

114TH CONGRESS
1ST SESSION

S. 1155

To promote the mapping and development of United States geothermal resources by establishing a direct loan program for high risk geothermal exploration wells, 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

APRIL 30, 2015

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

A BILL

To promote the mapping and development of United States geothermal resources by establishing a direct loan program for high risk geothermal exploration wells, 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,*

1 **SECTION 1. SHORT TITLE.**

2 This Act may be cited as the “Geothermal Explo-
3 ration and Technology Act of 2015”.

4 **SEC. 2. GEOTHERMAL EXPLORATORY DRILLING LOAN PRO-**
5 **GRAM.**

6 (a) DEFINITIONS.—In this section:

7 (1) FUND.—The term “Fund” means the Geo-
8 thermal Investment Fund established under sub-
9 section (h).

10 (2) PROGRAM.—The term “program” means
11 the direct loan program for high risk geothermal ex-
12 ploration wells established under this section.

13 (3) SECRETARY.—The term “Secretary” means
14 the Secretary of Energy.

15 (b) ESTABLISHMENT.—The Secretary shall establish
16 a direct loan program for high risk geothermal exploration
17 wells.

18 (c) APPLICATIONS.—An applicant that seeks to re-
19 ceive a loan under the program may submit to the Sec-
20 retary an application for the loan at such time, in such
21 form, and containing such information as the Secretary
22 may prescribe.

23 (d) PROJECT CRITERIA.—

24 (1) IN GENERAL.—In selecting applicants for
25 loans under this section to carry out projects under
26 the program, the Secretary shall consider—

1 (A) the potential for unproven geothermal
2 resources that would be explored and developed
3 under a project;

4 (B) the expertise and experience of an ap-
5 plicant in developing geothermal resources; and

6 (C) the importance of the project in meet-
7 ing the goals of the Department of Energy.

8 (2) PREFERENCE.—In selecting applicants for
9 loans under this section to carry out projects under
10 the program, the Secretary shall provide a pref-
11 erence for projects likely to lead to successful new
12 geothermal development leading to electricity pro-
13 duction.

14 (e) DATA SHARING.—Data from all exploratory wells
15 that are carried out under the program shall be provided
16 to the Secretary and the Secretary of the Interior for use
17 in mapping national geothermal resources and other uses,
18 including—

19 (1) subsurface geologic data;

20 (2) metadata;

21 (3) borehole temperature data; and

22 (4) inclusion in the National Geothermal Data
23 System of the Department of Energy.

24 (f) ADMINISTRATION.—

25 (1) COST SHARE.—

1 (A) IN GENERAL.—The Secretary shall de-
2 termine the cost share for a loan made under
3 this section.

4 (B) HIGHER RISKS.—The Secretary may
5 base the cost share percentage for loans made
6 under this section on a sliding scale, with high-
7 er Federal shares awarded to projects with
8 higher risks.

9 (2) NUMBER OF WELLS.—The Secretary shall
10 determine the number of wells for each selected geo-
11 thermal project for which a loan may be made under
12 this section.

13 (3) UNPRODUCTIVE PROJECTS.—The Secretary
14 may grant further delays or dispense with the repay-
15 ment obligation on a demonstration that a selected
16 geothermal project is unproductive.

17 (g) LOAN REPAYMENT.—

18 (1) COMMENCEMENT.—The recipient of a loan
19 made under this section for a geothermal facility
20 shall commence repayment of the loan beginning on
21 the earlier of—

22 (A) the date that is 4 years after the date
23 the loan is made; or

24 (B) the date on which the geothermal facil-
25 ity enters into commercial production.

1 (2) TERM.—

2 (A) IN GENERAL.—Except as provided in
3 subparagraph (B), the term of a loan made
4 under this section shall be 4 years beginning on
5 the applicable loan repayment commencement
6 date under paragraph (1).

7 (B) EXTENSION.—The Secretary may ex-
8 tend the term of a loan under this section for
9 not more than 4 years.

10 (3) USE OF LOAN REPAYMENTS.—Amounts re-
11 paid on loans made under this section shall be de-
12 posited in the Fund.

13 (h) GEOTHERMAL INVESTMENT FUND.—

14 (1) ESTABLISHMENT OF FUND.—There is es-
15 tablished in the Treasury of the United States a
16 fund to be known as the “Geothermal Investment
17 Fund”, to be administered by the Secretary, to be
18 available without fiscal year limitation and not sub-
19 ject to appropriation, to carry out this section.

20 (2) TRANSFERS TO FUND.—The Fund shall
21 consist of—

22 (A) such amounts as are appropriated to
23 the Fund under subsection (j); and

24 (B) amounts repaid on loans under sub-
25 section (g)(3).

1 (3) PROHIBITION.—Amounts in the Fund may
2 not be made available for any purpose other than a
3 purpose described in paragraph (1).

4 (4) ANNUAL REPORTS.—

5 (A) IN GENERAL.—Not later than 60 days
6 after the end of each fiscal year beginning with
7 fiscal year 2016, the Secretary of Energy shall
8 submit to the the Committee on Energy and
9 Natural Resources of the Senate and the Com-
10 mittee on Energy and Commerce of the House
11 of Representatives a report on the operation of
12 the Fund during the fiscal year.

13 (B) CONTENTS.—Each report shall in-
14 clude, for the fiscal year covered by the report,
15 the following:

16 (i) A statement of the amounts depos-
17 ited into the Fund.

18 (ii) A description of the expenditures
19 made from the Fund for the fiscal year, in-
20 cluding the purpose of the expenditures.

21 (iii) Recommendations for additional
22 authorities to fulfill the purpose of the
23 Fund.

1 (iv) A statement of the balance re-
2 maining in the Fund at the end of the fis-
3 cal year.

4 (i) GUIDELINES.—

5 (1) IN GENERAL.—Not later than 180 days
6 after the date of enactment of this Act, the Sec-
7 retary shall issue guidelines for the implementation
8 of the program.

9 (2) ADMINISTRATION.—The guidelines shall—

10 (A) specify—

11 (i) the terms and conditions that
12 would require a higher or lower level of
13 cost sharing under this section;

14 (ii) the conditions under which the
15 Secretary will allow loan modifications or
16 forgiveness in cases in which a well cannot
17 be used for production or injection; and

18 (iii) the information necessary to pro-
19 vide a loan applicant with certainty about
20 application of subsection (f), including the
21 level of cost and risk that the applicant
22 and the Secretary will assume; and

23 (B) require that—

24 (i) loans be provided under this sec-
25 tion only after the developer has committed

1 the share of the developer for expenditures
2 for drilling costs; and

3 (ii) loans for successful wells shall be
4 repaid by the developer within a 10-year
5 period.

6 (j) AUTHORIZATION OF APPROPRIATIONS.—There
7 are authorized to be appropriated to carry out this section
8 such sums as are necessary for each of fiscal years 2016
9 through 2025.

10 **SEC. 3. LARGE-SCALE GEOTHERMAL ENERGY.**

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

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

15 “(a) FINDINGS.—Congress finds that—

16 “(1) the Geothermal Technologies Program of
17 the Office of Energy Efficiency and Renewable En-
18 ergy of the Department has included a focus on di-
19 rect use of geothermal energy in the low-temperature
20 geothermal energy subprogram (including in the de-
21 velopment of a research and development plan for
22 the program);

23 “(2) the Building Technologies Program of the
24 Office of Energy Efficiency and Renewable Energy
25 of the Department—

1 “(A) is focused on the energy demand and
2 energy efficiency of buildings; and

3 “(B) includes geothermal heat pumps as a
4 component technology in the residential and
5 commercial deployment activities of the pro-
6 gram; and

7 “(3) geothermal heat pumps and direct use of
8 geothermal energy, especially in large-scale applica-
9 tions, can make a significant contribution to the use
10 of renewable energy but are underrepresented in re-
11 search, development, demonstration, and commer-
12 cialization.

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

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

17 “(2) to increase the energy efficiency, lower the
18 cost, increase the use, and improve and demonstrate
19 the applicability of geothermal heat pumps to, and
20 the direct use of geothermal energy in, large build-
21 ings, commercial districts, residential communities,
22 and large municipal, agricultural, or industrial
23 projects.

24 “(c) DEFINITIONS.—In this section:

1 “(1) DIRECT USE OF GEOTHERMAL ENERGY.—

2 The term ‘direct use of geothermal energy’ means
3 systems that use water that is at a temperature be-
4 tween approximately 38 degrees Celsius and 149 de-
5 grees Celsius directly or through a heat exchanger to
6 provide—

7 “(A) heating to buildings; or

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

10 “(2) GEOTHERMAL HEAT PUMP.—The term

11 ‘geothermal heat pump’ means a system that pro-
12 vides heating and cooling by exchanging heat from
13 shallow ground or surface water using—

14 “(A) a closed loop system, which transfers
15 heat by way of buried or immersed pipes that
16 contain a mix of water and antifreeze; or

17 “(B) an open loop system, which circulates
18 ground or surface water directly into the build-
19 ing and returns the water to the same aquifer
20 or surface water source.

21 “(3) LARGE-SCALE APPLICATION.—The term

22 ‘large-scale application’ means an application for
23 space or process heating or cooling for large entities
24 with a name-plate capacity, expected resource, or
25 rating of 10 or more megawatts, such as a large

1 building, commercial district, residential community,
2 or a large municipal, agricultural, or industrial
3 project.

4 “(4) SECRETARY.—The term ‘Secretary’ means
5 Secretary of Energy, acting through the Assistant
6 Secretary for Energy Efficiency and Renewable En-
7 ergy.

8 “(d) PROGRAM.—

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

13 “(2) AREAS.—The program may include re-
14 search, development, demonstration, and commercial
15 application of—

16 “(A) geothermal ground loop efficiency im-
17 provements through more efficient heat transfer
18 fluids;

19 “(B) geothermal ground loop efficiency im-
20 provements through more efficient thermal
21 grouts for wells and trenches;

22 “(C) geothermal ground loop installation
23 cost reduction through—

24 “(i) improved drilling methods;

1 “(ii) improvements in drilling equip-
2 ment;

3 “(iii) improvements in design method-
4 ology and energy analysis procedures; and

5 “(iv) improved methods for deter-
6 mination of ground thermal properties and
7 ground temperatures;

8 “(D) installing geothermal ground loops
9 near the foundation walls of new construction
10 to take advantage of existing structures;

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

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

20 “(G) advanced geothermal systems using
21 variable pumping rates to increase efficiency;

22 “(H) geothermal heat pump efficiency im-
23 provements;

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

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

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

15 “(L) use of hot water coproduced from oil
16 and gas recovery;

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

20 “(N) system integration of direct use with
21 geothermal electricity production; and

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

24 “(3) ENVIRONMENTAL IMPACTS.—In carrying
25 out the program, the Secretary shall identify and

1 mitigate potential environmental impacts in accord-
2 ance with section 614(e).

3 “(e) GRANTS.—

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

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

19 “(3) NATIONAL SOLICITATION.—Not later than
20 180 days after the date of enactment of this section,
21 the Secretary shall conduct a national solicitation for
22 applications for grants under this section.

23 “(f) REPORTS.—

24 “(1) IN GENERAL.—Not later than 2 years
25 after the date of enactment of this section and annu-

1 ally thereafter, the Secretary shall submit to the
 2 Committee on Energy and Natural Resources of the
 3 Senate and the Committee on Science and Tech-
 4 nology of the House of Representatives a report on
 5 progress made and results obtained under this sec-
 6 tion to develop geothermal heat pumps and direct
 7 use of geothermal energy.

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

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

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

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

17 “(g) AUTHORIZATION OF APPROPRIATIONS.—There
 18 are authorized to be appropriated to the Secretary to carry
 19 out this section such sums as are necessary for each of
 20 fiscal years 2016 through 2020.”.

21 **SEC. 4. FACILITATION OF COPRODUCTION OF GEO-**
 22 **THERMAL ENERGY ON OIL AND GAS LEASES.**

23 Section 4(b) of the Geothermal Steam Act of 1970
 24 (30 U.S.C. 1003(b)) is amended by adding at the end the
 25 following:

1 “(4) LAND SUBJECT TO OIL AND GAS LEASE.—
2 Land under an oil and gas lease issued pursuant to
3 the Mineral Leasing Act (30 U.S.C. 181 et seq.) or
4 the Mineral Leasing Act for Acquired Lands (30
5 U.S.C. 351 et seq.) that is subject to an approved
6 application for permit to drill and from which oil
7 and gas production is occurring may be available for
8 leasing under subsection (c) by the holder of the oil
9 and gas lease—

10 “(A) on a determination that—

11 “(i) geothermal energy will be pro-
12 duced from a well producing or capable of
13 producing oil and gas; and

14 “(ii) the public interest will be served
15 by the issuance of such a lease; and

16 “(B) in order to provide for the coproduc-
17 tion of geothermal energy with oil and gas.”.

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