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(Original Signature of Member)

119TH CONGRESS
2D SESSION

H. R. _____

To establish programs and requirements related to the production of geothermal energy in the United States, and for other purposes.

IN THE HOUSE OF REPRESENTATIVES

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

A BILL

To establish programs and requirements related to the production of geothermal energy in the United States, 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 ''Hot Rock Act''.

SEC. 2. DEFINITIONS.

In this Act:

(1) GEOTHERMAL ENERGY.—The term ''geothermal energy'' has the meaning given such term in

section 45(c)(4) of the Internal Revenue Code of 1986.

(2) GEOTHERMAL RESERVOIR.—The term ''geothermal reservoir'' means an underground reservoir containing a geothermal resource or deposit, whether the fluids in the reservoir are native to the reservoir or flow into or are injected into the reservoir.

(3) HOT DRY ROCK.—The term ''hot dry rock'' means a superhot geothermal resource or supercritical geothermal resources that exists within rocks that have little to no natural permeability.

(4) HOT DRY ROCK GEOTHERMAL PROJECT.—The term ''hot dry rock geothermal project'' means the combined surface and subsurface facilities used to produce electricity or industrial heat from hot dry rock using a next-generation geothermal system.

(5) NEXT-GENERATION GEOTHERMAL SYSTEM.—The term ''next-generation geothermal system'' means a geothermal reservoir system that is engineered, as opposed to occurring naturally.

(6) SUPERCRITICAL GEOTHERMAL RESOURCE.—The term ''supercritical geothermal resource'' means a geothermal resource or deposit that—

(A) consists of natural heat stored in rocks or in an aqueous liquid or vapor (whether or not under pressure); and

(B) exists at a temperature equal to or greater than 375 degrees Celsius.

(7) SUPERHOT GEOTHERMAL RESOURCE.—The term ''superhot geothermal resource'' means a geothermal resource or deposit that—

(A) consists of natural heat stored in rocks or in an aqueous liquid or vapor (whether or not under pressure); and

(B) exists at a temperature—

(i) equal to 300 degrees Celsius or 374 degrees Celsius; or

(ii) between 300 degrees Celsius and 374 degrees Celsius.

SEC. 3. HOT DRY ROCK GEOTHERMAL ENERGY RESEARCH, TESTING, DEVELOPMENT, AND DEMONSTRATION.

(a) SENSE OF CONGRESS.—It is the sense of Congress that the programs in this section should—

(1) effectively address the scientific and engineering challenges with regard to developing—

(A) cost-competitive hot dry rock geothermal projects; and

(B) the hot dry rock geothermal energy industry in the United States; and

(2) support the development of a pathway to producing hot dry rock geothermal energy on a commercial scale.

(b) RESEARCH GRANT PROGRAMS.—

(1) HIGH-TEMPERATURE COMPLETIONS RESEARCH, TESTING, AND DEVELOPMENT.—The Secretary shall establish a grant program to award amounts to eligible entities to research, test, and develop high-temperature completions, including—

(A) the research and testing of high-temperature water-rock casings, cements, stimulation tools, and geochemistry; and

(B) the testing and development of high-temperature casing and completions.

(2) HIGH-TEMPERATURE AND HIGH-PRESSURE SENSING EQUIPMENT DEVELOPMENT.—The Secretary shall establish a grant program to award amounts to eligible entities—

(A) to develop high-temperature and high-pressure sensing equipment; and

(B) to support the development of equipment that can be used for screening, monitoring, and characterizing the subsurface in an

environment of extreme depths, temperatures, and pressures.

(3) SUPERCRITICAL FLUID PROPERTIES RESEARCH AND TESTING.—The Secretary shall establish a grant program to award amounts to eligible entities to research and test the properties of supercritical fluids, fluid flow, fluid-rock interactions, and fluid assurance characterization.

(4) HIRING AND STAFFING.—The Secretary shall establish a program to increase staffing relevant to the grant programs established under paragraphs (1) through (3) and to contract with scientists to assist with the research, testing, and technological development associated with the grant programs established under paragraphs (1) through (3).

(5) APPLICATIONS.—To be eligible for a grant under paragraph (1), (2), or (3), an eligible entity shall submit to the Secretary an application in such form, at such time, and containing such information as the Secretary determines appropriate.

(6) AUTHORIZATION OF APPROPRIATIONS.—There are authorized to be appropriated to the Secretary to carry out the grant programs established under this subsection $16,000,000 for each of fiscal years 2027 through 2031.

(c) FRONTIER OBSERVATORY AND TESTING SITE FOR HOT DRY ROCK GEOTHERMAL ENERGY TECHNOLOGY PROGRAM.—

(1) IN GENERAL.—The Secretary shall establish a program for eligible entities to construct a field research site—

(A) to test, experiment with, and demonstrate hot dry rock geothermal projects, including drilling completion, reservoir creation, flow testing, and production characteristics; and

(B) to provide an advanced and well-resourced facility with access to a site with required geology, as determined by the Secretary, including lithology, composition, and temperature and depth gradients.

(2) AUTHORIZATION OF APPROPRIATIONS.—There is authorized to be appropriated to the Secretary to carry out this subsection $40,000,000 for each of fiscal years 2027 through 2031.

(d) HOT DRY ROCK GEOTHERMAL ENERGY SYSTEMS RESEARCH, DEVELOPMENT, AND DEMONSTRATION ACTIVITIES.—

(1) IN GENERAL.—The Secretary shall establish a program to support research, development, and demonstration activities and facility operations of el-

igible entities to provide solutions to challenges to the establishment of a commercial hot dry rock geothermal project, including the following:

(A) The technical feasibility of subsurface infrastructure for supercritical fluids.

(B) Geothermal reservoir management and thermal drawdown research.

(C) Advanced deep drilling methods, which includes—

(i) researching, developing, and demonstrating energy-based drilling and novel drilling methods;

(ii) researching thermal physical properties of rock at extreme temperatures and pressure conditions; and

(iii) researching the crustal stress and geomechanics for drilling performed during hot dry rock geothermal projects.

(D) Proppant research for fracture systems in hot dry rock geothermal projects.

(E) Wellbore integrity and construction.

(2) AUTHORIZATION OF APPROPRIATIONS.—There are authorized to be appropriated to the Secretary to carry out this subsection $16,000,000 for each of fiscal years 2027 through 2031.

(e) MILESTONE-BASED DEVELOPMENT GRANT PROGRAM.—

(1) IN GENERAL.—The Secretary shall establish a grant program to award set amounts to eligible entities that demonstrate the achievement of a program milestone described in paragraph (2) to support the development by such eligible entities of—

(A) wells that reach supercritical temperatures;

(B) processes that bring supercritical fluids to the surface; and

(C) techniques to harness geothermal energy.

(2) PROGRAM MILESTONE.—A program milestone includes the following activities conducted with the use of a covered technology as part of a hot dry rock geothermal project:

(A) Drilling at different depths, temperatures, and pressures.

(B) Geothermal reservoir creation.

(C) Steam production (to measure well flow over time).

(D) Power production of increasing size.

(E) Other supporting activities, including—

(i) converting a coal plant to accept steam from a hot dry rock geothermal energy powerplant;

(ii) energy-based drilling for accessing depths, temperatures, and pressures previously inaccessible with conventional drilling technology; and

(iii) stimulation for hot dry rock reservoir creation.

(3) APPLICATIONS.—To be eligible for a grant under this subsection, an eligible entity shall submit to the Secretary an application in such form, at such time, and containing such information as the Secretary determines appropriate.

(4) COVERED TECHNOLOGY DEFINED.—In this subsection, the term ''covered technology'' means—

(A) a system for steerable drilling at temperatures and pressures relevant to geothermal energy production;

(B) a system for cost-effective and efficient thermoelectric conversion;

(C) a method for using working fluids other than water;

(D) a new method for casing wells, applicable to geothermal energy production;

(E) a system for deep drilling, including through basement rock;

(F) a method for geothermal reservoir creation in the brittle-ductile transition zone of the crust of the Earth;

(G) a method for increasing the surface area or heat transfer rate of a next-generation geothermal system; or

(H) any other technology determined necessary by the Secretary for achieving a program milestone described in paragraph (2).

(5) AUTHORIZATION OF APPROPRIATIONS.—There is authorized to be appropriated to the Secretary to carry out this subsection $30,000,000 for each of fiscal years 2027 through 2031.

(f) DEFINITIONS.—In this section:

(1) ELIGIBLE ENTITY.—The term ''eligible entity'' means—

(A) a National Laboratory;

(B) an institution of higher education (as such term is defined in section 102(a) of the Higher Education Act of 1965 (20 U.S.C. 1002(a)); or

(C) a private entity.

(2) PROPPANT.—The term ''proppant'' means particles mixed with fluids designed to keep an induced fracture open after stimulation.

(3) SECRETARY.—The term ''Secretary'' means the Secretary of Energy, acting through the Geothermal Technologies Office of the Department of Energy.

SEC. 4. HOT DRY ROCK GEOTHERMAL ENERGY RISK RESEARCH AND MONITORING.

(a) IN GENERAL.—Not later than 180 days after the date of the enactment of this section, the Secretary shall establish—

(1) a research program to study the—

(A) seismicity and rock mechanics in the brittle-ductile transition zone; and

(B) thermal property of rocks, including rock conductivity, fluid heat capacity, rock heat capacity, specific heat capacity, and seismicity, with an emphasis on the characterization impact of hot dry rock geothermal energy;

(2) a program to map deep basement rocks within each of the several States, the District of Columbia, and each territory and possession of the United States; and

(3) a program to monitor the ground water of areas in the United States affected by the testing and demonstration of technologies used in the development of hot dry rock geothermal energy.

(b) SECRETARY DEFINED.—In this section, the term ''Secretary'' means the Secretary of the Interior, acting through the Director of the United States Geological Survey.

(c) AUTHORIZATION OF APPROPRIATIONS.—There is authorized to be appropriated to the Secretary to carry out this section $5,000,000 for each of fiscal years 2027 through 2031.

SEC. 5. WORKFORCE CROSS-TRAINING PROGRAM.

(a) IN GENERAL.—The Secretary shall establish and carry out a workforce training program under which the Secretary shall enter into an agreement with at least 2 institutions of higher education (as such term is defined in section 102(a) of the Higher Education Act of 1965 (20 U.S.C. 1002(a)) to train covered individuals to work in the geothermal energy industry.

(b) PROGRAM REQUIREMENTS.—In carrying out the program established under subsection (a), the Secretary shall carry out the following activities:

(1) Offer classroom education, training, and apprenticeship placements to covered individuals with respect to the following areas:

(A) Geosciences.

(B) Geophysics.

(C) Computational sciences and engineering.

(D) Geological engineering.

(E) Mechanical engineering.

(F) Process engineering.

(G) Chemical engineering.

(H) Petroleum engineering.

(I) Drilling engineering.

(J) Civil engineering.

(K) Electrical engineering.

(2) Encourage participation by covered individuals who are members of—

(A) a union; or

(B) an energy community.

(c) PRIORITIZATION.—The Secretary shall prioritize the participation in the program established under subsection (a) of individuals who work in a role described in subsection (d)(1)(C).

(d) DEFINITIONS.—In this section:

(1) COVERED INDIVIDUAL.—The term ''covered individual'' means an individual who—

(A) is a citizen or legal permanent resident of the United States;

(B) is an employee of or works as an independent contractor for a company that is headquartered in the United States; and

(C) works, prior to or at the time of their enrollment in the program—

(i) in the oil and gas industry, including as—

(I) a mechanical engineer;

(II) a drilling engineer;

(III) a reservoir engineer;

(IV) a petroleum engineer;

(V) an electrical engineer;

(VI) an oil rig worker; or

(VII) a geoscientist; or

(ii) as a technician, including as—

(I) a welder;

(II) a machinist;

(III) a pipefitter; or

(IV) an electrician.

(2) ENERGY COMMUNITY.—The term ''energy community'' has the meaning given the term in sec-

tion 45(b)(11)(B) of the Internal Revenue Code of 1986.

(3) SECRETARY.—The term ''Secretary'' means the Secretary of Labor.

(e) AUTHORIZATION OF APPROPRIATIONS.—There is authorized to be appropriated to the Secretary to carry out this section $10,000,000 for each of fiscal years 2027 through 2031.

SEC. 6. STRENGTHENING FEDERAL AUTHORIZATION FOR HOT DRY ROCK GEOTHERMAL PROJECTS.

(a) HOT DRY ROCK GEOTHERMAL PROJECT EXPERT PROGRAM.—

(1) IN GENERAL.—The Secretary of Energy shall establish and carry out a program to provide to the regional and district offices of the Bureau of Land Management and the Forest Service technical assistance with respect to Federal authorizations for hot dry rock geothermal projects, including research and development related to hot dry rock geothermal projects.

(2) AUTHORIZATION OF APPROPRIATIONS.—There is authorized to be appropriated to the Secretary of Energy to carry out this subsection $10,000,000 for each of fiscal years 2027 through 2031.

(b) CATEGORICAL EXCLUSION FOR EXPLORATION AND CONFIRMATION OF HOT DRY ROCK GEOTHERMAL ENERGY.—Section 390 of the Energy Policy Act of 2005 (42 U.S.C. 15942) is amended—

(1) in subsection (a), by inserting ", or the Geothermal Steam Act of 1970 (30 U.S.C. 1001 et seq.) for the purpose of exploration of geothermal resources" after "or gas"; and

(2) in subsection (b)—

(A) in paragraph (2), by striking "or gas" and inserting ", gas, or geothermal"; and

(B) in paragraph (3), by striking "or gas" and inserting ", gas, or geothermal".

(c) DEFINITIONS.—In this section:

(1) EXPERT.—The term "expert" means an individual who works or has worked in the energy sector and has expertise in disciplines including—

(A) drilling and completion, including casing and well interventions;

(B) geothermal field operations;

(C) rock mechanics;

(D) geophysics;

(E) exploration technology; or

(F) downhole technology, including packers and wire line tools.

(2) FEDERAL AUTHORIZATION.—The term ''Federal authorization''—

(A) means any authorization required under Federal law with respect to an activity on the area of a lease issued under the Geothermal Steam Act of 1970 (30 U.S.C. 1001 et seq.); and

(B) includes any authorization for siting, drilling, underground injection, surface operations, and generation of energy under such a lease.