

**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 COMMENTS ON ADMINISTRATIVE LAW JUDGE'S
RULING SEEKING FEEDBACK ON MID-TERM RELIABILITY ANALYSIS AND
PROPOSED PROCUREMENT REQUIREMENTS**

Will Pettitt, PhD, FGS
Executive Director
GEOHERMAL RISING
1121 L Street, Suite 700
Sacramento, CA 95814
Phone: 651-808-4463
Email: wpettitt@geothermal.org

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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 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 comments from March 19, 2021 to March 26, 2021.

Introduction and Summary

The Geothermal Rising (GR), formerly the Geothermal Resources Council (GRC), is the world’s largest non-profit professional and trade association for the geothermal industry and community, serving the USA and with an international footprint. We champion the Earth’s clean and renewable power source that’s always available 24/7 beneath our feet. We were founded in 1972 and are registered in California.

GR is pleased to submit these comments in response to the February 22, 2021 ruling seeking feedback on mid-term reliability analysis and proposed procurement requirements issued by

Administrative Law Judge Fitch. The ruling makes substantial progress in recognizing the value that additional geothermal resources can provide in enhancing the diversity of low-carbon resources needed to replace the retiring Diablo Canyon Nuclear Plant while maintaining grid reliability throughout the region. As a baseload resource, independent of weather variability or climate changes, geothermal is well suited to help replace Diablo Canyon. Its geographic diversity throughout California and adjacent states provides the added benefit of not being concentrated at a single location subject to a single point of failure. Geothermal is also likely to play a significant role in the anticipated development of California's lithium resources anticipated in the AB 1657 authorization of the recently convened Lithium Valley Commission. These comments will focus on issues related to the viability and availability of geothermal to provide at least the 1,000 MW of capacity recommended. While these comments only address some of the questions raised on the Ruling, GR reserves the right to address others in its reply comments.

Specific Comments

Question 10: The process of identifying resource types and amounts that are cost-effective, and can potentially fulfill a procurement need, but have market or other barriers to procurement, is explored in Section 6.5.4 of the Procurement Framework Staff Proposal. Comment on the approach described in this ruling, with reference to the Staff Proposal and/or other approaches you recommend.

GR appreciates the opportunity to provide input on the perceived barriers to developing 1,000 MW of new geothermal resource capacity in the mid-term. The first perceived barrier is resource availability. While today California geothermal power plants boast a combined total capacity of just over 1,800 MW, accounting for 6% of the state's utility-scale generation, these plants draw from a small fraction of California's available geothermal resource.¹ The U.S. Geological Survey predicts a mean total of 64,844 MW of geothermal power-generation potential from hydrothermal and enhanced geothermal

¹ EIA California State Energy Profile (<https://www.eia.gov/state/print.php?sid=CA>)

systems with a 95% probability of at least 37,978 MW and a 5% probability of up to 102,321 MW of power-generation potential *in California alone*.² Thus, resource availability alone simply should not be considered a limiting factor for geothermal energy development.

A second perceived barrier is cost. Indeed, nine new long-term geothermal PPA's have been enacted in the past eighteen months at an average price of over \$70/MWh.³ There are two things to note when thinking about this cost. First, geothermal energy has been largely left out of incentives granted to other renewable industries, so while those incentives have facilitated large-scale cost reductions in wind and solar, the cost to produce geothermal energy has remained the same. This is changing rapidly as the geothermal industry embraces both a more favorable regulatory environment and widespread productivity increases in drilling and completions that are transferring over from the oil and gas industry. Federal tax policies are also increasingly favorable to geothermal, and in fact the proposed provisions in Congress's GREEN Act pertaining to geothermal support a PTC extension through the end of 2021, an ITC extension of 30% through the end of 2026 (with subsequent incentives of 26% in 2026, 22% in 2027, and 10% thereafter), and an 85% direct pay optionality for either PTC or ITC.

Another consideration regarding the perceived barrier of cost is that as a 24/7, flexible resource, geothermal energy provides significant value to justify a premium to intermittent resources. In a 2017 study on the comparative value of geothermal energy, it was found that energy value, capacity value, and potential value associated with flexibility and resource diversity should drive a value difference of at least \$37/MWh more than solar PV.⁴

² USGS Assessment of Moderate- and High-Temperature Geothermal Resources of the United States (<https://pubs.usgs.gov/fs/2008/3082/pdf/fs2008-3082.pdf>)

³ Geothermal Power Purchase Agreements on the Rise (<https://www.geothermal-library.org/index.php?mode=pubs&action=view&record=1040017>)

⁴ The Increasing Comparative Value of Geothermal—New Market Findings and Research Needs (<http://pubs.geothermal-library.org/lib/grc/1033898.pdf>)

Because of these perceived barriers, GR supports Option 1 of the Section 6.5.4 Procurement Framework Staff Proposal and believes that the proposed sensitivity analysis would incorporate *at least* the amount of geothermal energy that has been suggested by the mid-term reliability analysis and proposed procurement requirements ruling. GR would be happy to field information on current industry conditions to confirm key assumptions related to geothermal energy.

Question 11: Comment on whether the suggested amount of geothermal and/or long-duration storage resources should be required to be procured as part of the mid-term procurement requirements

The target amount of 1,000 MW of new geothermal energy should be required to be procured as part of the mid-term procurement requirements. In the wake of California’s 2020 rolling blackouts, Governor Newsom urged the energy regulators to “do more to ensure reliable service and to safeguard California’s energy future.”⁵ The geothermal energy industry stands ready to contribute hundreds of megawatts of reliable renewable energy to foster the resiliency of California’s grid. The Salton Sea alone, through expansion of existing geothermal projects and accelerated development of new target projects, could easily provide up to 700 MW of new capacity over the next five years. Expansion and further development of existing geothermal resources in Western Nevada also offers an estimated 350 MW of near-term potential to meet an ambitious procurement target. The 2019 Department of Energy GeoVision Report shows that even in a scenario with no technology improvement, an improved regulatory environment could double installed geothermal capacity by 2025. In order to show support of this ruling,

⁵ Geothermal Industry Responds to California Governor’s Call to Action for Reliable Energy (https://www.prweb.com/releases/geothermal_industry_responds_to_california_governors_call_to_action_for_reliable_energy/prweb17345951.htm#:~:text=Governor%20Newsom%20urged%20the%20energy,for%20reliable%20power%20that%20California)

several GR member companies have submitted new requests into the CAISO's Interconnection Cluster 14 for resources in both California and Nevada.

Question 12: Describe the risks you see, if any, in relying on specific resource types to fill the proposed procurement need, as well as provide suggestions for how they could be mitigated. For example, there could be some type of identified future juncture where LSEs and/or the Commission could evaluate risks prior to moving forward fully with procurement. As part of this, describe any challenges you see (for example, supply chain issues, siting challenges) that may impact the ability to come online with the timing and amounts proposed.

Long permitting timelines have historically posed a challenge to geothermal development on public lands. Based on assessments provided by its member companies, and recent action taken by GR with the new federal administration, we are confident that meeting the 2025 schedule, is feasible. President Biden's January 27 Executive Order on Tackling the Climate Crisis at Home and Abroad ordered creation of a National Climate Task Force, to be chaired by the National Climate Advisor. Part II, Section 207 of that Executive Order states that the Secretary of the Interior shall review siting and permitting processes on public lands to identify to the Task Force steps that can be taken, consistent with applicable law, to increase renewable energy production on those lands. GR immediately engaged with the Secretary of Interior's office to provide feedback outlining solutions to streamlining of the permitting process, and we continue to have a dialogue on this subject.

The primary issue facing developments of projects outside of the CAISO BA is the availability of sufficient transmission capacity in delivering new geothermal capacity, particularly from Western Nevada, Utah and the Imperial Valley, to meet the 2025 schedule. To address that issue, GR strongly encourages the Commission to revise its base TPP portfolio to include a near-term total of at least 1,000 MW of geothermal from Southern Nevada, Utah or Imperial Valley to determine if any upgrades would be required to deliver that capacity to serve California load. We note that as a baseload resource,

geothermal can deliver substantially more energy per MW of connected capacity than intermittent resources and thus require less incremental transmission capacity to do so.

In particular, it is important that the CAISO's Maximum Import Capability process be reformed to facilitate delivery from new geothermal resources from outside CAISO. LSE's that are making long-term commitments to new resources should be assured that needed deliverability will be available to them for the term of the procurement.

GR also supports the comments submitted by Gridliance West regarding geothermal procurement as a means to satisfy grid reliability, and the need for additional transmission for the delivery of capacity from out the CAISO BA. Gridliance encourages the CAISO to study the feasibility of higher levels of and more diverse presumed geothermal sourcing to ensure prudent planning that will keep LSE costs reasonable. Gridliance also recommends in their comments that the CAISO revise the base TPP portfolio to include an additional 500 MWs of geothermal resource buildout in Nevada, directly connecting to the CAISO grid as a means to overcome the burden that LSEs face when importing capacity from some areas.

Question 13: Comment on the proposal for all LSEs to engage in joint procurement of geothermal and/or long-duration storage, with the potential for IOUs to be required to backstop such procurement. This suggestion corresponds to Section 7.2.2 of the Procurement Framework Staff Proposal. If you have an alternative proposal, describe it in detail and/or identify whether it is one of the other options included in the Procurement Framework Staff Proposal. In addition, comment on whether identifying need for backstop procurement in 2023 would allow sufficient time to contract for and build these resources by 2025, and, if not, how you would propose to address this timing issue.

One of the prime advantages of geothermal energy is that it can be, and usually is, developed in smaller increments and is therefore a more suitable procurement option for multiple LSEs to meet their requirements. The diverse geography of development across California and adjacent states also lends itself well to increased reliability on the grid, as there is no single point of failure. GR is confident that the 2025 procurement date is feasible in large part because of the versatility afforded by the development

of smaller increments by several developers. In addition, given GR's engagement with the federal administration on permit streamlining, the shift to more favorable regulatory policies, and the tax incentives afforded to geothermal under new legislative policy, GR is confident that the industry will meet, and likely exceed, the 1,000 MW of procurement called for in the proposed ruling by 2025.

Question 15: Comment on whether firm imports should be allowed to count towards the required capacity proposed in this ruling, and if such resources should be required to be committed to California via pseudo-ties or dynamic scheduling. Include any other limitations you would propose.

There is no question that imports from specific geothermal imports should be able to count toward the proposed capacity, particularly considering that most of the potential mid-term geothermal capacity available is located outside the CAISO. Some form of firm transmission access to deliver to the CAISO will be needed as well as deliverability over the CAISO. Whereas the existing RA framework can include pseudo-ties or dynamic scheduling, as a base load resource, this should not be a requirement. Resource-specific RA capacity for imports is a part of the CAISO Resource Adequacy Enhancements and should be consistent with any reforms adopted by the Commission.

Question 20: If the IOUs are required to act as central procurement entities, for geothermal, long-duration storage, or backstop procurement in general, what requirements should be associated with the operating arrangements for those resources? Comment on issues and options explored in Section 7.2 of the Procurement Framework Staff Proposal.

Due to the potential for multiple smaller geothermal facilities, primarily located outside Local Capacity Areas, LSE self-procurement would appear to be the most reasonable mechanism for geothermal procurement. While some geothermal resources could be designed to be dispatched to track load,

geothermal is primarily a baseload resource with a high (>90%)⁶ capacity factor that would be scheduled 24/7 year-round. As such, operating arrangements would appear to be very straightforward and not require special arrangements.

Question 23: Comment on the approval process that should be used for the IOU procurement that would be required as suggested in this ruling, which corresponds to “Procurement Approval – Option 2” in Section 8.2 of the Procurement Framework Staff Proposal. If you have an alternative proposal, describe it in detail and/or identify whether it is one of the other options included in the Staff Proposal.

Use of Tier 3 Advice Letters for IOU procurement in accordance with IRP procurement requirements would appear to GR to be the most straightforward approach. This is particularly true considering that the procurement obligation will have been litigated through the IRP process, which offers ample opportunity for stakeholder review/participation.

⁶ Geo Vision report, Section 2.3.3.1

Conclusion

GR is confident that development of 1,000 MW of geothermal 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 favorability for geothermal in the regulatory landscape, and engagement with the Secretary of Interior's office to streamline the permitting process provide increasing assurance to the industry that 1,000 MW of procurement by the CPUC is not only achievable but will need immediate action from the CAISO to increase transmission support in tandem with procurement to ensure commercial viability for LSEs. GR submits these comments for consideration.

Respectfully submitted March 26, 2021 at Sacramento, California.

/s/ Will Pettitt
Will Pettitt, PhD, FGS
Executive Director
GEOHERMAL RISING
1121 L Street, Suite 700
Sacramento, CA 95814
Phone: 651-808-4463
Email: wpettitt@geothermal.org