

111TH CONGRESS
1ST SESSION

S. 2900

To establish a research, development, and technology demonstration program to improve the efficiency of gas turbines used in combined cycle and simple cycle power generation systems.

IN THE SENATE OF THE UNITED STATES

DECEMBER 17, 2009

Mrs. GILLIBRAND introduced the following bill; which was read twice and referred to the Committee on Energy and Natural Resources

A BILL

To establish a research, development, and technology demonstration program to improve the efficiency of gas turbines used in combined cycle and simple cycle power generation systems.

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 “Gas Turbine Efficiency
5 Act of 2009”.

6 **SEC. 2. HIGH EFFICIENCY GAS TURBINES.**

7 (a) IN GENERAL.—The Secretary of Energy (referred
8 to in this section as the “Secretary”) shall carry out a

1 multiyear, multiphase program of research, development,
2 and technology demonstration—

3 (1) to improve the efficiency of gas turbines
4 used in power generation systems; and

5 (2) to identify the technologies that ultimately
6 will lead to gas turbine combined cycle efficiency of
7 65 percent or simple cycle efficiency of 50 percent.

8 (b) PROGRAM ELEMENTS.—The program under this
9 section shall—

10 (1) support first-of-a-kind engineering and de-
11 tailed gas turbine design for megawatt-scale and
12 utility-scale electric power generation, including—

13 (A) high temperature materials, including
14 superalloys, coatings, and ceramics;

15 (B) improved heat transfer capability;

16 (C) manufacturing technology required to
17 construct complex 3-dimensional geometry parts
18 with improved aerodynamic capability;

19 (D) combustion technology to produce
20 higher firing temperature while lowering nitro-
21 gen oxide and carbon monoxide emissions per
22 unit of output;

23 (E) advanced controls and systems integra-
24 tion;

1 (F) advanced high performance compressor
2 technology; and

3 (G) validation facilities for the testing of
4 components and subsystems;

5 (2) include technology demonstration through
6 component testing, subscale testing, and full-scale
7 testing in existing fleets;

8 (3) include field demonstrations of the devel-
9 oped technology elements so as to demonstrate tech-
10 nical and economic feasibility; and

11 (4) assess overall combined cycle and simple
12 cycle system performance.

13 (c) PROGRAM GOALS.—The goals of the multiphase
14 program established under subsection (a) shall be—

15 (1) in phase I—

16 (A) to develop the conceptual design of ad-
17 vanced high efficiency gas turbines that can
18 achieve at least 62 percent combined cycle effi-
19 ciency or 47 percent simple cycle efficiency on
20 a lower heating value basis; and

21 (B) to develop and demonstrate the tech-
22 nology required for advanced high efficiency gas
23 turbines that can achieve at least 62 percent
24 combined cycle efficiency or 47 percent simple

1 cycle efficiency on a lower heating value basis;
2 and

3 (2) in phase II, to develop the conceptual de-
4 sign for advanced high efficiency gas turbines that
5 can achieve at least 65 percent combined cycle effi-
6 ciency or 50 percent simple cycle efficiency on a
7 lower heating value basis.

8 (d) PROPOSALS.—

9 (1) IN GENERAL.—Not later than 180 days
10 after the date of enactment of this Act, the Sec-
11 retary shall solicit grant and contract proposals from
12 industry, small businesses, institutions of higher
13 education, and other appropriate parties for con-
14 ducting activities under this section.

15 (2) SELECTION.—In selecting proposals, the
16 Secretary shall emphasize the extent to which a pro-
17 posal will—

18 (A) stimulate the creation or increased re-
19 tention of jobs in the United States; and

20 (B) promote and enhance United States
21 technology leadership.

22 (e) COMPETITIVE AWARDS.—Awards of financial as-
23 sistance under this section shall be made on a competitive
24 basis with an emphasis on technical merit.

1 (f) COST SHARING.—Section 988 of the Energy Pol-
2 icy Act of 2005 (42 U.S.C. 16352) shall apply to an award
3 of financial assistance under this section.

4 (g) LIMITS ON PARTICIPATION.—The limits on par-
5 ticipation applicable under section 999E of the Energy
6 Policy Act of 2005 (42 U.S.C. 16375) shall apply to
7 awards of financial assistance under this section.

8 (h) AUTHORIZATION OF APPROPRIATIONS.—There is
9 authorized to be appropriated to the Secretary to carry
10 out this section \$85,000,000 for each of fiscal years 2011
11 through 2014.

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