

**Statement of**  
**the U.S. Geological Survey (USGS), Department of the Interior**  
**on H.R. 8665, the Supercritical Geothermal Research and Development Act**  
**before the House Committee on Natural Resources, Subcommittee on Energy & Mineral Resources**

**July 23, 2024**

Chairman Stauber and Ranking Member Ocasio-Cortez, thank you for the opportunity to provide this statement on H.R. 8665 the Supercritical Geothermal Research and Development Act, 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.

**Background**

Geothermal energy is a significant source of renewable electric power in the western United States and, with advances in exploration and development technologies, a potential source of a large fraction of baseload electric power, heating, and cooling, for the entire country. A critical question for future energy planning is the extent to which geothermal resources can contribute to the increasing demand for low-carbon electricity.

The USGS has a long history of research and assessment of geothermal resources in the United States. Several laws have authorized the USGS to conduct regional and national appraisals of all types of viable geothermal resources. USGS national-scale assessments and supporting research studies provide State and Federal government policymakers with the information they need to evaluate the potential contribution of geothermal energy to the nation's energy portfolio. In response to the Geothermal Steam Act of 1970, the USGS identified known geothermal resource areas in 1971 and completed the first national-scale assessment of geothermal resources of the United States in 1975, followed by a second assessment in 1979. In response to the Energy Policy Act of 2005 and the Energy Independence and Security Act of 2007, the USGS produced an updated national geothermal energy assessment in 2008. The Energy Act of 2020 authorized new assessments to incorporate additional geothermal resource types across the entire United States, including Alaska, Hawaii, and Puerto Rico.

Supercritical resources are an emerging geothermal resource that involves drilling into super-hot (typically >370 °C or 700 °F) rock near active volcanic centers. While it is well known that the crystallization of magma chambers releases large amounts of energy at very high temperatures, a systematic method of harvesting this heat has not been developed. The most significant problems relate to effective targeting of supercritical temperatures in the subsurface to efficiently access the heat and developing tools and equipment that can work reliably at these high temperatures.

### **H.R. 8665**

H.R. 8665 amends 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. We have several comments for your consideration.

At Section 2, paragraph (a) (3) (D), we note that the USGS Energy Resources Program has a long-standing partnership with the Department of Energy's Geothermal Technologies Office. The partnership involves data collection and data interpretation including USGS Earth Mapping Resources Initiative (Earth MRI) collection of subsurface data essential to characterizing both geothermal resources and critical mineral resources. At present, the partnership leverages each agency's complementary skills, with the USGS providing geoscience data interpretation, research, and resource assessments, and DOE leading on the geothermal technology-related data. There would be additional costs and potential inefficiencies associated with moving toward a fully shared data model, including identification of key datasets, data formatting, and population of the drilling data repository with data from ongoing and completed mining, critical minerals, and energy projects. The USGS would not be able to complete this work with its current level of resources.

At paragraph (a) (3) (e), we note that the deepest geothermal exploratory wells have only recently (2023) reached depths of 5 kilometers, with 7 kilometers as a proposed current technological limit for conventional geothermal resource development. Geothermal resource development below this depth requires emerging technologies that have not at present achieved economic viability. Increasing drilling depth beyond 8 kilometers will be considerably more costly and will, for some geologic provinces, require continued advancements in drilling technologies (an ongoing research program by the DOE). The USGS would not be able to commission drilling of exploration boreholes to depths greater than 8 kilometers with its current level of resources.

At paragraph (b) (1) (A) (iv), we note that adding an additional assessment of supercritical geothermal resources is a significant expansion of scope of USGS's responsibilities and would require development of new assessment techniques. The USGS would not be able to complete this work in a timely fashion with its current level of resources.

At paragraph (b) (2), we note that it is not possible to complete an update to the National Geothermal Resource Assessment within 180 days after enactment of the bill into law. Since the enactment of the Energy Act of 2020, the USGS has been able to develop and apply assessment methods for two of the four geothermal assessment types envisioned under that law. A modest increase in funding, as requested in the FY2025 Budget, supports essential planning efforts and will allow the USGS to accelerate progress toward completing geothermal resource assessments for conventional hydrothermal, enhanced geothermal systems, low-temperature and underground thermal energy storage. Assessing potential for co-production of minerals and geothermal energy (per the Energy Act of 2020) will also occur. Quadrennial updates would be possible following completion of the first updated assessment.

The USGS appreciates Congressional interest in the expansion of geothermal assessments and the opportunity to provide these comments. We support the underlying goal of this legislation to promote research on supercritical geothermal systems. We would be happy, at your request, to provide briefings on current geothermal research and assessment activities conducted under our existing authorities and additional technical assistance in developing this bill.