

Calendar No. 360

116TH CONGRESS
1ST SESSION

S. 2702

To require the Secretary of Energy to establish an integrated energy systems research, development, and demonstration program, and for other purposes.

IN THE SENATE OF THE UNITED STATES

OCTOBER 24, 2019

Mr. RISCH (for himself and Mr. MANCHIN) introduced the following bill; which was read twice and referred to the Committee on Energy and Natural Resources

DECEMBER 17, 2019

Reported by Ms. MURKOWSKI, with an amendment

[Strike out all after the enacting clause and insert the part printed in italic]

A BILL

To require the Secretary of Energy to establish an integrated energy systems research, development, and demonstration program, 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 “~~Integrated Energy Sys-~~
5 ~~tems Act of 2019~~”.

1 **SEC. 2. INTEGRATED ENERGY SYSTEMS PROGRAM.**

2 (a) DEFINITIONS.—In this section:

3 (1) PROGRAM.—The term “program” means
4 the Integrated Energy Systems Program established
5 under subsection (b)(1).

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

8 (b) ESTABLISHMENT.—

9 (1) IN GENERAL.—The Secretary shall establish
10 a program within the Office of Nuclear Energy, to
11 be known as the “Integrated Energy Systems Pro-
12 gram”—

13 (A) to maximize energy production and ef-
14 ficiency;

15 (B) to provide reliable, competitive, and
16 environmentally sustainable electricity to the
17 grid;

18 (C) to expand the use of emissions-reduc-
19 ing energy technologies into nonelectric sectors
20 to achieve dramatic reductions in environmental
21 emissions; and

22 (D) to enable the energy infrastructure of
23 the United States to support the quantity, vari-
24 ability in type, and variability in size of genera-
25 tion devices and smart load devices.

1 (2) PROGRAM ADMINISTRATION; PARTNERS.—

2 The program shall be carried out by the Office of
3 Nuclear Energy, in partnership with—

4 (A) multiple offices of the Department of
5 Energy, including—

6 (i) the Office of Energy Efficiency
7 and Renewable Energy;

8 (ii) the Office of Fossil Energy;

9 (iii) the Office of Electricity; and

10 (iv) the Office of Cybersecurity, En-
11 ergy Security, and Emergency Response;

12 (B) National Laboratories;

13 (C) institutions of higher education; and

14 (D) the private sector.

15 (3) GOALS AND MILESTONES.—The Secretary
16 shall establish goals and milestones for the program,
17 including the goals of—

18 (A) expanding emissions-reducing energy
19 technologies to the transportation and indus-
20 trial sectors by leveraging—

21 (i) the nuclear reactor fleet of the
22 United States;

23 (ii) advanced nuclear;

24 (iii) renewable energy;

- 1 (iv) carbon capture, use, and storage;
- 2 and
- 3 (v) the energy storage resources of the
- 4 United States;
- 5 (B) ensuring the competitiveness of the
- 6 United States in best value, emissions-reducing
- 7 energy development;
- 8 (C) modernizing energy infrastructure with
- 9 emissions-reducing technology to promote—
- 10 (i) grid stability;
- 11 (ii) ramping load following;
- 12 (iii) rapid start;
- 13 (iv) intermittency; and
- 14 (v) resiliency;
- 15 (D) establishing a domestic supply chain
- 16 of—
- 17 (i) nuclear reactor and appurtenant
- 18 equipment; and
- 19 (ii) advanced coolants;
- 20 (E) enhancing and accelerating domestic
- 21 manufacturing and desalination technologies
- 22 and processes by optimally using clean energy
- 23 sources; and
- 24 (F) mitigating vulnerability to—

- 1 (i) transmission congestion on the
2 power grid;
3 (ii) cyberattack;
4 (iii) physical attack; and
5 (iv) natural phenomena.

6 (c) RESEARCH GOALS.—Research goals under the
7 program shall include—

8 (1) technology innovation to further the expansion of emissions-reducing energy technologies to accommodate a modern, resilient grid system by—

11 (A) effectively leveraging multiple energy
12 sources;

13 (B) enhancing and streamlining engineering design;

15 (C) carrying out process demonstrations to optimize performance;

17 (D) addressing safety by design; and

18 (E) streamlining regulatory review;

19 (2) the most efficient use of emissions-reducing energy technologies for hydrogen production to support transportation and industrial needs;

22 (3) water processing and purification to support industrial and municipal potable and cooling water needs;
24

1 (4) conversion of carbon feedstock (such as
2 coal, biomass, natural gas, and refuse waste) to
3 higher value nonelectric commodities;

4 (5) the use of carbon dioxide in nonelectric
5 commodities;

6 (6) advanced power cycles, extraction, and pro-
7 cessing of complex hydrocarbons to produce high-
8 value chemicals;

9 (7) more effective thermal energy use, trans-
10 port, and storage;

11 (8) the demonstration of nuclear energy deliv-
12 ery for—

13 (A) the production of chemicals, metals,
14 and fuels;

15 (B) the capture, use, and storage of car-
16 bon; and

17 (C) renewable integration with an inte-
18 grated energy system; and

19 (9) the development of new analysis capabilities
20 to identify the best ways—

21 (A) to leverage multiple energy sources in
22 a given region; and

23 (B) to quantify the benefits of integrated
24 energy systems.

1 (d) GRANTS.—The Secretary may award grants
2 under the program to support the goals of the program.

3 (e) AUTHORIZATION OF APPROPRIATIONS.—There is
4 authorized to be appropriated to the Secretary to carry
5 out the program \$50,000,000 for each of fiscal years 2020
6 through 2029.

7 **SECTION 1. SHORT TITLE.**

8 *This Act may be cited as the “Integrated Energy Sys-*
9 *tems Act of 2019”.*

10 **SEC. 2. INTEGRATED ENERGY SYSTEMS PROGRAM.**

11 (a) DEFINITIONS.—*In this section:*

12 (1) PROGRAM.—*The term “program” means the*
13 *Integrated Energy Systems Program established*
14 *under subsection (b)(1).*

15 (2) SECRETARY.—*The term “Secretary” means*
16 *the Secretary of Energy.*

17 (b) ESTABLISHMENT.—

18 (1) IN GENERAL.—*The Secretary shall establish*
19 *a program, to be known as the “Integrated Energy*
20 *Systems Program”—*

21 (A) *to maximize energy production and effi-*
22 *ciency;*

23 (B) *to develop energy systems involving the*
24 *integration of nuclear energy with renewable en-*
25 *ergy, fossil energy, and energy storage; and*

1 (C) to expand the use of emissions-reducing
2 energy technologies into nonelectric sectors to
3 achieve significant reductions in environmental
4 emissions.

5 (2) *PROGRAM ADMINISTRATION; PARTNERS.*—The
6 program shall be carried out by the Undersecretary of
7 Energy, in partnership with—

8 (A) relevant offices within the Department
9 of Energy;

10 (B) National Laboratories;

11 (C) institutions of higher education; and

12 (D) the private sector.

13 (3) *GOALS AND MILESTONES.*—The Secretary
14 shall establish quantitative goals and milestones for
15 the program.

16 (c) *RESEARCH AREAS.*—Research areas under the pro-
17 gram may include—

18 (1) technology innovation to further the expan-
19 sion of emissions-reducing energy technologies to ac-
20 commodate a modern, resilient grid system by—

21 (A) effectively leveraging multiple energy
22 sources;

23 (B) enhancing and streamlining engineer-
24 ing design;

1 (C) carrying out process demonstrations to
2 optimize performance; and

3 (D) streamlining regulatory review;

4 (2) advanced power cycles, energy extraction,
5 and processing of complex hydrocarbons to produce
6 high-value chemicals;

7 (3) efficient use of emissions-reducing energy
8 technologies for hydrogen production to support trans-
9 portation and industrial needs;

10 (4) enhancement and acceleration of domestic
11 manufacturing and desalinization technologies and
12 processes by optimally using clean energy sources;

13 (5) more effective thermal energy use, transport,
14 and storage;

15 (6) the demonstration of nuclear energy delivery
16 for—

17 (A) the production of chemicals, metals, and
18 fuels;

19 (B) the capture, use, and storage of carbon;

20 (C) renewable integration with an inte-
21 grated energy system; and

22 (D) conversion of carbon feedstock, such as
23 coal, biomass, natural gas, and refuse waste, to
24 higher value nonelectric commodities;

1 (7) *the development of new analysis capabilities*
2 *to identify the best ways—*

3 (A) *to leverage multiple energy sources in a*
4 *given region; and*

5 (B) *to quantify the benefits of integrated en-*
6 *ergy systems; and*

7 (8) *any other area that, as determined by the*
8 *Secretary, meets the purpose and goals of the pro-*
9 *gram.*

10 (d) *GRANTS.—The Secretary may award grants under*
11 *the program to support the goals of the program.*

12 **SEC. 3. REPORT ON DUPLICATIVE PROGRAMS.**

13 *Not later than 1 year after the date of enactment of*
14 *this Act, and annually thereafter, the Secretary shall submit*
15 *to Congress a report identifying any program that is dupli-*
16 *cative of the program established under section 2(b)(1).*

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