

**BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF CALIFORNIA**

Order Instituting Rulemaking to Continue Electric Integrated Resource Planning and Related Procurement Processes.	Rulemaking 20-05-003 (Filed May 7, 2020)
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**GEOHERMAL RISING REPLY COMMENTS ON ADMINISTRATIVE LAW JUDGE'S
RULING SEEKING FEEDBACK ON MID-TERM RELIABILITY ANALYSIS AND
PROPOSED PROCUREMENT REQUIREMENTS**

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Pursuant to Rule 14.3 of the Rules of Practice and Procedure of the California Public Utilities Commission (“Commission”), Geothermal Rising (“GR”) hereby submits these reply comments on the February 22, 2021 Administrative Law Judge Ruling seeking feedback on Mid-Term Reliability Analysis and Proposed Procurement Requirements (“Ruling”), noting that a subsequent ALJ Ruling issued on March 17, 2021 revised the due date for reply comments from April 2, 2021 to April 9, 2021.

Introduction and Summary

Substantial comments were submitted regarding the viability and reasonableness of the proposed procurement of 1,000 MW of geothermal resources in the mid-term. GR has identified and responds to the following issues:

- Perceived lack of Geothermal in the interconnection queue
- Transmission availability to deliver new capacity
- Appropriateness of technological specification
- Perceived “Lumpiness” of geothermal development

- Potential market power of geothermal developers

Lack of Geothermal in Interconnection Queue

Collectively, there is currently over 1 GW of additional geothermal capacity in the NV Energy (580 MW) and the Imperial Irrigation District's (525 MW) interconnection queues that is capable of delivering into the CAISO. While the CAISO does not currently include geothermal projects in its active interconnection queue, several projects will be participating in the currently open Cluster 14 process. There are also existing under-producing geothermal wells that can potentially be retrofit in 7-18 months from project inception to add to California's generating capacity at competitive prices, provided that there is line-of-sight to market access.

In addition, GR is actively engaged with the new federal administration, collaboratively building solutions to streamline and expedite the permitting and interconnection processes, which has been significantly lengthier for geothermal than for other renewables, or even for oil and gas industry projects. With promising interconnection expansion, enthusiasm and stated commitment from the federal administration to shorten permitting processes, and relatively short construction timelines of geothermal facilities ranging from twelve to eighteen months, GR is confident that the geothermal industry will meet the target of 1 GW of additional geothermal capacity by 2025 set by the CPUC in this proposed ruling. Because geothermal plants are long-lived, 24/7 available and renewable they will help California replace the lost system diversity and GHG-free generation when Diablo Canyon retires. New geothermal capacity has the smallest lifecycle environmental impacts of all generation resources and will continue to provide clean energy to the Western grid for many decades.

Transmission Availability

A significant portion of the geothermal projects currently under development are located in Nevada. As Gridliance West noted in its comments, it has transmission upgrades under development that would facilitate delivering additional geothermal resource capacity into the CAISO. The CAISO TPP also includes 651 MW of new geothermal capacity in its Final Study Plan for its 2021-2022 Transmission Planning process, incorporating the portfolios submitted by the CPUC in D.21-02-008¹. The CAISO assessment will determine what, if any, transmission upgrades will be needed to incorporate the geothermal capacity as a part of the reference system portfolio. If the mid-term procurement of 1,000 MW of geothermal capacity is not adopted and incorporated as a revision to the CAISO Final Study Plan, there is a risk that the transmission upgrades identified in the 2021-2022 TPP will not be sufficient to meet the procurement requirement of 1,000 MW. Once the proposed procurement requirement is adopted, it would be prudent to suggest that the CAISO update its Final Study Plan to include the revised portfolios, including 350 MW to 500 MW of new geothermal capacity from Western Nevada, so the transmission infrastructure and TPP process can address any potential concerns in a timely manner.

Appropriateness of Technological Specification

The Ruling is specifically concerned with replacing the 2,200 MW of baseload capacity being lost with the retirement of the Diablo Canyon Nuclear power plant (DCPP). It recognizes

¹ 600 MW connecting to the CAISO at the IID Bannister Substation and 51 MW in the Solano/Sacramento River area connecting to the Sonoma 3 230 kV system.

the value of having a resource that is not weather dependent and is able to operate continuously by specifying the need for 1,000 MW of geothermal. To reflect changing grid conditions, it also includes 1,000 MW of long duration energy storage (LDES) so that the combined replacement capacity is comparable to DCPD while combining base reliability and the ability to mitigate oversupply concerns. Several parties argue in their comments that the generating characteristics should be provided to the Load Serving Entities rather than a mandated generation type. They argue that other renewable sources such as biomass and additional LDES can provide the same level of dependable availability and should be considered to further enhance achieving these objectives and promoting resource diversity.

However, California Energy Storage Alliance's suggestion to allow LDES with unproven duty cycles, lifetimes and lifecycle impacts to substitute for geothermal is not well founded. While eight hours of storage discharge capacity is certainly an improvement over the current four-hour resource adequacy standard, even LDES requires actual generation to charge it. Geothermal resources can and do generate continuously while providing resource diversity beyond variable renewable resources.

It is now widely known that California has a Resource Adequacy problem. Regulators have an obligation to plan for foreseeable events with significant effects. These include common events, such as the sun setting every day, and rare, but nevertheless, foreseeable natural hazards that could shut down the entire grid, such as future volcanic activity or extreme weather that obscure the sun globally for long periods of time. Furthermore, while GR advocates for the value of geothermal as a firm, reliable renewable resource, most binary cycle geothermal power plants built in the last decade have flexible capabilities that can support variable load. This

flexibility provides an even stronger case for the mandated procurement of significant new geothermal resources.

Additionally, federal support for geothermal research, exploration and development and the sector generally, including exploration, has been accelerating. There is a national opportunity for assisting the oil and gas exploration industry transition in part to geothermal exploration and development. Further, due to compatibility of skills, the geothermal sector is unique in its ability to support the just transition of jobs and economic activity from the legacy oil and gas sector, to the clean and low carbon energy future. If the CPUC retains its proposed requirement for geothermal, it will give added policy support to these initiatives. The potential is significant.

Perceived “Lumpiness” of Geothermal Resources

One environmental benefit of geothermal generating plants is its relatively small footprint for incremental additions to generating capacity. The 24 geothermal units listed on the CAISO’s 2021 NQC report have a total August Qualifying Capacity of 1061.8 MW, averaging 44.24 MW each. Furthermore, most of the geothermal projects listed in the NV Energy queue are under 40 MW. Geothermal requires less land area for construction and, because of its high availability (87-95%) and high capacity factors, can provide more clean energy (MWh) per MW of capacity than intermittent resources. It simply makes sense to add generation capacity with availability in the neighborhood of 90%, rather than generation with availability in the neighborhood of 30%.

Potential Market Power

GR has a membership list of over 60 entities in the geothermal industry who can demonstrate that although geothermal energy isn't produced today as widely as solar or wind, there is a large presence for geothermal to mitigate market power and enhance grid diversity. In addition, geothermal plants provide more jobs/MW than solar or wind. For example, BHE Renewables owns and operates 579 MW of solar power plants with 6 FTE employees. It also owns 10 geothermal plants with 350 MW capacity operated by 225 employees. While solar plants can pay no property taxes, these 10 geothermal plants paid \$45 million in property taxes in just the last 8 years.

Conclusion

GR is confident that development of 1,000 MW of geothermal power by 2025 is feasible based on existing capacity coming out of contract, and projects currently in the exploration and development pipeline. Enhanced tax incentives included in proposed GREEN Act language, recent shifts in the recognition and knowledge of geothermal's proven attributes in the regulatory landscape, and engagement with the Secretary of Interior's office to streamline the permitting process, all provide increasing assurance to the industry that 1,000 MW of procurement by the CPUC is achievable. To make this possible, immediate action by the CAISO is essential, in order to increase transmission support in tandem with procurement mandates that will ensure commercial viability of LSE contracts for geothermal capacity and energy.

Respectfully submitted April 9, 2021 at Sacramento, California.

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