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Sonoma Clean Power Comments on IEPR Commissioner Two-Day Workshop on California's Geothermal Energy Resources

Additional submitted attachment is included below.



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July 23, 2026

California Energy Commission
Docket Unit: MS-4
Docket No. 26-IEPR-04 (Geothermal)
715 P Street,
Sacramento, CA 95814

RE: Sonoma Clean Power Comments on Integrated Energy Policy Report Commissioner Two-Day Workshop on California's Geothermal Energy Resources

Dear Vice Chair Gunda, Commissioner Gallardo, and Commission Staff:

Sonoma Clean Power Authority (SCP) appreciates the opportunity to provide these comments to the California Energy Commission (CEC) in response to the Integrated Energy Policy Report (IEPR) Commissioner Two-Day Workshop on California's Geothermal Energy Resources. This focused workshop provided an invaluable opportunity to examine this resource in depth and evaluate both the challenges and opportunities associated with in-state geothermal development and its future role in providing reliable, affordable, and clean energy throughout California.

SCP is the public power provider for Sonoma and Mendocino Counties, serving approximately a half million residents and businesses. SCP has consistently supported progressive clean energy policy that enables rapid decarbonization while maintaining ratepayer affordability and grid reliability. We are committed to expanding the clean firm resource portfolio beyond our region to enable California to meet its Senate Bill (SB) 100, SB 1020, and climate targets. Since 2014, SCP has operated its EverGreen tariff, which is currently the only 100% 24/7 renewable service in California sourced entirely from within its service area; this unique service is possible due to the unique geothermal resources in our region.

SCP has played a leading role in supporting in-state geothermal development over the past several years. The value proposition of next-generation geothermal resources motivated SCP to develop a strategic initiative that leverages public-private partnerships to expand geothermal development opportunities in Sonoma and Mendocino Counties. In October 2021, SCP launched its Geothermal Opportunity Zone (GeoZone) to leverage its interest in off-taking geothermal power, community relationships, and advocacy experience to attract geothermal industry partners with next-generation geothermal expertise and an interest in local development.

SCP sees excellent alignment between topics raised in the 2026 IEPR and the challenges observed within the industry. We are excited by the conversations facilitated throughout the workshop and believe that the 2026 IEPR Update is an ideal vehicle to identify practical policy recommendations that increase investment in in-state geothermal development and expand access to the affordable clean firm capacity that is essential to achieving California's climate and energy goals.

It is our hope that SCP may continue to serve as a resource for the CEC and state agency partners as this work continues to develop. It is in this spirit that SCP respectfully offers the following comments to build upon the breadth of material shared during the workshop:

I. Resource Planning, Modeling, and Grid Integration

California's modeling of in-state geothermal resources should better capture their value in reducing risks associated with achieving the state's 2045 targets.

In its presentation on the potential scale and benefit of in-state geothermal resources, Clean Air Task Force (CATF) demonstrated that enhanced geothermal systems (EGS) have the potential to reduce electricity supply costs by \$10-44 billion versus a system without clean firm capacity. The results shared through the CEC's modeling similarly show a need for the clean firm capacity that geothermal resources provide. In assessing future resource portfolios, California agencies should evaluate not only the direct economic value of geothermal resources, but also their ability to mitigate key risks associated with achieving the state's 2045 targets.

In addition to the cost savings benefits, CATF highlighted that clean firm capacity reduces the required buildout rate of clean energy from 10 gigawatts per year to 3 gigawatts per year. In-state availability of EGS provides the additional benefit of reducing interregional transmission needs by 10 GW. Given the growing challenges associated with transmission development and interconnection availability, these benefits not only reduce system costs but also improve the feasibility, reliability, and affordability of California's pathway to achieving its 2045 targets.

California should improve characterization of near-field next-generation geothermal resources to better inform transmission planning.

As highlighted in CATF's presentation, California is expected to have significant near-field next-generation geothermal capacity that will offer the lowest costs for delivering clean firm capacity. In its own presentation, SCP stressed that although next-generation geothermal siting is more flexible, the best opportunities will be locationally constrained and accordingly require proactive transmission planning.

All of the active next-generation geothermal projects SCP has tracked in-state to date are located near known geothermal resources. While significant progress has been made, additional characterization of these opportunities would provide a stronger foundation for transmission planning, procurement modeling, and investment decisions. As an example, the

California Public Utilities Commission (CPUC) simply uses the heuristic that near-field next-generation geothermal opportunities double the hydrothermal capacity.¹

As a means of directly supporting characterization efforts, SCP has partnered with the County of Sonoma to improve the resolution of modeling in the Sonoma-Lake-Mendocino region with National Lab of the Rockies (NLR); this project originates from a Geothermal Grant and Loan Program award administered by the CEC, and results and findings will be made available to the CEC and the public.

Results of this research will not only improve the fidelity of temperature modeling but also seek to characterize other geologic features impacting next-generation feasibility such as depth of basement rock, faults and seismicity risk, and surface constraints. The CEC should seek to develop a parallel effort in partnership with other agencies, research institutions and industry, to evaluate resources throughout California. As discussed in more detail below, it will also be important for the State to complement improved modeling with direct investments in data acquisition, including cost-sharing in drilling exploration and appraisal wells that can serve as a catalyst for investment.

These activities are increasingly time-sensitive, as transmission upgrades can require more than a decade to complete. Improving understanding of future geothermal development opportunities today will help ensure that California's infrastructure investments align with future resource needs.

California should prioritize transmission planning assumptions that align with commercially viable geothermal development opportunities.

A related planning challenge identified during the workshop is observed in the State's busbar mapping process, where, as an example, the CPUC will relocate geothermal projects to areas of the grid with existing capacity rather than aligning mapping with commercial viability. Unlike solar and storage projects, it's not possible for high-quality geothermal projects to relocate to areas with existing transmission capacity.

Even with the improved characterization recommended above, it will also be difficult for modeling to capture the full range of conditions that drive project viability. Ultimately, active project development activity by industry will be the best indicator of where and when transmission capacity is needed. To meaningfully address this issue, California should prioritize busbar mapping assumptions that align closely with demonstrated commercial interest and development activity.

Because of changes in the California Independent System Operator's (CAISO) interconnection process, the queue struggles to serve as an effective gauge of development interest. Instead,

¹ See page 69 of California Public Utilities Commission, *Inputs & Assumptions: 2024-2026 Integrated Resource Planning (IRP)* (February 2026), accessed July 23, 2026, https://www.cpuc.ca.gov/-/media/cpuc-website/divisions/energy-division/documents/integrated-resource-plan-and-long-term-procurement-plan/2024-2026-irp-cycle-events-and-materials/2025_inputs_and_assumptions_report_20260210.pdf

the CPUC should facilitate a survey of geothermal developers to collect data on projects, including data on site control, subsurface appraisal risks, permitting status, financing status and commercial status. The results of this survey should heavily influence the mapping of transmission needs, to ensure that capacity is built where it will be effectively used by industry.

California should recognize the compliance and reliability value provided by energy-only geothermal resources.

A key barrier to geothermal development in California is the lack of transmission plan deliverability (TPD) in areas with significant geothermal potential. Without TPD available, projects seeking deliverability are not allowed to enter the queue unless they pursue interconnection as energy-only. However, the CPUC does not recognize compliance value in its Resource Adequacy (RA) or Integrated Resource Plan (IRP) programs for energy-only resources, which makes them un-contractable.

Given that deliverability is currently a function of summer peak grid conditions, limiting compliance recognition to resources with TPD undervalues the unique reliability benefits geothermal resources provide, which are chiefly through providing around-the-clock and intra-seasonal firm energy that will be key factors in enabling retirement of natural gas. Expanding eligibility for compliance as proposed is also not without precedent; for the mid-term procurement order, the CPUC allowed import resources to count for IRP compliance without maximum import capability (MIC) as long as load serving entities made good faith efforts to secure it,² which is analogous to projects being developed as energy-only with the intent of pursuing deliverability after startup. There are also proposals in the RA proceeding to allow energy-only resources to contribute charging energy to fully deliverable battery storage systems, which could significantly increase the compliance value of energy-only geothermal.

Energy-only interconnection has another important benefit, in that the scope of transmission upgrades required for interconnection is limited to stability needs and does not include thermal overloads. This reduces the cost and schedule risk for interconnection. From a planning perspective, it also avoids requiring front-end load transmission investments that may not be needed if a project is not developed (which is a higher probability with long-lead resources, particularly geothermal). Instead, accessibility and timing of interconnection can be prioritized (which is important for de-risking investment), and if necessary additional grid needs can be resolved through economic or policy transmission projects following commissioning.

CPUC and CAISO should additionally explore opportunities to provide greater certainty regarding a pathway from energy-only interconnection to fully deliverable status for geothermal projects aligning with the state's resource planning objectives. Despite their contracting risk due to the lack of compliance recognition described above, SCP is aware of several geothermal

² See Ordering Paragraph 12 of California Public Utilities Commission, *Decision 23-02-040: Ordering Supplemental Mid-Term Reliability Procurement (2026–2027) and Transmitting Electric Resource Portfolios to California Independent System Operator for 2023–2024 Transmission Planning Process*, Rulemaking 20-05-003 (February 23, 2023), <https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M502/K956/502956567.PDF>

projects that are considering entering Cluster 16 as energy-only (because there is insufficient TPD to enter as deliverable) in areas that are strongly aligned with the CPUC's planning portfolio.

Although this allows developers to begin an assessment of their interconnection needs, it is unlikely that they'll be able to be contracted and financed as energy-only under today's compliance rules. Given their alignment with state policy needs, the CPUC and CAISO could approve the projects needed to make these projects deliverable, reserve that deliverability, and allow them to receive that status at startup. This approach would avoid causing unnecessary delays that could ultimately risk project success and drive investment out of the state.

II. Data, Exploration, and Early-Stage Project Development

SCP strongly supports the proposed California Geothermal Data Collaborative.

SCP enthusiastically supports the California Geothermal Data Collaborative proposed in the California Geologic Survey's presentation. Increasing accessibility to well data, geophysical data, and other records can dramatically lower the burden for industry to evaluate opportunities for investment in California.

Additionally, identifying data gaps can prioritize "low hanging fruit" opportunities for data collection in California, such as the Nevada Play Fairway project shared in the presentation. Existing data accessibility challenges continue to create unnecessary barriers for project evaluation and investment. Many records are not digitized, and well data from the California Geologic Energy Management Division (CalGEM) is currently delivered through an inefficient e-mail system and data coverage is very difficult to evaluate. As a result, developers are often required to commit substantial resources simply to conduct preliminary assessments of geothermal opportunities within California.

SCP encourages the California Geologic Survey to continue prioritizing resourcing of the proposed project and look for opportunities to encourage sharing of proprietary datasets and models.

Targeted state investment in cost-sharing early project investment in exploration and appraisal provides a key opportunity to catalyze next-generation scale-up.

As highlighted by the California Geologic Survey and the Mountain West Geothermal Consortium, geothermal exploration and appraisal is capitally intensive and due to the level of risk, difficult to finance. The \$10 million included in the 2026 state budget provides a significant opportunity for California to strategically address this challenge.

In evaluating projects for cost-share support, California should specifically target opportunities that both demonstrate additionality and are well-suited to serve as catalysts similar to the Utah FORGE project. If projects are sufficiently de-risked or have access to federal or private funding,

they should be deprioritized in favor of projects that cannot proceed without state support. Additionally, the primary focus for state investment should be projects with sufficient geologic potential and a technology plan enabling nearby development at the gigawatt-scale.

This funding should also specifically target high capex activities that are too large to be funded with the existing CEC Geothermal Grant and Loan Program or through equity investors, such as deep and directional fullbore wells that reach the basement rock and collect geologic and directly applicable drilling experience. This may mean that initial state funding will only be sufficient to fund de-risking a single geologic target, but SCP believes successful implementation can attract follow-on investment to enable geothermal testbeds in multiple sites across the state.

III. Regulatory Certainty and Market Signals

California should seek to provide regulatory certainty for next-generation geothermal development and maximize alignment with federal policy and neighboring states.

Regulatory certainty emerged as a recurring theme throughout the workshop. Perspectives shared by developers and industry stakeholders highlighted the importance of predictable regulatory frameworks and alignment with federal and neighboring-state policies in attracting investment and accelerating deployment.

During the workshop, the CPUC asked panelists about the state of regulatory certainty in Nevada and Utah compared to California. Fervo Energy stated that they see the most success when other states seek to maximize alignment with the federal government, noting that such regulatory alignment reduces the learning curve in applying experience and technology from other states and resultantly increases developer interest.

Relatedly, XGS Energy raised the point that many next-generation geothermal developers are unsure if their technology will be permitted in California, because the existing regulations are outdated and vague. SCP has had interactions with many geothermal developers concerned that California's ban on hydraulic fracturing ban for oil and gas would prevent EGS from being deployed. We see significant value in California creating regulatory certainty by borrowing from the federal government and neighboring states where possible and appropriate (Nevada is in fact actively development EGS regulations); this provides a clear signal to industry that California welcomes next-generation development aligning with a reasonable set of rules and regulations.

Waiting until the first project application is submitted to clarify regulatory requirements could introduce unnecessary development risk and delay, while missing an opportunity to signal that California welcomes responsible next-generation geothermal development. SCP recommends that CEC conveys the learnings from the IEPR process to CalGEM and encourage expansion of the scope of CalGEM's Statewide Geothermal Regulations pre-rulemaking to include next-generation technologies. This coordination would foster holistic assessment, permitting, and

planning of next-generation technology deployment between key agencies leading distinct elements of geothermal resource permitting processes.

California power providers have demonstrated the ability to procure geothermal at-scale and deployed novel commercial approaches that are more effective than central procurement.

In just the past five years, California power providers have shown leadership in procuring geothermal resources at-scale. Nine community choice aggregators (CCAs) formed California Community Power (CC Power) in 2021, a joint procurement entity representing over 12% of CAISO's load.

One of CC Power's first agreements was a portfolio power purchase agreement with Ormat for 125 MW of new geothermal capacity. Meanwhile, Fervo's 400 MW of geothermal capacity in Phase I of Cape Station in Utah has been completely contracted to power providers in California, including 320 MW with Southern California Edison. In parallel, SCP, CC Power, and Clean Energy Alliance have all formed early commercial partnerships with the geothermal industry to progress large portfolios of geothermal projects.

These examples demonstrate that California power providers can procure geothermal power on their own. And given this strong track record, SCP does not see a need for a central procurement entity for geothermal, as created in AB 1373. SCP encourages the CEC to share learnings from its IEPR engagements with the Department of Water Resources (DWR). SCP believes that joint agency coordination and awareness of current progress and natural demand for geothermal resources reduces the need for central procurement and avoids interfering with the large strides made in geothermal procurement by power providers, thereby maximizing the ability of a competitive market to deliver high-value resources to ratepayers.

IV. Permitting Reform and Project Delivery

California should develop a permitting guidebook for geothermal and explore opportunities to centralize permitting support for developers.

A consistent theme throughout the workshop was that geothermal development in California requires navigating a complex permitting landscape involving numerous agencies and approval processes.

As noted by XGS Energy, geothermal development in California involves a myriad of permits and agencies. This complexity creates additional cost, schedule, and development risk, and serves as a deterrent to in-state development.

During the workshop, several participants recommended development of a state guidebook that consolidates processes, creates templates, documents best practices, and provides technical guidelines. This could be provided to industry, counties, and state agencies to increase

knowledge, improve the quality of permitting review, and avoid duplication of past work. The CEC's California Energy Storage Permitting Guidebook provides a strong model suitable for adaptation for the geothermal industry.

XGS Energy additionally highlighted its positive experience in New Mexico, where a single contact has been established for shepherding developers through the permitting process. Federal legislation is similarly seeking to create an ombudsman to assist industry with navigating permitting and improving alignment between state agencies.³

Although the CEC's Application for Certification (AFC) and opt-in process provide similar centralization, the State should explore opportunities to specifically support geothermal resources, given the relative complexity of these projects and their permitting needs. This is also likely to increase in importance as projects electing to permit exploratory wells through local counties, requiring process integration.

The CEC should proactively implement an AB 531 opt-in pathway compatible with next-generation geothermal development and addressing past challenges with the AFC.

AB 531 established a centralized permitting pathway for geothermal projects of all sizes. However, given the CEC has not received an application yet, there is uncertainty about its ability to reduce permitting timelines and overcome past challenges geothermal projects have encountered in the AFC.

SCP is aware of several developers that they are electing to pursue alternative permitting pathways due to uncertainty surrounding timeline and process for the first AB 531 application. To address this concern, SCP encourages the CEC to proactively implement an AB 531 pathway and provide clarity to industry on the process, timeline, and scope.

The CEC should leverage the learnings from IEPR engagements and AB 531 as an opportunity to design a process that is compatible with next-generation geothermal and addresses constraints in the AFC process. Considerations should include removing the resource adequacy review (especially for next-generation projects that are not subject to the unique constraints driving conventional geothermal potential), increasing coordination with the permitting of the well field, and enabling a staged permitting pathway that enables early clearance for exploration activities.

California must create a statutory CEQA exemption for geothermal exploratory projects.

Sonoma County Supervisor, Lynda Hopkins, and XGS Energy identified the need for a California Environmental Quality Act (CEQA) exemption for geothermal exploratory projects as a critical policy opportunity for the State. The Legislature passed such a CEQA exemption in 2025 (AB 527), but it was vetoed by the Governor.

³ See U.S. Congress, House, *Geothermal Energy Advancement Act*, H.R. 5631, 119th Cong. (2026), engrossed in House, Congress.gov, <https://www.congress.gov/bill/119th-congress/house-bill/5631/text/eh>.

Exempting geothermal exploration that meets strict environmental standards is critical to attracting industry interest, because federal guidelines have provided a National Environmental Policy Act exemption on federal lands, thereby making development opportunities in other states comparably attractive. Geothermal exploratory projects are consistently found to have negligible environmental impact.

Burdening an exploration project with the significant cost and schedule risk that CEQA entails stops development dead in its tracks. Establishing a targeted exemption would send a strong signal to industry that California can permit exploration on competitive timelines with federal standards in other states and improve the ability to match the state's \$10 million in funding to reduce risk with industry dollars.

V. Land Access and Interagency Coordination

California should facilitate coordination with the Bureau of Land Management (BLM) and the State Lands Commission (SLC) to improve the availability of public lands for geothermal development.

Although not the focus of the workshop, efforts by the CEC and partner agencies to include recommendations on improving land availability for geothermal development would mark significant progress in evaluating development potential.

Increased coordination with the Bureau of Land Management and State Lands Commission offers a key priority to improve the availability of public lands for geothermal development; public lands have played a critical role in California's historic geothermal development, and are anticipated to do so in the future, as well. Areas of focus should include land transfers, royalty rates, lease nomination processes, data availability, and environmental clearance. Promoting development on public lands both improves accessibility to industry and creates additional co-benefit revenue streams for the state, local governments, and even the teacher pension fund.

Conclusion

California's decarbonization pathway requires a high degree of stakeholder coordination, process alignment, and technological innovation. The discussions during this workshop reinforced that next-generation geothermal resources, including EGS, can play a uniquely valuable role in achieving the state's long-term climate and energy objectives. These resources provide a rare combination of high-capacity-factor, zero-carbon, dispatchable energy that can improve grid reliability, reduce dependence on fossil generation, and optimize the utilization of existing and future transmission infrastructure. However, realizing these benefits will require coordinated action across resource planning, transmission development, market design, permitting, data collection, and early-stage project development to provide the certainty needed to support investment in geothermal projects.

SCP strongly supports the CEC's efforts to evaluate both the value of and barriers to in-state geothermal resource development. The recommendations discussed throughout this workshop highlight meaningful opportunities to improve resource characterization, align transmission planning with commercially viable development opportunities, modernize regulatory and permitting frameworks, expand access to critical geologic data, and strategically invest in exploration and appraisal activities. Continued coordination among the CEC, CPUC, CAISO, and other state partners will be essential to ensuring that planning processes, procurement frameworks, transmission investments, and permitting pathways work together to accelerate deployment of the clean firm resources needed to achieve California's energy and climate goals.

SCP appreciates the CEC's leadership in convening this workshop and advancing a thoughtful dialogue on the future of geothermal energy in California. We look forward to continued collaboration with the CEC, CPUC, CAISO, and other state agencies as the 2026 IEPR process moves forward and actionable policy recommendations are developed. SCP remains committed to supporting these efforts and is happy to serve as a resource by sharing lessons learned through our ongoing work to advance geothermal development in Sonoma and Mendocino Counties. Please do not hesitate to reach out with questions or opportunities for further engagement.

Sincerely,

A handwritten signature in black ink, appearing to read 'Adam Jorge', with a long horizontal flourish extending to the right.

Adam Jorge

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