

## Union Calendar No. 398

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

# H. R. 3609

[Report No. 116–497]

To provide for a program of wind energy research, development, and demonstration, and for other purposes.

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### IN THE HOUSE OF REPRESENTATIVES

JULY 2, 2019

Mr. TONKO (for himself, Mr. FORTENBERRY, Mr. KENNEDY, and Mr. BACON) introduced the following bill; which was referred to the Committee on Science, Space, and Technology

SEPTEMBER 8, 2020

Additional sponsors: Mr. LOWENTHAL, Mr. CISNEROS, Mr. CONNOLLY, Mr. GRIJALVA, Mr. PETERS, Ms. HAALAND, Mr. LEVIN of California, Mrs. AXNE, Mr. MCGOVERN, Ms. SHERRILL, Mr. KEATING, and Mr. McADAMS

SEPTEMBER 8, 2020

Reported with an amendment, committed to the Committee of the Whole House on the State of the Union, and ordered to be printed

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

[For text of introduced bill, see copy of bill as introduced on July 2, 2019]

# **A BILL**

To provide for a program of wind energy research, development, and demonstration, 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 “Wind Energy Research*  
5 *and Development Act of 2019”.*

6 **SEC. 2. WIND ENERGY TECHNOLOGY, RESEARCH, DEVELOP-**  
7 **MENT AND TESTING PROGRAM.**

8        *(a) IN GENERAL.—The Secretary of Energy (in this*  
9 *Act, referred to as the “Secretary”) shall carry out a pro-*  
10 *gram to conduct research, development, testing, and evalua-*  
11 *tion of wind energy technologies. In carrying out such pro-*  
12 *gram and in accordance with subsection (b), the Secretary*  
13 *shall award grants and enter into contracts and cooperative*  
14 *agreements under this section and sections 3, 4, and 5 for*  
15 *each of the following purposes:*

16            *(1) To improve the energy efficiency, reliability,*  
17 *resilience, security, and capacity of wind energy gen-*  
18 *eration.*

19            *(2) To optimize the design and control of wind*  
20 *energy systems for the broadest practical range of at-*  
21 *mospheric conditions.*

22            *(3) To reduce the cost and risk of permitting,*  
23 *construction, operation, and maintenance of wind en-*  
24 *ergy systems, including technologies to reduce envi-*

1        *ronmental and community impacts, improve grid in-*  
2        *tegration, and reduce regulatory barriers.*

3            *(4) To improve materials, engineering, and man-*  
4        *ufacturing processes for turbines, including supersized*  
5        *turbines.*

6            *(5) To optimize wind plant performance and in-*  
7        *tegration within hybrid energy systems to enhance*  
8        *cost efficiency and electric grid stability and resil-*  
9        *ience.*

10        *(b) GRANTS, CONTRACTS, AND COOPERATIVE AGREE-*  
11        *MENTS.—*

12            *(1) GRANTS.—In carrying out the program, the*  
13        *Secretary shall award grants on a competitive, merit-*  
14        *reviewed basis to eligible entities for projects that the*  
15        *Secretary determines would best achieve the goals of*  
16        *the program.*

17            *(2) CONTRACTS AND COOPERATIVE AGREE-*  
18        *MENTS.—In carrying out the program, the Secretary*  
19        *may enter into contracts and cooperative agreements*  
20        *with eligible entities and Federal agencies for projects*  
21        *that the Secretary determines would further the pur-*  
22        *poses of the program.*

23            *(3) APPLICATION.—An entity seeking funding or*  
24        *a contract or agreement under this subsection shall*  
25        *submit to the Secretary an application at such time,*

1        *in such manner, and containing such information as*  
2        *the Secretary may require.*

3        *(c) WIND ENERGY RESEARCH SUBJECT AREAS.—The*  
4        *program established under subsection (a) shall focus on the*  
5        *research, development, testing, and evaluation of each of the*  
6        *following subject areas:*

7                *(1) Wind power plant performance and oper-*  
8                *ations including—*

9                        *(A) wind flows and turbine-to-turbine inter-*  
10                       *actions;*

11                       *(B) energy conversion potential;*

12                       *(C) turbine and wind plant control para-*  
13                       *digms;*

14                       *(D) turbine and wind plant security;*

15                       *(E) turbine components; and*

16                       *(F) integrated hybrid plant systems.*

17                *(2) New materials and designs related to blades,*  
18                *rotors, towers and drivetrains including—*

19                       *(A) higher tip speed rotor designs;*

20                       *(B) low noise rotor designs;*

21                       *(C) advanced drivetrain and generator con-*  
22                       *cepts;*

23                       *(D) modular construction and onsite or*  
24                       *near-site manufacturing and assembly tech-*  
25                       *niques;*

1           (E) sustainable and recyclable materials  
2           and manufacturing systems;

3           (F) oversized turbine design and installa-  
4           tion approaches; and

5           (G) lightweight materials.

6           (3) Offshore wind-specific projects including—

7           (A) fixed and floating substructure concepts;

8           (B) projects to assess and mitigate the im-  
9           pacts of hurricane wind flow, freshwater ice, and  
10          other United States-specific conditions;

11          (C) innovative operations and maintenance  
12          strategies;

13          (D) analysis of offshore meteorological, geo-  
14          logical, and oceanographic data collection;

15          (E) offshore infrastructure monitoring; and

16          (F) analysis of corrosion and fatigue for the  
17          purpose of extending the design life of offshore  
18          wind turbine substructures.

19          (4) Recycling and reuse of wind energy compo-  
20          nents.

21          (5) Wind power forecasting and atmospheric  
22          measurement systems, including for turbines and  
23          plant systems of varying height.

24          (6) Distributed wind-specific projects, includ-  
25          ing—

1                   (A) *cost-effective turbine designs, compo-*  
2                   *nents, and manufacturing; and*

3                   (B) *microgrid applications.*

4                   (7) *Advanced transportation mechanisms for*  
5                   *wind turbine components.*

6                   (8) *Transformational technologies for harnessing*  
7                   *wind energy, including airborne wind energy con-*  
8                   *cepts.*

9                   (9) *Methods to extend the operational lifetime of*  
10                  *onshore and offshore wind turbines and systems.*

11                  (10) *Storage technologies to address the tran-*  
12                  *sience and intermittency of wind energy resources.*

13                  (11) *Other research areas as determined by the*  
14                  *Secretary.*

15                  (d) *REPORT.—*

16                   (1) *IN GENERAL.—Not later than 180 days after*  
17                   *the date of the enactment of this Act, the Secretary*  
18                   *shall submit to the Committee on Science, Space, and*  
19                   *Technology of the House of Representatives and the*  
20                   *Committee on Energy and Natural Resources of the*  
21                   *Senate a report on the potential for, and technical vi-*  
22                   *ability of, airborne wind energy systems to provide a*  
23                   *significant source of energy in the United States.*

24                   (2) *CONTENTS.—The report under paragraph (1)*  
25                   *shall include a summary of research, development,*

1        *and demonstration needs, including an estimate of*  
2        *Federal funding requirements, to further examine and*  
3        *validate the technical and economic viability of air-*  
4        *borne wind energy concepts over the 10-year period*  
5        *beginning on the date of the enactment of this Act.*

6        *(e) COORDINATION.—To the maximum extent prac-*  
7        *ticable, the Secretary shall coordinate activities under the*  
8        *program established under subsection (a) with other rel-*  
9        *evant programs and capabilities of the Department of En-*  
10       *ergy and other Federal research programs.*

11       *(f) CONFORMING REPEALS.—*

12                *(1) Section 931(a)(2) of the Energy Policy Act*  
13        *of 2005 (42 U.S.C. 16231(a)(2)) is amended by strik-*  
14        *ing subparagraph (B).*

15                *(2) Section 4(a) of the Renewable Energy and*  
16        *Energy Efficiency Technology Competitiveness Act of*  
17        *1989 (42 U.S.C. 12003(a)) is amended by striking*  
18        *paragraph (1).*

19        *(g) DEFINITIONS.—In this section:*

20                *(1) The term “eligible entity” means any of the*  
21        *following entities:*

22                        *(A) An institution of higher education.*

23                        *(B) A National Laboratory.*

24                        *(C) A Federal research agency.*

25                        *(D) A State research agency.*



1                   (E) A nonprofit research organization.

2                   (F) An industrial entity or a multi-institu-  
3                   tional consortium thereof.

4                   (2) The term “institution of higher education”  
5                   has the meaning given such term in section 101 of the  
6                   Higher Education Act of 1965 (20 U.S.C. 1001).

7                   (3) The term “National Laboratory” has the  
8                   meaning given such term in section 2(3) of the En-  
9                   ergy Policy Act of 2005 (42 U.S.C. 15801(3)).

10                  (4) The term “supersized turbine” means a 12  
11                  megawatt or greater wind turbine, typically with a  
12                  tower height greater than 140 meters and blades  
13                  greater than 75 meters.

14 **SEC. 3. WIND ENERGY TECHNOLOGY VALIDATION AND MAR-**  
15 **KET TRANSFORMATION PROGRAM.**

16                  (a) *IN GENERAL.*—In carrying out the program estab-  
17                  lished under section 2(a), the Secretary shall conduct a  
18                  wind energy technology validation and market trans-  
19                  formation program under which the Secretary shall award  
20                  grants on a competitive, merit-reviewed basis to eligible en-  
21                  tities to support activities that demonstrate and validate  
22                  new wind energy technologies with the potential to be cost-  
23                  competitive for land-based, offshore, and distributed appli-  
24                  cations.

1       (b) *APPLICATION.*—*An eligible entity seeking a grant*  
2 *under this section shall submit an application in such form*  
3 *and manner as the Secretary may prescribe and that con-*  
4 *tains—*

5           (1) *a certification that any demonstration*  
6 *project carried out using grant funds are—*

7           (A) *conducted in collaboration with indus-*  
8 *try and, as appropriate, with institutions of*  
9 *higher education and other Federal research pro-*  
10 *grams; and*

11           (B) *of sufficient size and geographic diver-*  
12 *sity to measure wind energy system performance*  
13 *under the full productive range of wind condi-*  
14 *tions in the United States; and*

15           (2) *such other information as the Secretary may*  
16 *require.*

17       (c) *FACILITY FOR HYBRID ENERGY SYSTEM RE-*  
18 *SEARCH AND DEMONSTRATION PROJECTS.*—*In carrying*  
19 *out the program established under subsection (a), the Sec-*  
20 *retary shall establish or support a facility to conduct re-*  
21 *search and demonstration projects for wind turbines and*  
22 *plants in hybrid energy systems that incorporate diverse*  
23 *generation sources, loads, and storage technologies.*

24       (d) *OFFSHORE RESEARCH FACILITY.*—*In carrying out*  
25 *the program established under subsection (a), the Secretary*

1 *shall establish a facility to conduct research, development,*  
2 *and demonstration projects for ocean and atmospheric re-*  
3 *source characterization relevant to offshore wind energy de-*  
4 *velopment in coordination with the ocean and atmospheric*  
5 *science communities. The facility shall be an offshore area*  
6 *used to evaluate, test, and advance atmospheric, oceanic,*  
7 *biologic, and geologic monitoring technologies that improve*  
8 *offshore wind energy development, including the generation*  
9 *of benchmark data sets for testing offshore wind energy tech-*  
10 *nologies and informing how such technologies can be fi-*  
11 *nanced, insured, and regulated.*

12       (e) *OFFSHORE SUPPORT STRUCTURE TESTING FACIL-*  
13 *ITY.—In carrying out the program established under sub-*  
14 *section (a), the Secretary shall create a facility to conduct*  
15 *research, development, and demonstration projects for large-*  
16 *scale and full-scale offshore wind energy support structure*  
17 *components and systems.*

18 **SEC. 4. WIND ENERGY INCUBATOR FUNDING.**

19       *In carrying out the program established under section*  
20 *2(a), the Secretary shall conduct research, development,*  
21 *testing, and evaluation activities, in accordance with sec-*  
22 *tion 2(b), to support innovative technologies that are not*  
23 *represented in a significant way in—*

1           (1) *the portfolio of wind energy research activi-*  
2           *ties carried out by the Department of Energy as of*  
3           *the date of the enactment of this Act; or*

4           (2) *technology roadmaps used by the Department*  
5           *of Energy as of such date of enactment.*

6 **SEC. 5. MITIGATING REGULATORY AND MARKET BARRIERS.**

7           (a) *IN GENERAL.*—*In carrying out the program estab-*  
8           *lished under section 2(a), the Secretary shall research, de-*  
9           *velop, test, and evaluate, in accordance with section 2(b),*  
10          *ways to reduce regulatory and market barriers to the wide-*  
11          *spread adoption of wind power, including—*

12           (1) *grid transmission and integration challenges;*  
13          *and*

14           (2) *permitting issues associated with the poten-*  
15          *tial impacts of wind power systems on wildlife, radar*  
16          *systems, local communities, military operations, and*  
17          *airspace.*

18          (b) *WILDLIFE IMPACT MITIGATION.*—*In carrying out*  
19          *the activities described in subsection (a), the Secretary shall*  
20          *support the development, testing, and evaluation of wildlife*  
21          *impact mitigation technologies or strategies to reduce the*  
22          *potential impacts of wind energy facilities on—*

23           (1) *bald and golden eagles;*

24           (2) *bat species;*

25           (3) *marine wildlife; and*

1           (4) *other impacted species.*

2           (c) *EDUCATION AND OUTREACH.—In carrying out the*  
3 *activities described in subsection (a), the Secretary shall*  
4 *support education and outreach activities to disseminate*  
5 *information and promote public understanding of wind*  
6 *technologies and the wind energy workforce, including the*  
7 *Collegiate Wind Competition.*

8 **SEC. 6. AUTHORIZATION OF APPROPRIATIONS.**

9           *There are authorized to be appropriated to the Sec-*  
10 *retary to carry out this Act—*

11           (1) *\$103,692,000 for fiscal year 2020;*

12           (2) *\$108,876,600 for fiscal year 2021;*

13           (3) *\$114,320,430 for fiscal year 2022;*

14           (4) *\$120,036,452 for fiscal year 2023; and*

15           (5) *\$126,038,274 for fiscal year 2024.*

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

**H. R. 3609**

[Report No. 116-497]

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## **A BILL**

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SEPTEMBER 8, 2020

Reported with an amendment, committed to the Committee of the Whole House on the State of the Union, and ordered to be printed