



(Original Signature of Member)

118TH CONGRESS  
2D SESSION

**H. R.** \_\_\_\_\_

To amend the Energy Independence and Security Act of 2007 to direct research, development, demonstration, and commercial application activities in support of supercritical geothermal and closed-loop geothermal systems in supercritical various conditions, and for other purposes.

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IN THE HOUSE OF REPRESENTATIVES

Mr. LUCAS introduced the following bill; which was referred to the Committee  
on \_\_\_\_\_

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**A BILL**

To amend the Energy Independence and Security Act of 2007 to direct research, development, demonstration, and commercial application activities in support of supercritical geothermal and closed-loop geothermal systems in supercritical various conditions, 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 “Supercritical Geo-  
5 thermal Research and Development Act”.

1 **SEC. 2. GEOTHERMAL ENERGY.**

2 (a) IN GENERAL.—The Energy Independence and  
3 Security Act of 2007 is amended—

4 (1) in section 612 (42 U.S.C. 17191; relating  
5 to definitions)—

6 (A) by redesignating paragraph (8) as  
7 paragraph (9); and

8 (B) by inserting after paragraph (7) the  
9 following new paragraph:

10 “(8) SUPERCRITICAL GEOTHERMAL.—The term  
11 ‘supercritical geothermal’ means energy derived from  
12 a subsurface rock resource in-situ existing at or  
13 above the supercritical conditions of the primary  
14 fluid present.”;

15 (2) in section 613 (42 U.S.C. 17192; relating  
16 to hydrothermal research and development), by  
17 striking “advanced geologic tools to assist” and in-  
18 serting “advanced tools, including machine learning  
19 algorithms, to assist”;

20 (3) in section 614 (42 U.S.C. 17193; relating  
21 to general geothermal systems research and develop-  
22 ment)—

23 (A) in paragraph (1) of subsection (d), by  
24 striking “among the Office of Fossil Energy,  
25 the Office of Energy Efficiency and Renewable

1 Energy,” and inserting “across the Depart-  
2 ment”; and

3 (B) in subsection (h)—

4 (i) in paragraph (1), by inserting  
5 “and publicly available subsurface data, in-  
6 cluding data reported as part of fossil fuel  
7 and mining operations,” after “geothermal  
8 drilling information”; and

9 (ii) in paragraph (2), by adding at the  
10 end the following new subparagraphs:

11 “(C) UPDATES.—The repository estab-  
12 lished under paragraph (1) shall be periodically  
13 updated in order to carry out the following:

14 “(i) Standardize data in a uniform  
15 manner to the maximum extent practicable  
16 and enable analysis across different  
17 projects.

18 “(ii) Enhance the accessibility and  
19 usability of data to increase analysis of  
20 geothermal energy, including enhanced,  
21 closed-loop, and supercritical geothermal,  
22 on regional, local, and site-specific scales.

23 “(iii) Increase uses of data, including  
24 data viewable by map and organization by  
25 common attributes such as region.

1                   “(iv) Make other improvements in  
2                   functionality and usability, as determined  
3                   by the Secretary.

4                   “(D)     MEMORANDUM     OF     UNDER-  
5                   STANDING.—The Secretary shall enter into a  
6                   memorandum of understanding with the Sec-  
7                   retary of the Interior, along with the heads of  
8                   other relevant Federal departments, for noti-  
9                   fying, sharing, and providing opportunities for  
10                  additional data collection regarding shared geo-  
11                  thermal development data from projects funded  
12                  by each such department, including data from  
13                  mining, critical minerals, and energy projects,  
14                  such as subsurface heat data, seismic data, li-  
15                  thology data, boundaries of State and federally  
16                  protected areas, and existing transmission ca-  
17                  pacity. To the maximum extent practicable, ac-  
18                  tivities conducted under such a memorandum of  
19                  understanding shall prioritize heat, lithology,  
20                  and strain profiles through deep exploration  
21                  boreholes and control points for deep heat map-  
22                  ping and geothermal development.

23                  “(E)     REGIONAL DEEP DATA PROBES.—  
24                  The Secretary shall work with the Secretary of  
25                  the Interior, who shall be responsible for com-

1 missioning the drilling of deep exploration  
2 boreholes deeper than eight kilometers in depth  
3 in representative geological provinces in the  
4 United States to provide control points for deep  
5 heat mapping and geothermal development. The  
6 resulting data shall include an exploration of  
7 heat, lithology, and strain profiles, and shall be  
8 shared publicly on the drilling data repository.”;

9 (4) in section 615 (42 U.S.C. 17194; relating  
10 to enhanced geothermal systems research and devel-  
11 opment)—

12 (A) in subsection (b)—

13 (i) in paragraph (11), by striking  
14 “and” after the semicolon;

15 (ii) in paragraph (12), by striking the  
16 period and inserting “; and”; and

17 (iii) by adding at the end the fol-  
18 lowing new paragraph:

19 “(13) the research topics specified in subpara-  
20 graphs (1) through (12) in supercritical condi-  
21 tions.”;

22 (B) in subsection (c), by adding at the end  
23 the following new paragraph:

24 “(8) SUPERCRITICAL NEXT GENERATION GEO-  
25 THERMAL TESTING.—Not later than one year after

1 the date of the enactment of this paragraph, the  
2 Secretary shall take such actions as may be nec-  
3 essary to ensure that at least one FORGE site has  
4 the capabilities to include supercritical geothermal  
5 testing and, if practicable and technically feasible,  
6 closed-loop geothermal systems in supercritical con-  
7 ditions.”; and

8 (C) by adding at the end the following new  
9 subsection:

10 “(e) SUPERCRITICAL GEOTHERMAL RESEARCH AND  
11 DEVELOPMENT PROGRAM.—

12 “(1) IN GENERAL.—Within the Geothermal  
13 Technologies Office of the Department, the Sec-  
14 retary shall support a program of supercritical geo-  
15 thermal research, development, demonstration, and  
16 commercial application activities and, if practicable  
17 and technically feasible, closed-loop geothermal sys-  
18 tems in supercritical conditions.

19 “(2) FOCUS AREAS.—

20 “(A) IN GENERAL.—The program de-  
21 scribed in paragraph (1) shall focus on the fol-  
22 lowing topics:

23 “(i) Well completion.

24 “(ii) Permeability creation and man-  
25 agement, including proppants and packers.

1                   “(iii) Materials development and  
2                   equipment design, including power produc-  
3                   tion, specific to supercritical geothermal  
4                   systems.

5                   “(iv) Sensor development.

6                   “(v) Water-rock geochemistry.

7                   “(vi) Rock properties.

8                   “(vii) Hard rock and deep drilling.

9                   “(viii) Any other topics the Secretary  
10                  determines necessary.

11                  “(B) ADMINISTRATION.—The Secretary  
12                  may administer grants to universities and pri-  
13                  vate sector entities to carry out activities on the  
14                  topics specified in subparagraph (A) and, to the  
15                  maximum extent practicable, share data, re-  
16                  sults, and information publicly.

17                  “(3) REPORT ON WATER USE.—Not later than  
18                  five years after the date of the enactment of this  
19                  subsection, the Secretary shall submit to the Com-  
20                  mittee on Natural Resources and the Committee on  
21                  Science, Space, and Technology of the House of  
22                  Representatives and the Committee on Energy and  
23                  Natural Resources of the Senate a report on the fol-  
24                  lowing:

1           “(A) Water use and estimated needs of en-  
2           hanced geothermal systems.

3           “(B) Water use and estimated needs for  
4           closed-loop, and superhot geothermal energy  
5           production.

6           “(4) NEXT GENERATION GEOTHERMAL CENTER  
7           OF EXCELLENCE.—

8           “(A) ESTABLISHMENT.—The Secretary  
9           shall award grants through a competitive,  
10          merit-reviewed process, to National Labora-  
11          tories (as such term is defined in section 2 of  
12          the Energy Policy Act of 2005 (42 U.S.C.  
13          15801)), multi-institutional collaborations, or  
14          institutes of higher education (or consortia  
15          thereof) for the following:

16               “(i) The continuation and expansion  
17               of research, development, demonstration,  
18               testing, and commercial application activi-  
19               ties applicable to FORGE sites.

20               “(ii) The establishment of a next-gen-  
21               eration geothermal center of excellence.

22           “(B) LOCATION.—In selecting institutions  
23           of higher education for a center referred to in  
24           subparagraph (A), the Secretary shall consider  
25           the following criteria:



1                   “(i) Whether the institution hosts an  
2                   existing geothermal energy research and  
3                   development program.

4                   “(ii) Whether the institution has prov-  
5                   en technical expertise to support geo-  
6                   thermal energy research.

7                   “(iii) Whether the institution has ac-  
8                   cess to geothermal resources.

9                   “(C) PURPOSE.—The center referred to in  
10                  subparagraph (A) shall coordinate among exist-  
11                  ing FORGE sites, the Department, and na-  
12                  tional laboratories to carry out the following:

13                   “(i) Advance research, development,  
14                   demonstration, and commercial application  
15                   of enhanced geothermal energy tech-  
16                   nologies, including supercritical geothermal  
17                   technologies, in response to industry and  
18                   commercial needs, including by partnering  
19                   with other academic or research institu-  
20                   tions, industry, non-governmental organi-  
21                   zations, and State, local, or Tribal govern-  
22                   ments.

23                   “(ii) Foster collaboration for edu-  
24                   cation, research, and partnership initiatives  
25                   in order to support the technology, deploy-

1                   ment, and workforce needs of the United  
2                   States geothermal energy industry, includ-  
3                   ing a focus on enhanced, closed-loop, and  
4                   supercritical geothermal systems.

5                   “(iii) Support workforce development  
6                   across the enhanced geothermal energy de-  
7                   velopment lifecycle.

8                   “(iv) Provide educational, technical,  
9                   and analytical assistance on enhanced geo-  
10                  thermal systems to Federal agencies, in-  
11                  dustry, and State, local, and Tribal govern-  
12                  ments.

13                  “(v) Collect and disseminate informa-  
14                  tion on best practices in all areas relating  
15                  to developing and managing geothermal  
16                  energy resources and energy systems, in-  
17                  cluding enhanced, closed-loop, and super-  
18                  critical geothermal.

19                  “(5) AUTHORIZATION OF APPROPRIATIONS.—  
20                  There are authorized to be appropriated to the Sec-  
21                  retary \$5,000,000 for each fiscal years 2026  
22                  through 2030 to carry out this subsection.”; and

23                  (5) in section 617 (42 U.S.C. 17196; relating  
24                  to organization and administration of programs)—

1 (A) in subsection (e), by striking “Com-  
2 mittee on Science and Technology” and insert-  
3 ing “Committee on Science, Space, and Tech-  
4 nology”; and

5 (B) by amending subsection (f) to read as  
6 follows:

7 “(f) PROGRESS REPORTS.—Not later than one year  
8 after the date of the enactment of this subsection and  
9 every two years thereafter, the Secretary shall submit to  
10 the Committee on Science, Space, and Technology of the  
11 House of Representatives and the Committee on Energy  
12 and Natural Resources of the Senate a report that con-  
13 tains the following:

14 “(1) A description of the maximum potential of  
15 geothermal resources in the United States.

16 “(2) Information relating to the results of  
17 projects undertaken under this section.

18 “(3) An assessment of the barriers to commer-  
19 cialization of enhanced, closed-loop, and supercritical  
20 geothermal technologies.

21 “(4) Such other information as the Secretary  
22 considers appropriate.”.

23 (b) UPDATE TO GEOTHERMAL RESOURCE ASSESS-  
24 MENT.—

1           (1) IN GENERAL.—Section 2501 of the Energy  
2 Policy Act of 1992 (30 U.S.C. 1028) is amended—

3           (A) in subsection (c)—

4                 (i) in the matter preceding paragraph  
5 (1), by inserting “quadrennially” before  
6 “update”; and

7                 (ii) in paragraph (1)(D)(ii), by strik-  
8 ing “and” after the semicolon;

9                 (iii) in paragraph (2), by striking the  
10 period and inserting “; and”; and

11                 (iv) by adding at the end the following  
12 new paragraph:

13                 “(3) assessing regions of the United States with  
14 significant potential for supercritical geothermal.”;  
15 and

16           (B) by striking subsection (d).

17           (2) FIRST UPDATE.—The first quadrennial up-  
18 date to the geothermal resource assessment carried  
19 out by the United States Geological Survey under  
20 subsection (c) of section 2501 of the Energy Policy  
21 Act of 1992, as amended by paragraph (1), shall be  
22 completed by not later than 180 days after the date  
23 of the enactment of this Act.