
3 soft costs.

4 “(B) TARGET UPDATES; SUBTARGETS.—
5 Not less frequently than once every 5 years
6 during the 10-year period beginning on the date
7 of enactment of the BEST Act, the Secretary
8 shall—

9 “(i) revise the cost targets developed
10 under paragraph (2)(B) to be more strin-
11 gent, based on—

12 “(I) a technology-neutral ap-
13 proach that considers all types of en-
14 ergy storage deployment scenarios, in-
15 cluding individual technologies, tech-
16 nology combination use profiles, and
17 integrated control system applications;

18 “(II) input from a variety of
19 stakeholders, including the stake-
20 holders described in subsection (i)(3);

21 “(III) the inclusion and use of
22 existing infrastructure; and

23 “(IV) the ability to optimize the
24 integration of intermittent renewable

1 energy generation technology and dis-
2 tributed energy resources; and

3 “(ii) establish cost subtargets for
4 technologies and applications relating to
5 the energy storage systems described in
6 paragraph (4), taking into consideration—

7 “(I) electricity market prices; and

8 “(II) the goal of being cost-com-
9 petitive in specific markets for electric
10 grid products and services.

11 “(6) DEMONSTRATION PROJECTS.—

12 “(A) IN GENERAL.—Not later than Sep-
13 tember 30, 2023, under the program, the Sec-
14 retary shall, to the maximum extent practicable,
15 enter into agreements to carry out not more
16 than 5 grid-scale energy storage system dem-
17 onstration projects.

18 “(B) OBJECTIVES.—Each demonstration
19 project carried out under subparagraph (A)
20 shall be designed to further the development of
21 the energy storage systems described in para-
22 graph (4).

23 “(C) NO PROJECT OWNERSHIP INTER-
24 EST.—The Federal Government shall not hold
25 any equity or other ownership interest in any

1 grid-scale energy storage system that is part of
2 a demonstration project under this paragraph.

3 “(7) TESTING AND VALIDATION.—The Sec-
4 retary shall accelerate the standardized testing and
5 validation of grid-scale energy storage systems under
6 the program through collaboration with one or more
7 National Laboratories (as defined in section 2 of the
8 Energy Policy Act of 2005 (42 U.S.C. 15801)), in-
9 cluding by developing testing and evaluation meth-
10 odologies for—

11 “(A) standardized grid performance testing
12 for energy storage systems, materials, and tech-
13 nologies during each stage of development, be-
14 ginning with the research stage and ending with
15 the deployment stage, including performance
16 testing with charge and discharge protocols to
17 evaluate power capability, energy output, and
18 degradation during cycling and calendar aging
19 on earliest stage commercially viable prototypes
20 (commonly less than 100 kilowatts); and

21 “(B) accelerated life testing protocols to
22 predict estimated lifetime metrics with accu-
23 racy.

24 “(8) COORDINATION.—To accelerate the devel-
25 opment of grid-scale energy storage systems under

1 the program, and pursuant to subsection (n), the
2 Secretary shall coordinate with—

3 “(A) offices within the Department of En-
4 ergy conducting energy storage research, such
5 as the Advanced Research Projects Agency–En-
6 ergy, the Office of Science, and the Office of
7 Energy Efficiency and Renewable Energy;

8 “(B) Federal agencies that are carrying
9 out initiatives to increase energy security or re-
10 liability, such as the Department of Defense,
11 the National Science Foundation, the Federal
12 Energy Regulatory Commission, and the De-
13 partment of Homeland Security;

14 “(C) program offices that aim to increase
15 domestic manufacturing and production, such
16 as the Office of Advanced Manufacturing in the
17 Department of Energy and the National Insti-
18 tute of Standards and Technology in the De-
19 partment of Commerce; and

20 “(D) members of private industry to ad-
21 vance the development of commercially viable
22 grid-scale energy storage systems.”.

23 (b) AUTHORIZATION OF APPROPRIATIONS.—The
24 United States Energy Storage Competitiveness Act of

1 2007 (42 U.S.C. 17231) is amended, in subsection (q) (as
2 redesignated by subsection (a)(1))—

3 (1) in paragraph (5), by striking “and” at the
4 end;

5 (2) in paragraph (6), by striking the period at
6 the end and inserting “; and”; and

7 (3) by adding at the end the following:

8 “(7) the research, development, and demonstra-
9 tion program of grid-scale energy storage systems
10 under subsection (l) \$60,000,000 for each of fiscal
11 years 2020 through 2024.”.

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