

111<sup>TH</sup> CONGRESS  
2<sup>D</sup> SESSION

**S.** \_\_\_\_\_

To require the Secretary of Energy to take actions to stimulate the emergence of an offshore wind power industry in the United States, and for other purposes.

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IN THE SENATE OF THE UNITED STATES

Mr. BROWN (for himself, Mr. CARPER, Ms. COLLINS, Ms. SNOWE, and Mr. KAUFMAN) introduced the following bill; which was read twice and referred to the Committee on \_\_\_\_\_

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**A BILL**

To require the Secretary of Energy to take actions to stimulate the emergence of an offshore wind power industry in the United States, 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 “Program for Offshore  
5 Wind Energy Research and Development Act of 2010” or  
6 the “POWERED Act of 2010”.

7       **SEC. 2. FINDINGS.**

8       Congress finds that—

1           (1) as of the date of enactment of this Act,  
2           there are no installed offshore wind power projects  
3           in the United States;

4           (2) according to the Eastern Wind Integration  
5           and Transmission Study, high penetrations of wind  
6           generation are technically feasible with the expan-  
7           sion of transmission infrastructure; and

8           (3) to generate 20 percent of the electricity  
9           generation of the United States from wind by 2030,  
10          as described in the report entitled “20 Percent Wind  
11          Energy by 2030” and prepared by the Secretary,  
12          technological advances for offshore wind power will  
13          be required to enable cost reduction and perform-  
14          ance improvement.

15 **SEC. 3. DEFINITIONS.**

16          In this Act:

17           (1) OFFSHORE WIND POWER.—The term “off-  
18           shore wind power” means the generation of elec-  
19           tricity from the deployment of wind turbines in the  
20           Great Lakes and other inland navigable waters or in  
21           coastal waters of the United States, including the  
22           territorial sea, the exclusive economic zone, and the  
23           outer Continental Shelf.

1           (2) PROGRAM.—The term “Program” means  
2           the Offshore Wind Power Research and Develop-  
3           ment Program established under section 5.

4           (3) ROADMAP.—The term “roadmap” means an  
5           integrated plan for achieving a substantial economi-  
6           cally self-supporting offshore wind power industry in  
7           the United States during the near-term period of up  
8           to 2 years, the mid-term period of up to 7 years, and  
9           long-term period of up to 10 years beginning on the  
10          date of enactment of this Act.

11          (4) SECRETARY.—The term “Secretary” means  
12          the Secretary of Energy.

13 **SEC. 4. ROADMAP TO AN OFFSHORE WIND POWER FUTURE.**

14          (a) IN GENERAL.—Not later than 120 days after the  
15          date of enactment of this Act, in accordance with sub-  
16          section (c), the Secretary shall initiate the development of  
17          a comprehensive roadmap to assist and coordinate off-  
18          shore wind power implementation efforts.

19          (b) COMPONENTS.—At a minimum, the roadmap  
20          shall include—

21                 (1) a compilation and synthesis of the previous  
22                 analyses that have been conducted in the United  
23                 States examining the potential for offshore wind  
24                 power;

1           (2)(A) an assessment of the technological ad-  
2           vances and research needed to make offshore wind  
3           power turbines more cost competitive (both in initial  
4           installation and in ongoing maintenance); and

5           (B) recommendations on Federal support to  
6           promote research and demonstration projects (in-  
7           cluding deepwater facilities) to achieve the advances;

8           (3)(A) an assessment of the various policy sup-  
9           ports that would promote the United States market-  
10          place for offshore wind power energy, taking into  
11          consideration best practices from international pro-  
12          grams, including—

13                   (i) feed-in tariff programs;

14                   (ii) grid access policies;

15                   (iii) support to improve the transmission  
16          capacity of the electrical grid to absorb power  
17          from large offshore wind energy projects;

18                   (iv) policies for streamlining project ap-  
19          proval and contractual agreements; and

20                   (v) domestic content requirements for wind  
21          farm developers; and

22          (B) recommendations on Federal and State  
23          policies that should be enacted to prudently promote  
24          offshore wind power in the United States;

1           (4)(A) an assessment of the offshore wind  
2 power permitting system (including the requirements  
3 for securing permits for both inland and coastal  
4 waters); and

5           (B) recommendations on appropriate adminis-  
6 trative and regulatory changes to encourage and  
7 streamline offshore wind power development in the  
8 United States while responsibly safeguarding the  
9 public interests and environmental considerations;

10          (5) an assessment of the resources that will be  
11 required to develop the infrastructure necessary to  
12 build offshore wind power farms, including—

13           (A)(i) an assessment of the suitability of  
14 the United States fleet for installation of off-  
15 shore wind power turbines and associated foun-  
16 dations and transmission lines; and

17           (ii) an examination of the costs and tech-  
18 nology for alternative designs of ships and  
19 barges that may need to be constructed (includ-  
20 ing potential domestic suppliers of the ships  
21 and barges);

22           (B) an assessment of dock, crane, and  
23 laydown requirements for building offshore  
24 wind power and the capabilities of United  
25 States ports relative to those requirements (in-

1 including associated costs of any necessary expan-  
2 sions); and

3 (C)(i) an assessment of specific skill-sets of  
4 personnel needed to install and maintain off-  
5 shore wind power in the United States;

6 (ii) an estimate of the required quantities  
7 of workers required to keep pace with the an-  
8 ticipated expansion of the domestic offshore  
9 wind power market; and

10 (iii) a description of training and curricula  
11 required to produce the necessary workforce;

12 (6) an assessment of—

13 (A) the manner in which winter ice flows  
14 affect offshore wind power turbine towers; and

15 (B) the necessary technology (including  
16 costs) to mitigate any potential negative im-  
17 pacts;

18 (7) an assessment of the various domestic man-  
19 ufacturing entities that can be involved in supplying  
20 offshore wind power turbines and components, in-  
21 cluding the necessary capital required to convert the  
22 existing operations of the entities to support the off-  
23 shore wind power industry;

24 (8) an assessment of—

1 (A) the energy storage requirements that  
2 may be needed to establish offshore wind instal-  
3 lations; and

4 (B) the supply chain availability of current  
5 technologies to meet the energy storage require-  
6 ments; and

7 (9) an assessment of—

8 (A) freshwater offshore wind potential; and

9 (B) deepwater offshore wind potential, in-  
10 cluding—

11 (i) designs of floating offshore wind  
12 turbine systems;

13 (ii) manufacturing and deployment lo-  
14 gistics; and

15 (iii) suitable locations for demonstra-  
16 tion projects.

17 (c) CONSULTATION REQUIREMENTS.—In carrying  
18 out subsection (b), the Secretary shall—

19 (1) in consultation with the Secretary of the In-  
20 terior, carry out subsection (b)(4); and

21 (2) in consultation with the Secretary of Com-  
22 merce, carry out subsection (b)(6).

23 (d) REPORT.—Not later than 180 days after the en-  
24 actment of this Act, the Secretary shall submit a report

1 that describes the roadmap and makes any recommenda-  
2 tions to—

3 (1) the Committee on Energy and Natural Re-  
4 sources of the Senate;

5 (2) the Committee on Environment and Public  
6 Works of the Senate;

7 (3) the Committee on Commerce, Science, and  
8 Transportation of the Senate;

9 (4) the Committee on Energy and Commerce of  
10 the House of Representatives;

11 (5) the Committee on Natural Resources of the  
12 House of Representatives; and

13 (6) the Committee on Transportation and In-  
14 frastructure of the House of Representatives.

15 **SEC. 5. OFFSHORE WIND POWER RESEARCH AND DEVELOP-**  
16 **MENT PROGRAM.**

17 (a) IN GENERAL.—Not later than 120 days after the  
18 date of enactment of this Act, in accordance with sub-  
19 section (e), the Secretary shall establish the Offshore  
20 Wind Power Research and Development Program to assist  
21 and coordinate offshore wind power analysis and offshore  
22 wind power implementation efforts consistent with the  
23 roadmap developed under section 4.

24 (b) RESEARCH, DEVELOPMENT, AND DEMONSTRA-  
25 TION CENTERS.—

1           (1) IN GENERAL.—Under the Program, in ac-  
2 cordance with paragraph (2), the Secretary shall  
3 award, on a competitive basis with an emphasis on  
4 technical merit, grants to academic institutions or  
5 industry-academic consortia to establish 2 or more  
6 national offshore wind centers.

7           (2) SELECTION.—In selecting academic institu-  
8 tions or industry-academic consortia, the Secretary  
9 shall ensure that—

10                   (A) not less than 1 national offshore wind  
11 center focuses on transitional depth and deep-  
12 water floating offshore wind energy tech-  
13 nologies; and

14                   (B) not less than 1 national offshore wind  
15 center focuses on shallow water offshore wind  
16 energy technologies.

17 (c) GRANTS.—

18           (1) IN GENERAL.—Under the Program, the  
19 Secretary shall award grants to States, academic in-  
20 stitutions, and industry-academic consortia to con-  
21 duct coordinated, cohesive offshore wind power anal-  
22 ysis, research, and development projects consistent  
23 with the roadmap developed under section 4.

24           (2) USE OF DEPARTMENT OF ENERGY INVEST-  
25 MENTS.—In carrying out paragraph (1), the Sec-

1       retary shall, to the maximum extent practicable, le-  
2       verage investments of the Department of Energy re-  
3       lating to the activities described in that paragraph.

4       (d) SCOPE OF ACTIVITIES TO BE PROPOSED.—The  
5       Secretary shall request proposals for projects under this  
6       section for carrying out 1 or more of the following activi-  
7       ties:

8               (1) Development of alternative State policies for  
9       orderly use of offshore wind power in State power  
10      planning, including State incentives for development.

11              (2) Quantitative estimation of the offshore wind  
12      power resource, including—

13                      (A) wind directions and strengths (includ-  
14      ing wind speed frequency distribution at techno-  
15      logically significant heights, analyzed with the  
16      wind speed average and turbulence intensity);

17                      (B) bathymetry;

18                      (C) waves and currents;

19                      (D) seasonal air and water temperature  
20      distributions;

21                      (E) potential ice formation in the water  
22      and on the blades;

23                      (F) marine and lacustrine geology studies;

24                      (G) the earthquake potential of the area;

1 (H) potential points for grid connection ac-  
2 cording to current and future grid power evacu-  
3 ation and wind farm power; and

4 (I) exclusion of competing uses.

5 (3) Analysis of offshore wind power to formu-  
6 late recommendations for interconnection of offshore  
7 sites to each other and to the mainland.

8 (4) Development of plans for integration of the  
9 wind resource into the electric grid, including—

10 (A) grid transmission and distribution to-  
11 pology;

12 (B) systems analysis for reliable and effi-  
13 cient large-scale wind power integration;

14 (C) multilevel automatic control manage-  
15 ment of the power system;

16 (D) voltage and frequency regulation;

17 (E) a plan to coordinate new offshore wind  
18 farms with existing classical generators;

19 (F) energy storage for managing the varia-  
20 bility in power production and load demand;  
21 and

22 (G) load demand and wind speed pre-  
23 diction.

24 (5) Analysis of the potential wildlife and eco-  
25 logical effects, which may include on-site field study

1 of possible wildlife impacts and any visual effects to  
2 adjacent communities.

3 (6) Study of infrastructure needs, academic  
4 programs at institutions of higher education, train-  
5 ing, employment, and other economic impacts of per-  
6 mitted and potential offshore wind power projects.

7 (7) Development of an advanced concept off-  
8 shore wind turbine generator that would use alter-  
9 native designs not being implemented, such as new  
10 wind turbine blade, drivetrain, and electrical gener-  
11 ator configurations.

12 (8) Optimization of the configuration of wind  
13 turbines in offshore arrays to improve overall effi-  
14 ciency.

15 (9) Development of advanced materials, manu-  
16 facturing techniques, and deployment strategies that  
17 could reduce installation and operation costs includ-  
18 ing advanced blade manufacturing activity (including  
19 automation, materials, and the assembly of large-  
20 scale components) to stimulate the development of  
21 the blade manufacturing capacity of the United  
22 States.

23 (10) Design, demonstration, and deployment of  
24 advanced foundations, anchors, moorings, and other  
25 components that reduce costs and can sustain severe

1 water and ice flow conditions for application in shal-  
2 low water, transitional depths, and deep offshore  
3 water.

4 (11) Research focused on improving the reli-  
5 ability of wind turbine subsystems and components  
6 critical to offshore locations.

7 (12) Development of floating platforms, an-  
8 chors, and mooring technologies that extend the  
9 water depth of installations that—

10 (A) increase available site locations; and

11 (B) reduce the effect of the view from the  
12 shore.

13 (13) Development of advanced control systems  
14 for offshore wind turbines, gravity and floating foun-  
15 dations, and combining hydrodynamics and aero-  
16 dynamics, including mechanical loads attenuation,  
17 high power quality, optimum reliability, and health  
18 monitoring.

19 (14) Research on the design of large blades, in-  
20 cluding efficient airfoils, de-icing systems, structural  
21 analysis, materials, and appropriate control systems  
22 for load attenuation.

23 (15) Design and development of new deploy-  
24 ment vessels that reduce the cost of installation and

1 maintenance of offshore wind turbines and sub-  
2 marine cables.

3 (16) Development of advanced power electronics  
4 and alternating current or direct current electrical  
5 systems to connect offshore wind farms to each  
6 other and the mainland electrical grid.

7 (17) Full-scale testing and establishment of ex-  
8 perimental offshore wind farms and other projects—

9 (A) to demonstrate advanced offshore wind  
10 components and systems; and

11 (B) to validate technology and performance  
12 issues relating to the components.

13 (e) CONSULTATION REQUIREMENTS.—In carrying  
14 out subsection (d), the Secretary shall—

15 (1) in consultation with the Secretary of the In-  
16 terior, carry out—

17 (A) subsection (d)(2)(G); and

18 (B) subsection (d)(5); and

19 (2) in consultation with the Secretary of Com-  
20 merce, carry out subparagraphs (A) through (F),  
21 (H), and (I) of subsection (d)(2).

22 (f) PROPOSAL REVIEW AND SELECTION CRITERIA.—  
23 The Secretary shall review applications, and rank and  
24 award proposals that—

1           (1) contain a written plan by each participating  
2 State government, academic institution, or academic-  
3 industry consortia describing the manner in which  
4 the information developed will be used for, and inte-  
5 grated into, decisions regarding offshore wind power;

6           (2) include as part of the proposal activity, the  
7 training of professionals in analysis of offshore wind  
8 power to enhance the national offshore wind power  
9 analysis capability;

10          (3) propose to carry out 1 or more of the activi-  
11 ties described in subsection (d) and provide evidence  
12 of a proven capability to carry out the activities, as  
13 demonstrated through—

14           (A) prior research, publications, patents,  
15 and advising of government and industry re-  
16 garding offshore wind power research; or

17           (B) in the absence of that experience, dem-  
18 onstrated capability in general wind power re-  
19 search or other fields that may be transferred  
20 to offshore wind power;

21          (4) have scientific merit in the fields of science,  
22 engineering, or social science required to carry out  
23 the activities described in subsection (d);

24          (5) supplement efforts carried out as of the  
25 date of enactment of this Act by the Secretary of the

1 Interior, the Secretary of Commerce, and the heads  
2 of other applicable Federal agencies to address data  
3 needs for the development of offshore wind power as  
4 identified in consultation with the heads of the appli-  
5 cable Federal agencies;

6 (6) are consistent with a preference for pro-  
7 posals that are identified in the roadmap as strongly  
8 contributing to near-term and mid-term development  
9 targets; and

10 (7) have a term of not less than 1 year and not  
11 more than 4 years.

12 (g) REPORTS.—A State, academic institution, or in-  
13 dustry-academic consortia that receives a grant under this  
14 section shall submit a report that describes the findings  
15 of the research and development conducted with the grant  
16 to—

17 (1) the Secretary;

18 (2) the Secretary of Commerce;

19 (3) the Secretary of the Interior; and

20 (4) the Chief of Engineers.

21 (h) AUTHORIZATION OF APPROPRIATIONS.—There is  
22 authorized to be appropriated to carry out this section  
23 \$75,000,000 for each of fiscal years 2011 through 2015.

1 **SEC. 6. USE OF RENEWABLE ENERGY TO COMPLY WITH**  
2 **FEDERAL RENEWABLE ELECTRICITY STAND-**  
3 **ARD.**

4 Section 610(e)(2) of the Public Utility Regulatory  
5 Policies Act of 1978 (as added by section 132 of the Amer-  
6 ican Clean Energy and Leadership Act of 2009) is amend-  
7 ed—

8 (1) in subparagraph (H), by striking “and”  
9 after the semicolon at the end;

10 (2) in subparagraph (I)(iv), by striking the pe-  
11 riod at the end and inserting “; and”; and

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

13 “(J) allow triple credits for generation of  
14 energy from offshore wind power.”.

15 **SEC. 7. AUTHORIZATION OF APPROPRIATIONS.**

16 There are authorized to be appropriated to carry out  
17 this Act such sums as are necessary.