LOTSIXTEEN

Committee: House Science, Space & Technology Subcommittee on Energy
Event: Subsurface Science and Technology: American Energy and Mineral Dominance
Date: April 16, 2026

Executive Summary:
Both Republicans and Democrats expressed support for efforts to expand research and development efforts for subsurface resource exploration. They also had substantive questions for the panelists on domestic geothermal and mineral production efforts, and the panelists discussed recent technology-specific innovations in these key industries.

Member Toplines:

Chair Randy Weber (R-TX-14):[1] Weber emphasized the importance of continued innovative investments and production supporting the development of subsurface resources like coal, natural gas, and geothermal energy. He contended that research from the oil and gas industry have reinvigorated the geothermal industry, and he argued that the commercialization of new geothermal energy technologies must occur rapidly. He discussed the recent establishment of two new Department of Energy (DOE) offices: Hydrocarbons and Geothermal Energy (HGeo), and Critical Minerals and Energy Innovation (CMEI). He also highlighted how recent geopolitical events have significantly impacted our energy sector, advocating for continued buildout of domestic energy resources to insulate the economy from international whims. He also emphasized the need to end our reliance on critical minerals imported from adversarial nations.

Ranking Member Deborah Ross (D-NC- 02): Ross discussed a recent CODEL she attended in Iceland to learn more about advanced geothermal energy technologies. She emphasized the longstanding research spearheaded by DOE and the National Laboratories into subsurface extraction efforts, as well as its environmental implications. She emphasized the importance of geothermal energy and critical minerals as "American-Made" alternatives to traditional energy resources and adversarial mineral supply chains, and she expressed interest in the extraction of critical mineral resources from unconventional materials. She concluded by emphasizing the importance of continued federal investment in subsurface research and development efforts.

Full Committee Chair Brian Babin (R-TX-36): Babin warned that competition with China in terms of subsurface science and technology continues to persist. He emphasized the need to establish a domestic critical minerals supply chain, as well as the need to increase energy production to support the buildout of domestic refining and processing capabilities. He emphasized the importance of rare earth elements for defense applications, and he praised DOE and National Science Foundation (NSF) research in support of domestic mineral supply chains. He also characterized enhanced geothermal energy production as a key source of baseload energy.

Witness Toplines:

[1] Opening statements were not available online at the time of this memo's distribution.

Carlos Araque, President and Chief Executive Officer, Quaise Energy: Araque contended that Quaise's super-hot geothermal energy is a key, innovative breakthrough for the subsurface energy industry. He claimed that this technology has the potential to significantly support baseload energy production, and he noted that super-hot geothermal energy can be unlocked at scale, regardless of geological conditions. He concluded by asking Congress to consider a rapid expansion of funding available to HGeo.

Dr. Elizabeth Holley, Professor, Mining Engineering, Colorado School of Mines: Holley emphasized the need for a national and proactive critical minerals strategy. She contended that an interdisciplinary approach to determine mineral supply pathways can help guide strategic investments in research and development efforts for each critical mineral. She contended that exploration efficiencies must be improved, including the work done by the Department of the Interior's (DOI) EarthMRI Program, and she argued that resource availability is constrained by external factors. She claimed that mine waste recovery efforts could largely supplement demand for many key critical minerals, but argued that the defunding of the Bureau of Mines has paused much of this key geometallurgy research. She also discussed the need for international investments in workforce development efforts.

Dr. Thomas A. Lograsso, Director, Critical Materials Innovation Hub (CMI), Ames National Laboratory: Lograsso emphasized the importance of the following pillars of CMI's research efforts: (1) diversifying supply; (2) identifying substitutes; (3) developing secondary sources; and (4) investing in recycling and enabling cross-research technoeconomic and supply chain analysis. He discussed CMI's recent efforts focused on lanmodulin use for rare earth element separation and extraction efforts, acid-free metal production, and acid-free recycling for end of life permanent magnets.

Joel Edwards, Co-Founder and Chief Technology Officer, Zanskar Geothermal & Minerals: Edwards discussed Zanskar's use of artificial intelligence (AI) technologies for geothermal and subsurface exploration applications. He argued that the thermal properties of many geologic materials are unexplored in the United States, and he argued that Zanskar's iterative process for geothermal discovery will help the U.S. emerge as a key leader in subsurface geothermal energy development.

Major Takeaways:

- Chair Weber asked Edwards about the impact of geothermal well management in high-humidity conditions. Edwards discussed Zanskar's chiller system, consisting of evaporators and wet-cool condensers, which are constructed to adapt to conditions with nearby water sources.
- While talking with Chair Weber, Araque noted the compatibility of Quaise's technology with oil and gas sources. He also discussed that Quaise is actively supporting workforce development efforts in Texas to share his company's expertise among the subsurface industry at large.
- Chair Weber asked the panel what priorities Congress should consider in terms of subsurface development; the panel noted that funding for research and AI applications are needed.

- Ranking Member Ross asked Holley to discuss the issue of workforce as it pertains to subsurface resource extraction efforts, as well as what role the government could play to support expanded workforce preparation efforts. Holley noted that there are no sustained, long-term funding sources for mining schools, especially for interagency efforts between DOI and DOE.
- Full Committee Chair Babin asked Holley to expand on her comments regarding efforts to systematically prioritize targeted mineral investments. She emphasized that different supply strategies are needed for each critical mineral, and she said that an overall understanding of the needed interventions would allow for accurate prioritization of action. He also discussed information collection efforts for geothermal energy production with Edwards, who emphasized that DOE could help fund larger data collection efforts.
- Rep. **Valerie Foushee** (D-NC-04) noted current projects at Duke University to identify innovative downstream mineral extraction efforts. Holley emphasized that the establishment of CMEI was a huge step in support of coordination efforts, but contended that continued interagency actions must be taken to expand resource access for subsurface researchers.
- Rep. **Pat Harrigan** (R-NC-10) discussed the national security implications of geothermal energy with Edwards.
    - Edwards noted Zanskar's partnership with the Department of War (DoW), specifically as it relates to utility-scale power resources within DoW operations out West. He said that discussions are currently underway about how to develop these energy projects alongside DoW operations.
- Rep. **Laura Friedman** (D-CA-30) discussed a recent offtake and geothermal exploration agreement between Zanskar and California Community Power (CC Power). She asked about how Zanskar's predicted output estimates have historically compared to actualized results.
    - Edwards noted that typically, the biggest driver of levelized costs for Zanskar's geothermal production is usually the time to bring power online via the permitting and leasing process. He stated that the agreement with CC Power is intended to expedite the process and ensure that any geothermal projects Zanskar develops are as cost-efficient for consumers as possible.
- Rep. **Jim Baird** (R-IN-04) asked Holley to discuss the most important research priorities the government should keep in mind for the development of subsurface resources. Holley noted that understanding the relationship and risk between localized drill holes will be critical for future development. She also noted that byproduct and mine waste recovery via investments in geometallurgical research would be timely.
    - Lograsso also emphasized that research into separation technologies continues to inhibit the development of widespread domestic supply chains for minerals.
    - Baird asked about the use of waste rock and tailings for critical mineral supplies; Holley emphasized that these must be explored further.
- Rep. **Christian Menefee** (D-TX-18) argued that the Administration's actions to cancel specific projects and dismantle research infrastructure that support U.S. energy production are contradictory to its declaration of an energy emergency.