Testimony of Sarah A. Jewett

Head of Strategy, Fervo Energy

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Chairman Lowenthal, Ranking Member Stauber, and Members of the House Natural Resources Committee Subcommittee on Energy and Mineral Resources, thank you for the opportunity to testify at today's hearing.

My name is Sarah Jewett, and I am Head of Strategy at Fervo Energy, a company that develops next-generation geothermal projects that can deliver 24/7 clean and reliable electricity drawn from the heat of the earth. I am testifying today on behalf of Geothermal Rising, the geothermal industry's leading advocacy group, where I serve as Chair of the Policy Committee.

Geothermal Rising's mission is to support the advancement of American-made geothermal energy, leveraging underground thermal resources to generate 24/7 clean power, creating well-paying jobs, and growing a key part of the strong and reliable grid of the future. Geothermal Rising has nearly ninety corporate members, representing eighteen states and the District of Columbia.

I'm grateful that the Committee has convened today in part to examine a critical albeit difficult issue: permitting for geothermal projects on federal lands.

We are in a period of extraordinary opportunity for American-made sources of clean and reliable electricity. In the face of steadily worsening climate change, demand for firm, affordable, zero-emissions power is soaring: individual states are seeking to bolster reliability, reduce costs, and meet aggressive clean energy targets; the Biden Administration has mandated that all federal facilities be powered by fifty percent firm, carbon emitting-free power by 2030; and corporations are voluntarily establishing 24/7 carbon-free electricity goals.

As a firm, clean source of power with a uniquely American-made supply chain, geothermal energy is incredibly well suited to meet this moment, and Fervo and other members of Geothermal Rising are working hard to match sudden increased demand. But these projects are difficult to build; drilling wells to access the earth's heat, building pipelines to transport hot fluid, and constructing large-scale power facilities at grid interconnection points that can effectively wheel power to demand centers requires a complex logistical coordination effort, a high degree of diverse specialty expertise, and a substantial amount of capital.

With much of the nation's quality geothermal resource existing under federal lands, the permitting process can be a key gating factor to the success of these developments. In order to facilitate widespread

geothermal deployment, we believe strongly that there are straightforward steps the federal government must take to increase the efficiency of geothermal permitting while still maintaining NEPA's strong framework of environmental safeguards for our public lands.

With this in mind, we applaud Representative Fulcher for his introduction of H.R.5350, the Enhancing Geothermal Production on Federal Lands Act. This legislation would take important steps to increase the efficiency of federal leasing and permitting for geothermal projects, bringing significant new clean and reliable power resources onto the grid and creating jobs across the country.

The Geothermal Industry Today

Utility-scale geothermal energy is produced by extracting heat from the earth and converting that heat into electricity. To develop this type of energy, we drill wells into the subsurface and use water to pull heat to the surface. This hot fluid is transported via pipeline to a nearby power facility where it spins a turbine to generate electricity. Because the earth's heat is constant, geothermal energy has the potential to provide zero-emission power to Americans round-the-clock and complement variable generation sources such as solar and wind.

In recent years, American ingenuity and technological innovation has expanded the potential of geothermal resources, vastly increasing its energy production capabilities and broadening project viability to previously inaccessible areas across the country.

The Department of Energy's (DOE) 2019 GeoVision report found that, with the right blend of federal incentives and regulatory enhancements, geothermal could provide over 120 GW of clean, 24/7 electricity by 2050, accounting for 20% of U.S. electricity supply. But in just the few short years since GeoVision's release, substantial technology transfer from the oil and gas industry combined with aggressive climate targets have expanded the potential of geothermal energy even further.

Market Drivers for Geothermal Energy

The industry is seeing increases in demand for firm, clean power from states, the federal government, corporations, and beyond.

Today, twenty-two U.S. states have 100% clean energy standards or emissions reductions policies in place.[1] This state activity has spurred an increased penetration of variable renewable energies (VREs) like wind and solar while simultaneously accelerating retirements of coal and natural gas facilities, putting grid resiliency at ever-mounting risk.

In 2021, the California Public Utility Commission (CPUC) set an incredible example of tackling this resiliency issue by releasing its renewable energy procurement plan requiring the state's load serving entities to procure 1,000 MW of firm, clean power with a capacity factor of at least 80% by 2026.[2] With

[1] https://www.cesa.org/projects/100-clean-energy-collaborative/guide/table-of-100-clean-energy-states/
[2] CPUC Press Release - June 24, 2021

its ability to produce 24/7, zero-emissions power, geothermal represents the ideal technology to meet this specific procurement goal, which would help catalyze significant growth of geothermal projects in California and neighboring states. This first-of-a-kind mandate is exactly the type of regulatory forcing function that is needed to ensure load serving entities are responsibly replacing firm fossil generation with firm clean power generation.

On December 8, 2021, President Biden signed Executive Order (EO) 14057: Catalyzing Clean Energy Industries and Jobs Through Federal Sustainability. The executive order directs the federal government to use its scale and procurement power to achieve 100% carbon pollution-free electricity (CFE) by 2030, at least half of which will be locally supplied clean energy to meet 24/7 demand. "24/7 carbon pollution-free electricity" is defined as carbon pollution-free electricity procured to match actual electricity consumption on an hourly basis and produced within the same regional grid where the energy is consumed. In conjunction with the EO, the Biden Administration released its Federal Sustainability Plan, specifically recognizing geothermal as an eligible technology.[3]

In addition to state and federal policy drivers, companies around the world are committing to 24/7 clean energy procurement. Last year, the United Nations, in partnership with industry, launched the 24/7 Carbon-Free Energy (CFE) Compact establishing a set of principles to fully decarbonize electricity consumption.[4] The CFE compact now has over 70 signatories, including U.S.-headquartered companies such as Google, Microsoft, Johnson Controls, and more. This global commitment to 24/7 carbon-free energy will continue to increase demand and drive down the cost of geothermal and other firm clean energy projects.

Job Creation

Geothermal technologies are advancing, technology transfer from the oil and gas industry is occurring rapidly, and public and private sector demand are here. With the right balance of federal policy and regulation, the geothermal industry could bring new projects online at an unprecedented pace, leading to massive job creation and widespread economic development to new areas of the country.

Today, geothermal energy only provides about 3,800 MW or 0.4% of the U.S.'s electricity. According to the U.S. Energy and Employment Report, the U.S. geothermal industry supports over 8,000 direct jobs, along with significant indirect and related jobs.[5] As our industry scales to supply 20% of U.S. electricity, job creation is expected to scale commensurately with the potential to create over 250,000 new jobs.

Importantly, geothermal projects create numerous positions that are accessible to hardworking Americans in the oil and gas and other sectors. Each one of these new projects will create positions for truckers, dirt movers, surveyors, oilfield equipment operators, geologists, drilling engineers, mechanical engineers, electrical engineers, and more, offering reliable and well-paying positions for people who want to join the clean energy economy with very little retraining.

[3] Federal Sustainability Plan
[4] https://www.un.org/en/energy-compacts/page/compact-247-carbon-free-energy
[5] U.S. Energy and Employment Report

The Geothermal Industry and Federal Permitting

Though over 90% of American geothermal resources exist underneath federally managed land, the federal permitting process presents one of the largest barriers to building new geothermal energy. The process of executing the environmental analyses and seeking multiple approvals required by the National Environmental Policy Act of 1969 (NEPA) to develop geothermal on public lands can take up to ten years (or more) and is lengthier and more prone to delay for geothermal than for other renewables or for oil and gas industry projects.

As an environmentalist and an outdoorswoman, I believe that renewable energy development on public lands should incorporate careful consideration of environmental impacts. However, the current process is replete with duplicative assessments and opaque, prolonged processing, making it difficult for developers like Fervo to plan, finance, and build projects effectively and thus inhibiting the growth of an industry that could contribute mightily to addressing climate change with American-made clean power. Across multiple critical phases of development, permitting and NEPA timelines are consistent bottlenecks and lacking in transparency, adding uncertainty to an already risk-laden process.

A 2014 National Renewable Energy Laboratory (NREL) study revealed that a single geothermal project could "conceivably trigger the NEPA process six separate times."[6] Similarly, GeoVision identified that new geothermal projects face seven- to ten-year project development timeframes, filled with a wide array of requirements for lengthy and complex environmental review.

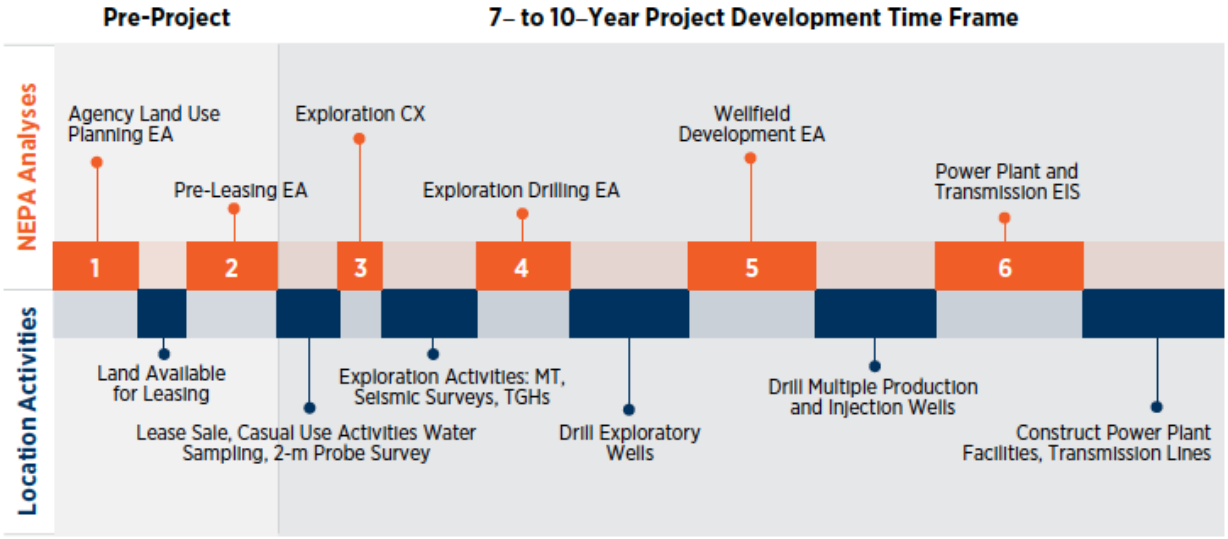

Figure 1: GeoVision: Harnessing the Heat Beneath Our Feet

To understand why this is the case, it is helpful to examine the purpose of geothermal exploration. Like any renewable energy project, geothermal energy developers require a certain set of conditions to build an economic and long-lasting system. Unlike solar and wind, whose conditions are easily observable above

[6] https://gdr.openei.org/files/1258/Geothermal%20Permitting%20and%20NEPA%20Timeline%20Analysis%20-%20FINAL.pdf

ground, the conditions required for a successful geothermal system exist thousands of feet below the surface of the earth in highly heterogeneous layers of rock. To assess the conditions present at any given point, a developer must either have data from a prior project or expend the resources to drill deep enough that they may find and extrapolate a reasonably representative set of conditions to greenlight project placement.

Given the high level of risk posed by resource- and time-intensive exploration drilling, it is imprudent to explore for geothermal reservoirs under the full burden of a NEPA assessment that covers the entire potential project. Thus, geothermal developers must often file multiple NEPA assessments for similar activities over the life of a single project.

H.R.5350: An Important Step Forward

In May, the Biden Administration released a Permitting Action Plan that stated that federal environmental reviews and permitting processes should be "effective, efficient, and transparent, guided by the best available science to promote positive environmental and community outcomes, and shaped by early and meaningful public engagement."[7]

For the reasons listed here, the Geothermal Energy industry wholeheartedly supports the President's sentiment. To that end, we have written letters to the administration recommending the following actions to enhance the efficiency of permitting geothermal projects on federal lands:

- Expanding the application of Casual Use Reviews, Determinations of NEPA Adequacy, and Categorical Exclusions (CX) in place of full Environmental Assessments (EAs) and Environmental Impact Statements (EISs)
- Increasing the transparency of permit tracking and agency delays
- Implementing programmatic EAs and EISs to increase the efficiency of the NEPA process
- Allowing the combination of environmental analyses for multiple phases of geothermal development

H.R. 5350, the Enhancing Geothermal Production on Federal Lands Act takes a logical and helpful step to ease the permitting burden on low-impact geothermal exploration test projects through implementation of a categorical exclusion and foster efficiency by expanding the use of geothermal priority leasing areas.

Section 390 of the Environmental Policy Act of 2005 approved CXs for the oil and gas industry that are often credited for fostering an extremely productive feedback loop between exploration, development, and deployment of unconventional shale resources. H.R. 5350 could help create a similarly productive feedback loop for firm, clean geothermal power. The proposed CX would accelerate a developer's ability to drill slim, low-impact boreholes to confirm temperature resources, more quickly unlocking project feasibility and laying the groundwork for comprehensive environmental assessment. The proposed priority leasing areas would build the foundation to execute upon more effective, efficient, and transparent permitting processes in lands previously screened for targeted development.

[7] https://www.whitehouse.gov/wp-content/uploads/2022/05/Biden-Harris-Permitting-Action-Plan.pdf

Ultimately, permitting for geothermal energy projects is a complex topic, affecting multiple agencies and stakeholders across every level of government and beyond. H.R.5350 is a thoughtful and productive piece of legislation that would take important steps to address key permitting issues. Beyond H.R.5350, there remain many barriers associated with permitting that the Committee's important work here and over the coming months can help resolve to boost an industry that is ready to scale, providing clean power and well-paying jobs across America. We look forward to working with you on this topic.

Thank you again for the opportunity to testify, and I look forward to answering your questions.