

111TH CONGRESS
2^D SESSION

S. 3619

To amend the Energy Independence and Security Act of 2007 to improve geothermal energy technology and demonstrate the use of geothermal energy in large scale thermal applications, and for other purposes.

IN THE SENATE OF THE UNITED STATES

JULY 20, 2010

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

A BILL

To amend the Energy Independence and Security Act of 2007 to improve geothermal energy technology and demonstrate the use of geothermal energy in large scale thermal applications, 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. LARGE-SCALE GEOTHERMAL ENERGY.**

4 Title VI of the Energy Independence and Security
5 Act of 2007 is amended by inserting after section 616 (42
6 U.S.C. 17195) the following:

7 **“SEC. 616A. LARGE-SCALE GEOTHERMAL ENERGY.**

8 “(a) FINDINGS.—Congress finds that—

1 “(1) the Geothermal Technologies Program of
2 the Office of Energy Efficiency and Renewable En-
3 ergy of the Department has included a focus on di-
4 rect use of geothermal energy in the low-temperature
5 geothermal energy subprogram (including in the de-
6 velopment of a research and development plan for
7 the program);

8 “(2) the Building Technologies Program of the
9 Office of Energy Efficiency and Renewable Energy
10 of the Department—

11 “(A) is focused on the energy demand and
12 energy efficiency of buildings; and

13 “(B) includes geothermal heat pumps as a
14 component technology in the residential and
15 commercial deployment activities of the pro-
16 gram; and

17 “(3) geothermal heat pumps and direct use of
18 geothermal energy, especially in large-scale applica-
19 tions, can make a significant contribution to the use
20 of renewable energy but are underrepresented in re-
21 search, development, demonstration, and commer-
22 cialization.

23 “(b) PURPOSES.—The purposes of this section are—

1 “(1) to improve the components, processes, and
2 systems used for geothermal heat pumps and the di-
3 rect use of geothermal energy; and

4 “(2) to increase the energy efficiency, lower the
5 cost, increase the use, and improve and demonstrate
6 the applicability of geothermal heat pumps to, and
7 the direct use of geothermal energy in, large build-
8 ings, commercial districts, residential communities,
9 and large municipal, agricultural, or industrial
10 projects.

11 “(c) DEFINITIONS.—In this section:

12 “(1) DIRECT USE OF GEOTHERMAL ENERGY.—
13 The term ‘direct use of geothermal energy’ means
14 systems that use water that is at a temperature be-
15 tween approximately 38 degrees Celsius and 149 de-
16 grees Celsius directly or through a heat exchanger to
17 provide—

18 “(A) heating to buildings; or

19 “(B) heat required for industrial processes,
20 agriculture, aquaculture, and other facilities.

21 “(2) GEOTHERMAL HEAT PUMP.—The term
22 ‘geothermal heat pump’ means a system that pro-
23 vides heating and cooling by exchanging heat from
24 shallow ground or surface water using—

1 “(A) a closed loop system, which transfers
2 heat via buried or immersed pipes that contain
3 a mix of water and antifreeze; or

4 “(B) an open loop system, which circulates
5 ground or surface water directly into the build-
6 ing and returns the water to the same aquifer
7 or surface water source.

8 “(3) LARGE-SCALE APPLICATION.—The term
9 ‘large-scale application’ means an application for
10 space or process heating or cooling for large entities,
11 such as a large building, commercial district, resi-
12 dential community, or a large municipal, agricul-
13 tural, or industrial project.

14 “(4) SECRETARY.—The term ‘Secretary’ means
15 Secretary of Energy, acting through the Assistant
16 Secretary for Energy Efficiency and Renewable En-
17 ergy.

18 “(d) PROGRAM.—

19 “(1) IN GENERAL.—The Secretary shall estab-
20 lish a program of research, development, demonstra-
21 tion, and commercial application for geothermal heat
22 pumps and the direct use of geothermal energy.

23 “(2) AREAS.—The program may include re-
24 search, development, demonstration, and commercial
25 application of—

1 “(A) geothermal ground loop efficiency im-
2 provements through more efficient heat transfer
3 fluids;

4 “(B) geothermal ground loop efficiency im-
5 provements through more efficient thermal
6 grouts for wells and trenches;

7 “(C) geothermal ground loop installation
8 cost reduction through—

9 “(i) improved drilling methods; and

10 “(ii) improvements in drilling equip-
11 ment;

12 “(D) installing geothermal ground loops
13 near the foundation walls of new construction
14 to take advantage of existing structures;

15 “(E) using gray or black wastewater as a
16 method of heat exchange;

17 “(F) improving geothermal heat pump sys-
18 tem economics through integration of geo-
19 thermal systems with other building systems,
20 including providing hot and cold water and re-
21 jecting or circulating industrial process heat
22 through refrigeration heat rejection and waste
23 heat recovery;

24 “(G) advanced geothermal systems using
25 variable pumping rates to increase efficiency;

1 “(H) geothermal heat pump efficiency im-
2 provements;

3 “(I) use of hot water found in mines and
4 mine shafts and other surface waters as the
5 heat exchange medium;

6 “(J) heating of districts, neighborhoods,
7 communities, large commercial or public build-
8 ings (including office, retail, educational, gov-
9 ernment, and institutional buildings and multi-
10 family residential buildings and campuses), and
11 industrial and manufacturing facilities;

12 “(K) geothermal system integration with
13 solar thermal water heating or cool roofs and
14 solar-regenerated desiccants to balance loads
15 and use building hot water to store geothermal
16 energy;

17 “(L) use of hot water coproduced from oil
18 and gas recovery;

19 “(M) use of water sources at a tempera-
20 ture of less than 150 degrees Celsius for direct
21 use;

22 “(N) system integration of direct use with
23 geothermal electricity production; and

24 “(O) coproduction of heat and power, in-
25 cluding on-site use.

1 “(3) ENVIRONMENTAL IMPACTS.—In carrying
2 out the program, the Secretary shall identify and
3 mitigate potential environmental impacts in accord-
4 ance with section 614(c).

5 “(e) GRANTS.—

6 “(1) IN GENERAL.—The Secretary shall make
7 grants available to State and local governments, in-
8 stitutions of higher education, nonprofit entities,
9 utilities, and for-profit companies (including manu-
10 facturers of heat-pump and direct-use components
11 and systems) to promote the development of geo-
12 thermal heat pumps and the direct use of geo-
13 thermal energy.

14 “(2) PRIORITY.—In making grants under this
15 subsection, the Secretary shall give priority to pro-
16 posals that apply to large buildings (including office,
17 retail, educational, government, institutional, and
18 multifamily residential buildings and campuses and
19 industrial and manufacturing facilities), commercial
20 districts, and residential communities.

21 “(3) NATIONAL SOLICITATION.—Not later than
22 180 days after the date of enactment of this section,
23 the Secretary shall conduct a national solicitation for
24 applications for grants under this section.

25 “(f) REPORTS.—

1 “(1) IN GENERAL.—Not later than 2 years
2 after the date of enactment of this section and annu-
3 ally thereafter, the Secretary shall submit to the
4 Committee on Energy and Natural Resources of the
5 Senate and the Committee on Science and Tech-
6 nology of the House of Representatives a report on
7 progress made and results obtained under this sec-
8 tion to develop geothermal heat pumps and direct
9 use of geothermal energy.

10 “(2) AREAS.—Each of the reports required
11 under this subsection shall include—

12 “(A) an analysis of progress made in each
13 of the areas described in subsection (d)(2); and

14 “(B)(i) a description of any relevant rec-
15 ommendations made during a review of the pro-
16 gram; and

17 “(ii) any plans to address the rec-
18 ommendations under clause (i).

19 “(g) AUTHORIZATION OF APPROPRIATIONS.—There
20 are authorized to be appropriated to the Secretary to carry
21 out this section such sums as are necessary for each of
22 fiscal years 2011 through 2015.”.

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