

Calendar No. 261116TH CONGRESS
1ST SESSION**S. 1821****[Report No. 116-141]**

To amend the Energy Independence and Security Act of 2007 to provide for research on, and the development and deployment of, marine energy, and for other purposes.

IN THE SENATE OF THE UNITED STATES

JUNE 12, 2019

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

OCTOBER 23, 2019

Reported by Ms. MURKOWSKI, with amendments

[Omit the part struck through and insert the part printed in *italic*]

A BILL

To amend the Energy Independence and Security Act of 2007 to provide for research on, and the development and deployment of, marine energy, 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,*

1 **SECTION 1. SHORT TITLE.**

2 This Act may be cited as the “Marine Energy Re-
3 search and Development Act of 2019”.

4 **SEC. 2. PURPOSE.**

5 The purpose of this Act is to support marine energy
6 programs that—

7 (1) promote research on, and the development
8 of, increased energy generation and capacity at re-
9 duced costs;

10 (2) promote research and development activities
11 that improve environmental outcomes of marine en-
12 ergy technologies;

13 (3) provide grid stability and create new market
14 opportunities; and

15 (4) promote job creation in the energy sector.

16 **SEC. 3. DEFINITION OF MARINE ENERGY.**

17 (a) IN GENERAL.—Section 632 of the Energy Inde-
18 pendence and Security Act of 2007 (42 U.S.C. 17211) is
19 amended to read as follows:

20 **“SEC. 632. DEFINITION OF MARINE ENERGY.**

21 “In this subtitle, the term ‘marine energy’ means en-
22 ergy from—

23 “(1) waves, tides, and currents in oceans, estu-
24 aries, and tidal areas;

25 “(2) free-flowing hydrokinetic water in rivers,
26 lakes, and streams;

1 “(3) free-flowing hydrokinetic water in man-
2 made channels; and

3 “(4) differentials in ocean temperature or ocean
4 thermal energy conversion.”.

5 (b) CONFORMING EDITS.—

6 (1) The subtitle heading for subtitle C of title
7 VI of the Energy Independence and Security Act of
8 2007 (Public Law 110–440; 121 Stat. 1686) is
9 amended by striking “**and Hydrokinetic Re-**
10 **newable**”.

11 (2) Section 631 of the Energy Independence
12 and Security Act of 2007 (42 U.S.C. 17001 note;
13 121 Stat. 1686) is amended by striking “and
14 Hydrokinetic Renewable”.

15 **SEC. 4. MARINE ENERGY RESEARCH AND DEVELOPMENT.**

16 Section 633 of the Energy Independence and Security
17 Act of 2007 (42 U.S.C. 17212) is amended to read as
18 follows:

19 **“SEC. 633. MARINE ENERGY RESEARCH AND DEVELOP-**
20 **MENT.**

21 “(a) IN GENERAL.—The Secretary, acting through
22 the Director of the Water Power Technologies Office, in
23 consultation with the Secretary of the Interior, the Sec-
24 retary of Commerce, and the Federal Energy Regulatory
25 Commission, shall carry out a program to accelerate the

1 introduction of marine energy production into the United
2 States energy supply, giving priority to technologies most
3 likely to lead to commercial utilization, while fostering ac-
4 celerated research, development, demonstration, and com-
5 mercial application of technology, including programs—

6 “(1) to assist technology development on a vari-
7 ety of scales, including full-scale prototypes, to im-
8 prove the components, processes, and systems used
9 for power generation from marine energy resources;

10 “(2) to establish and expand critical testing in-
11 frastructure and facilities necessary—

12 “(A) to cost-effectively and efficiently test
13 and prove marine energy devices; and

14 “(B) to accelerate the technological readi-
15 ness and commercialization of those devices;

16 “(3) to support efforts to increase the efficiency
17 of energy conversion, lower the cost, increase the
18 use, improve the reliability, and demonstrate the ap-
19 plicability of marine energy technologies by partici-
20 pating in demonstration projects;

21 “(4) to investigate variability issues and the ef-
22 ficient and reliable integration of marine energy with
23 the utility grid;

1 “(5) to identify and study critical short- and
2 long-term needs to create a sustainable marine en-
3 ergy supply chain based in the United States;

4 “(6) to increase the reliability and survivability
5 of marine energy technologies;

6 “(7) to verify the performance, reliability, main-
7 tainability, and cost of new marine energy device de-
8 signs and system components in an operating envi-
9 ronment;

10 “(8) to consider the protection of critical infra-
11 structure, such as adequate separation between ma-
12 rine energy devices and projects and submarine tele-
13 communications cables, including consideration of
14 established industry standards;

15 “(9)(A) to coordinate the programs carried out
16 under this section with, and avoid duplication of ac-
17 tivities across, programs of the Department and
18 other applicable Federal agencies, including National
19 Laboratories; and

20 “(B) to coordinate public-private collaboration
21 in carrying out the programs under this section;

22 “(10) to identify opportunities for joint re-
23 search and development programs and the develop-
24 ment of economies of scale between—

25 “(A) marine energy technologies; and

1 “(B) other renewable energy and fossil en-
2 ergy programs, offshore oil and gas production
3 activities, and activities of the Department of
4 Defense;

5 “(11) to identify, in conjunction with the Sec-
6 retary of Commerce, acting through the Under Sec-
7 retary of Commerce for Oceans and Atmosphere,
8 and other relevant Federal agencies as appropriate,
9 the potential environmental impacts, including po-
10 tential impacts on fisheries and other marine re-
11 sources, of marine energy technologies, measures to
12 prevent adverse impacts, and technologies and other
13 means available for monitoring and determining en-
14 vironmental impacts;

15 “(12) to identify, in conjunction with the Sec-
16 retary of the Department in which the United States
17 Coast Guard is operating, acting through the Com-
18 mandant of the United States Coast Guard, the po-
19 tential navigational impacts of marine energy tech-
20 nologies and measures to prevent adverse impacts on
21 navigation; ~~and~~

22 “(13) to support in-water technology develop-
23 ment with international partners using existing co-
24 operative procedures (including memoranda of un-
25 derstanding)—

1 “(A) to allow cooperative funding and
2 other support of value to be exchanged and le-
3 veraged; and

4 “(B) to encourage international research
5 centers and international companies to partici-
6 pate in the development of marine energy tech-
7 nology in the United States and to encourage
8 United States research centers and companies
9 to participate in marine energy projects ~~abroad.~~
10 *abroad; and*

11 “(14) to assist in the development of technology
12 *necessary to support the use of marine energy—*

13 “(A) for the generation and storage of power
14 *at sea, including in applications relating to—*

15 “(i) ocean observation and navigation;

16 “(ii) underwater vehicle charging;

17 “(iii) marine aquaculture;

18 “(iv) production of marine algae; and

19 “(v) extraction of critical minerals and
20 *gasses from seawater;*

21 “(B) for the generation and storage of
22 *power to promote the resilience of coastal com-*
23 *munities, including in applications relating to—*

24 “(i) desalination;

1 “(ii) *disaster recovery and resilience;*
 2 *and*
 3 “(iii) *community microgrids in iso-*
 4 *lated power systems; and*
 5 “(C) *in any other applications, as deter-*
 6 *mined by the Secretary.*”

7 “(b) COST SHARING AND MERIT REVIEW.—The Sec-
 8 retary shall carry out the program under this section in
 9 accordance with sections 988 and 989 of the Energy Pol-
 10 icy Act of 2005 (42 U.S.C. 16352, 16353).”.

11 **SEC. 5. NATIONAL MARINE ENERGY CENTERS.**

12 Section 634 of the Energy Independence and Security
 13 Act of 2007 (42 U.S.C. 17213) is amended—

14 (1) in the section heading, by striking “**RE-**
 15 **NEWABLE ENERGY RESEARCH, DEVELOPMENT,**
 16 **AND DEMONSTRATION**” and inserting “**ENERGY**”;

17 (2) by redesignating subsection (c) as sub-
 18 section (d); and

19 (3) by striking subsections (a) and (b) and in-
 20 serting the following:

21 “(a) CENTERS.—

22 “(1) IN GENERAL.—The Secretary shall award
 23 grants to institutions of higher education for—

24 “(A) the continuation and expansion of re-
 25 search, development, and testing activities at

1 National Marine Energy Centers established as
2 of January 1, 2019; and

3 “(B) the establishment of new National
4 Marine Energy Centers.

5 “(2) CRITERIA.—In selecting locations for new
6 National Marine Energy Centers to be established
7 under paragraph (1)(B), the Secretary shall consider
8 sites that meet one of the following criteria:

9 “(A) The new Center hosts an existing ma-
10 rine energy research and development program
11 in coordination with an engineering program at
12 an institution of higher education.

13 “(B) The new Center has proven expertise
14 to support environmental and policy-related
15 issues associated with the harnessing of energy
16 in the marine environment.

17 “(C) The new Center has access to and
18 uses marine resources.

19 “(b) PURPOSES.—The National Marine Energy Cen-
20 ters shall coordinate with other National Marine Energy
21 Centers, the Department, and the National Labora-
22 tories—

23 “(1) to advance research, development, and
24 demonstration of marine energy technologies;

1 “(2) to support in-water testing and demonstra-
2 tion of marine energy technologies, including facili-
3 ties capable of testing—

4 “(A) marine energy systems of various
5 technology readiness levels and scales;

6 “(B) a variety of technologies in multiple
7 test berths at a single location; and

8 “(C) arrays of technology devices; and

9 “(3) to serve as information clearinghouses for
10 the marine energy industry by collecting and dis-
11 seminating information on best practices in all areas
12 relating to developing and managing marine energy
13 resources and energy systems.

14 “(c) COST SHARING.—The Secretary shall carry out
15 the program under this section in accordance with section
16 988(b)(4) of the Energy Policy Act of 2005 (42 U.S.C.
17 16352(b)(4)).”.

18 **SEC. 6. AUTHORIZATION OF APPROPRIATIONS.**

19 Section 636 of the Energy Independence and Security
20 Act of 2007 (42 U.S.C. 17215) is amended by striking
21 “\$50,000,000 for each of the fiscal years 2008 through
22 2012” and inserting “~~\$150,000,000~~ \$160,000,000 for each
23 of fiscal years 2020 and 2021”.

1 **SEC. 7. STUDY OF ENERGY INNOVATION IN MARINE TRANS-**
2 **PORTATION AND INFRASTRUCTURE RESIL-**
3 **IENCE.**

4 (a) *IN GENERAL.*—*The Secretary of Energy, in con-*
5 *sultation with the Secretary of Transportation and the Sec-*
6 *retary of Commerce, shall conduct a study to examine op-*
7 *portunities for research and development in advanced ma-*
8 *rine energy technologies—*

9 (1) *to support the maritime transportation sector*
10 *to enhance job creation, economic development, and*
11 *competitiveness;*

12 (2) *to support associated maritime energy infra-*
13 *structure, including infrastructure that serves ports,*
14 *to improve system resilience and disaster recovery;*
15 *and*

16 (3) *to enable scientific missions at sea and in ex-*
17 *treme environments, including the Arctic.*

18 (b) *REPORT.*—*Not later than 1 year after the date of*
19 *enactment of this Act, the Secretary of Energy shall submit*
20 *to the Committee on Energy and Natural Resources of the*
21 *Senate and the Committee on Science, Space, and Tech-*
22 *nology of the House of Representatives a report that de-*
23 *scribes the results of the study conducted under subsection*
24 *(a).*

Calendar No. 261

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