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(Original Signature of Member)

119TH CONGRESS
1ST 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 next-generation geothermal and closed-loop geothermal systems in various conditions, and for other purposes.

IN THE HOUSE OF REPRESENTATIVES

M__. _____ introduced the following bill; which was referred to the Committee on _____

A BILL

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

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SECTION 1. SHORT TITLE.

This Act may be cited as the ''Next-Generation Geothermal Research and Development Act''.

SEC. 2. GEOTHERMAL ENERGY.

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

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

(A) by redesignating paragraphs (1), (2), (3), (4), (5), (6), (7), and (8) as paragraphs (2), (3), (4), (5), (6), (7), (8), and (10), respectively;

(B) by inserting before paragraph (2), as so redesignated, the following new paragraph:

''(1) CLOSED-LOOP GEOTHERMAL SYSTEMS.—The term 'closed-loop geothermal systems' means a wellbore or subsurface circuit of wellbores containing a fluid heated through contact with the borehole wall.'';

(C) by inserting after paragraph (8), as so redesignated, the following new paragraph:

''(9) NEXT-GENERATION GEOTHERMAL SYSTEMS.—The term 'next-generation geothermal systems' means—

''(A) enhanced geothermal systems;

''(B) closed-loop geothermal systems; and

''(C) in supercritical conditions—

''(i) enhanced geothermal systems; or

''(ii) closed-loop geothermal systems.'';

and

(D) by adding at the end the following new paragraph:

''(11) SUPERCRITICAL GEOTHERMAL.—The term 'supercritical geothermal' means energy derived from a subsurface rock resource in-situ existing at or above the supercritical conditions, whether relating to temperature or pressure, of the primary fluid present.'';

(2) in section 613(b)(1) (42 U.S.C. 17192(b)(1); relating to hydrothermal research and development), by striking ''advanced geologic tools to assist'' and inserting ''advanced tools, including machine learning algorithms, to assist'';

(3) in section 614 (42 U.S.C. 17193; relating to general geothermal systems research and development)—

(A) in subsection (d)(1), by striking ''among the Office of Fossil Energy, the Office of Energy Efficiency and Renewable Energy,'' and inserting ''across the Department''; and

(B) in subsection (h)—

(i) in paragraph (1), by inserting ''and publicly available subsurface data, in-

cluding data reported as part of fossil fuel and mining operations,'' after ''geothermal drilling information''; and

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

''(C) UPDATES.—The repository established under paragraph (1) shall be periodically updated in order to carry out the following:

''(i) Standardize data in a uniform manner to the maximum extent practicable and enable analysis across different projects.

''(ii) Enhance the accessibility and usability of data to increase analysis of geothermal energy, including enhanced geothermal systems, closed-loop geothermal systems, and supercritical geothermal, on regional, local, and site-specific scales.

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

''(iv) Make other improvements in functionality and usability, as determined by the Secretary.

"(D) MEMORANDUM OF UNDERSTANDING.—

"(i) IN GENERAL.—The Secretary shall enter into a memorandum of understanding with the Secretary of the Interior, and with the heads of other relevant Federal departments, for notifying, sharing, and providing opportunities for additional data collection regarding shared geothermal development data from projects funded by the Department of the Interior and each such other relevant department, including data from mining, critical minerals, and energy projects, such as subsurface heat data, seismic data, lithology data, boundaries of State and federally protected areas, and existing transmission capacity.

"(ii) PRIORITIZATION.—To the maximum extent practicable, activities conducted pursuant to a memorandum of understanding under clause (i) shall prioritize heat, lithology, and strain profiles through deep exploration boreholes and control

points for deep heat mapping and geothermal development.'';

(4) in section 615 (42 U.S.C. 17194; relating to enhanced geothermal systems research and development)—

(A) in the section heading, by inserting ''**AND CLOSED-LOOP**'' after ''**ENHANCED**'';

(B) in subsection (a), by inserting ''and closed-loop'' after ''enhanced'';

(C) in subsection (b)—

(i) in the heading, by inserting ''AND CLOSED-LOOP'' after ''ENHANCED'';

(ii) in the matter preceding paragraph (1), by inserting ''and closed-loop'' after ''enhanced'';

(iii) in paragraph (11), by striking ''and'' after the semicolon;

(iv) in paragraph (12), by striking the period and inserting ''; and''; and

(v) by adding at the end the following new paragraph:

''(13) the research topics specified in subparagraphs (1) through (12) in supercritical conditions.'';

(D) in subsection (c)—

(i) by redesignating paragraph (7) as paragraph (8); and

(ii) by inserting after paragraph (6) the following new paragraph:

''(7) NEXT-GENERATION GEOTHERMAL TESTING.—Not later than one year after the date of the enactment of this paragraph, the Secretary shall take such actions as may be necessary to ensure that at least one FORGE site has the capabilities to include next-generation geothermal testing, including, if practicable and technically feasible, closed-loop geothermal systems in supercritical conditions.''; and

(E) by adding at the end the following new subsection:

''(e) NEXT-GENERATION GEOTHERMAL RESEARCH AND DEVELOPMENT PROGRAM.—

''(1) IN GENERAL.—Within the Geothermal Technologies Office of the Department, the Secretary shall support a program of next-generation geothermal research, development, demonstration, and commercial application activities, including, if practicable and technically feasible, closed-loop geothermal systems in supercritical conditions.

''(2) FOCUS AREAS.—

''(A) IN GENERAL.—The program described in paragraph (1) shall focus on the following topics:

''(i) Well completion.

''(ii) Permeability creation and management, including proppants and packers.

''(iii) Materials development and equipment design, including power production, specific to supercritical geothermal systems.

''(iv) Sensor development.

''(v) Water-rock geochemistry.

''(vi) Rock properties.

''(vii) Hard rock and deep drilling.

''(viii) Any other topics the Secretary determines necessary.

''(B) MILESTONE-BASED GRANTS.—In carrying out next-generation geothermal research under the program described in paragraph (1), the Secretary shall award milestone-based grants for deep drilling projects in unique geodynamic settings at each of the following milestones:

''(i) Characterization and crustal stress.

"(ii) Lab work.

"(iii) Drilling.

"(iv) Stimulation.

"(v) Power production.

"(C) ADMINISTRATION.—The Secretary may administer grants to institutions of higher education and private sector entities to carry out activities on the topics specified in subparagraphs (A) and (B) and, to the maximum extent practicable, share data, results, and information publicly.

"(3) REPORT ON WATER USE.—Not later than five years after the date of the enactment of this subsection, the Secretary shall submit to the Committee on Natural Resources and the Committee on Science, Space, and Technology of the House of Representatives and the Committee on Energy and Natural Resources of the Senate a report on the following:

"(A) Water use and estimated needs of enhanced geothermal systems.

"(B) Water use and estimated needs for closed-loop, and next-generation geothermal energy production.

''(C) The ability of next-generation geothermal systems to use brackish and nonpotable water.

''(D) The withdrawal and consumption of water per megawatt hour of next-generation geothermal systems, as compared to other power-generation technologies.

''(E) Technological and operational improvements that could lead to decreases in water withdrawal and consumption of next-generation geothermal systems.

''(4) NEXT-GENERATION GEOTHERMAL CENTER OF EXCELLENCE.—

''(A) ESTABLISHMENT.—The Secretary shall award grants through a competitive, merit-reviewed process, to National Laboratories (as such term is defined in section 2 of the Energy Policy Act of 2005 (42 U.S.C. 15801)), multi-institutional collaborations, public-private partnerships, or institutes of higher education (or consortia thereof) for the following:

''(i) The continuation and expansion of research, development, demonstration, testing, and commercial application activi-

ties applicable to FORGE sites, including activities in supercritical conditions.

''(ii) The establishment of a next-generation geothermal systems center of excellence.

''(B) LOCATION.—In selecting National Laboratories, multi-institutional collaborations, public-private partnerships, or institutions of higher education (or a consortia thereof) for a center of excellence referred to in subparagraph (A), the Secretary shall consider the following criteria:

''(i) Whether the entity hosts an existing geothermal energy research and development program.

''(ii) Whether the entity has proven technical expertise to support geothermal energy research.

''(iii) Whether the entity has access to geothermal resources.

''(C) PURPOSE.—The center of excellence referred to in subparagraph (A) shall coordinate among existing FORGE sites, the Department, and National Laboratories to carry out the following:

''(i) Advance research, development, demonstration, and commercial application of next-generation geothermal energy technologies, including supercritical geothermal technologies, in response to industry and commercial needs, including by partnering with other academic or research institutions, industry, non-governmental organizations, and State, local, or Tribal governments.

''(ii) Foster collaboration for education, research, and partnership initiatives in order to support the technology, deployment, and workforce needs of the United States geothermal energy industry, including a focus on next-generation geothermal systems.

''(iii) Support workforce development across the next-generation geothermal systems energy development lifecycle.

''(iv) Provide educational, technical, and analytical assistance on next-generation geothermal systems to Federal agencies, industry, and State, local, and Tribal governments.

''(v) Collect and disseminate information on best practices in all areas relating to developing and managing geothermal energy resources and energy systems, including next-generation geothermal systems.

''(5) COMMERICAL-READINESS INNOVATION GRANTS.—

''(A) IN GENERAL.—The Secretary shall award grants to accelerate the development, testing, and implementation of innovative technologies identified by in-field operations as areas for improving the performance of commercial geothermal energy projects using enhanced geothermal systems and closed-loop geothermal systems.

''(B) FOCUS AREAS.—Grants may be awarded under this paragraph for innovative technologies, including the following:

''(i) Hardrock drilling equipment, components, and systems, including bit design and vibration control.

''(ii) Reservoir characterization, well design and spacing, and completions.

''(iii) Data acquisition and analysis, including fiber optic sensing tools and methodologies.

''(C) APPLICATIONS.—

''(i) IN GENERAL.—An entity seeking a grant under this paragraph shall submit to the Secretary an application at such time, in such manner, and containing such information as the Secretary may require.

''(ii) PRIORITIZATION.—In awarding grants under this paragraph, the Secretary shall give priority to the following:

''(I) Applicants, especially for-profit entities and public-private partnerships, with demonstrated success relating to in-field development and commercial operations for geothermal energy projects.

''(II) Projects with the greatest ability to advance near-term commercial deployment of enhanced geothermal systems and closed-loop geothermal systems.

''(III) Projects that advance the commercialization of geothermal en-

ergy projects in diverse geological conditions or supercritical conditions.

''(D) COST SHARING.—The Federal share of the cost of a project carried out with a grant under this paragraph shall be not more than 80 percent.

''(6) NEXT-GENERATION GEOTHERMAL SYSTEMS SURFACE FACILITY INNOVATION GRANTS.—

''(A) IN GENERAL.—The Secretary shall award grants for innovation in the operation, cost, and design of surface facility components of next-generation geothermal systems.

''(B) FOCUS AREAS.—Grants may be awarded under this paragraph for development and testing of innovative technologies, including the following:

''(i) Improved organic Rankine cycle generation efficiency, working fluids, and performance at low and superhot temperatures.

''(ii) Improved performance of air-cooled condensers in warm ambient weather conditions, and improved efficiency of water-cooled condensers.

''(iii) Component and facility design, including gathering lines, generation unit standardization, and data collection and monitoring.

''(C) APPLICATIONS.—

''(i) IN GENERAL.—An entity seeking a grant under this paragraph shall submit to the Secretary an application at such time, in such manner, and containing such information as the Secretary may require.

''(ii) PRIORITIZATION.—In awarding grants under this paragraph, the Secretary shall give priority to the following:

''(I) Applicants, especially private entities and public-private partnerships, with demonstrated success relating to in-field operation of geothermal energy technologies, including manufacturing power generation and industrial energy components.

''(II) Projects with the greatest ability to advance near-term commercial deployment of geothermal energy projects.

''(III) Projects that advance the commercialization of geothermal energy projects in diverse geological conditions or in supercritical conditions.

''(7) AUTHORIZATION OF APPROPRIATIONS.—There are authorized to be appropriated to the Secretary $5,000,000 for each fiscal years 2026 through 2030 to carry out this subsection.''; and

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

(A) in subsection (e), by striking ''Committee on Science and Technology'' and inserting ''Committee on Science, Space, and Technology''; and

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

''(f) PROGRESS REPORTS.—Not later than one year after the date of the enactment of this subsection and every two years thereafter, the Secretary shall submit to the Committee on Science, Space, and Technology of the House of Representatives and the Committee on Energy and Natural Resources of the Senate a report that contains the following:

''(1) A description of the maximum potential of geothermal resources in the United States, including

a consideration of next-generation geothermal systems.

''(2) Information relating to the results of projects undertaken under this section.

''(3) An assessment of the barriers to commercialization of next-generation geothermal technologies.

''(4) Such other information as the Secretary considers appropriate.''.

(b) CLERICAL AMENDMENT.—The table of contents in section 1(b) of the Energy Independence and Security Act of 2007 is amended by amending the item relating to section 615 to read as follows:

''Sec. 615. Enhanced and closed-loop geothermal systems research and development.''.