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Sonoma Clean Power Authority Electric Program Investment Charge 2026â€“2030 (EPIC 5) Research Concept Proposal Form (1 of 2)

Additional submitted attachment is included below.

Sonoma Clean Power

431 E Street
Santa Rosa, CA 95404

sonomacleanpower.org

August 8, 2025

California Energy Commission
715 P Street
Sacramento, CA 95814

Docket No.: 25-EPIC-01

Re: Sonoma Clean Power Authority Electric Program Investment Charge 2026–2030 (EPIC 5) Research Concept Proposal Form (1 of 2)

Dear California Energy Commission,

Sonoma Clean Power Authority (SCP) is pleased to submit the following Research Concept Proposal Form supporting the California Energy Commission's (CEC) Electric Program Investment Charge 2026 – 2030 (EPIC 5) Investment Plan program efforts. This file is the first of two Research Concept Proposal Forms submitted by SCP.

SCP is the public power provider for Sonoma and Mendocino counties, serving a population of about a half-million. SCP is dedicated to expanding our renewable portfolio while advancing energy sector decarbonization and enabling equitable access to clean, renewable, and reliable power for all our customers.

SCP believes that the Strategic Goals identified in the EPIC 5 Investment Plan offer significant opportunities to lead innovation and research and advance technologies to support ratepayers throughout the state. These efforts are increasingly essential as Californians face increased affordability, reliability, and resilience challenges alongside increased climate risks. Concepts guided by EPIC 5 Strategic Goals will provide invaluable research and pilot projects designing unique, scalable approaches to support decarbonization and affordability.

Thank you for your time and consideration. Please feel free to contact me with any questions.

Sincerely,

Adam Jorge
Senior Decarbonization Policy Manager
ajorge@sonomacleanpower.org
(707) 293-6230

APPENDIX A – Sonoma Clean Power Authority EPIC 5 Research Concept Proposal Form (1 of 2)

1. *Please provide the name, email, and phone number of the best person to contact should the CEC have additional questions regarding the research concept:*

Ryan Tracey
Director, Planning and Analytics
rtracey@sonomacleanpower.org
(720) 480-9641

2. *Please provide the name of the contact person's organization or affiliation:*

Sonoma Clean Power Authority (SCP)

3. *Please provide a brief description of the proposed concept that you would like the CEC to consider as part of the EPIC 5 Investment Plan. What is the purpose of the concept, and what would it seek to do? Why are EPIC funds needed to support the concept?*

Sonoma Clean Power (SCP) proposes the CEC consider funding a project through EPIC to de-risk the deployment of next-generation geothermal technologies in California by providing a cost-share for drilling initial calibration wells for enhanced geothermal system (EGS) or advanced close loop projects in distinct geologic settings in the state.

The project is meant to replicate the success of the Department of Energy's (DOE) Frontier Observatory for Research in Geothermal Energy (FORGE) project in Utah in attracting investment in next-generation geothermal projects that are critical to meeting the state's decarbonization goals and future reliability needs. As it stands, almost all development in next-generation geothermal technologies is happening out of the state, and most of this development is concentrated adjacent to FORGE where federal funding has covered the cost of drilling the initial set of higher-risk calibration wells to collect subsurface data and operational learnings.

The power from these next-generation geothermal projects is predominately being sold to California, which has limitations due to regional transmission capacity and presents a large missed economic opportunity for the state. Funding calibration wells in several different geologic settings in California opens the door to a large scale-up of clean firm resources that are more proximal to market and the creation of many local high-wage jobs and economic benefits to California communities. The current funding available through the CEC's Geothermal Grant and Loan Program (GGLP) is insufficient to accomplish this goal; calibration wells are expected to cost as much as $20 million which far exceeds the GGLP's max award size of $1.5 million.

4. *In accordance with Senate Bill 96, please describe how the proposed concept will "lead to technological advancement and breakthroughs to overcome barriers that prevent the achievement of the state's statutory energy goals." For example, what technical and/or market barriers or customer pain points would the proposed concept address that would lead to increased adoption of clean energy technology or innovation? Where possible, please provide specific cost and performance targets that need to be met for increased industry and consumer acceptance. For scientific analysis and tools, provide more information on what data and information gaps the proposed concept would help fill, and which specific parties or end users would benefit from the results, and for what purpose(s)?*

   Meeting California's SB 100 goal while maintaining affordability and reliability is strongly dependent on the successful development of clean firm resources — renewable or zero-carbon generation that provides energy at a high capacity factor throughout the day and year. Next-generation geothermal is quickly becoming one of the most promising clean firm resource technologies and EGS deployment in Utah is demonstrating a rapid rate of learning and associated decline in costs. EGS is on trajectory to meet the DOE's Geothermal Earthshot cost target of $45/MWh by 2035.

   However, EGS's role in California's future energy system is limited by two factors: (1) transmission availability, and (2) the risk of deployment in new geologic settings.

   The one region where EGS has been de-risked in Utah requires use of regional transmission for delivery to California, which is limited. And although there are excellent geologic conditions in California for next-generation geothermal development with less dependency on transmission, the risk of project development without first drilling a calibration well is too great. The first calibration well collects subsurface data (temperature, rock properties, etc.) and execution experience (drilling time, best practices, etc.) that are specific to California's geology. Findings resulting from this research are critical data inputs needed to finance next-generation geothermal development projects.

   The DOE currently maintains tools that allow estimating the levelized cost of electricity (LCOE) for next-generation geothermal development given well cost, temperature, and flow rate. Although the DOE cost target for EGS is $45/MWh by 2035, the grid benefits of clean firm capacity today easily provide over $90/MWh of value. The project should seek to unlock new geologic settings with the potential to deliver energy below $90/MWh.

5. *Please describe the anticipated outcomes if this research concept is successful, either fully or partially. For example, to what extent would the research reduce technology or ratepayer costs and/or increase performance to improve the overall value proposition of the technology? What is the potential of the innovation at scale? How will the innovation lead to ratepayer benefits in alignment with EPIC's guiding principles to improve safety, reliability, affordability, environmental sustainability, and equity?*

   Successful calibration wells will unlock next-generation geothermal development in new in-state geologic settings, thereby creating a magnet for investment similar to the effect of the FORGE project in Utah. Providing in-state opportunities for next-generation development will reduce the dependency on meeting California's decarbonization goals on regional transmission. Increasing the diversity of opportunities will also encourage competition and innovation in the private sector, leading to reduced costs for ratepayers.

The scale-up potential is huge given the prevalence of favorable geologic conditions in California; the state could ultimately become an exporter of clean firm capacity. Providing opportunities for development in-state rather than relying on out-of-state resources also reduces reliability risks and allows California to be in the driver seat for establishing high expectations on safety and environmental standards. Geothermal development also provides high-paying jobs and a just transition for the state's oil and gas workforce.

6. *Describe what quantitative or qualitative metrics or indicators would be used to evaluate the impacts of the proposed research concept.*

Key metrics for a proposed project could include rate of penetration, bit life, well cost, maximum depth, maximum temperature, and temperature gradient. These parameters, along with an estimate of flow rates from rock property data, can be used to develop an expected levelized cost of electricity for a follow-on development. A successful calibration well can be used as part of a future well doublet for an EGS or advanced close loop flow test to collect actual flow rate data. The project will also collect valuable information on permitting timelines, workforce availability, supply chains, and economic benefits of drilling next-generation geothermal wells.

7. *Please provide references to any information provided in the form that supports the research concept's merits. This can include references to cost targets, technical potential, market barriers, equity benefits, etc.*

- United States Department of Energy. Pathways to Commercial Liftoff: Next-generation Geothermal Power, Department of Energy. March 2024. https://cdn.catf.us/wp-content/uploads/2025/06/09154348/doe-liftoff-nextgen-geothermal.pdf
- Clean Air Task Force. Unlocking California's Geothermal Potential: A Strategic Opportunity for Clean, Firm Power. June 2025. https://cdn.catf.us/wp-content/uploads/2025/06/23162128/california-geothermal-report.pdf
- National Renewable Energy Laboratory. Enhanced Geothermal Shot Analysis for the Geothermal Technologies Office. January 2023. https://docs.nrel.gov/docs/fy23osti/84822.pdf
- Ricks and Jenkins, Princeton University. Pathways to national-scale adoption of enhanced geothermal power through experience-driven cost reductions. July 2025. https://www.sciencedirect.com/science/article/ abs/pii/ S2542435125001527

8. *The EPIC 5 Investment Plan must support at least one of five Strategic Goals:*
    a. *Transportation Electrification*
    b. *Distributed Energy Resource Integration*
    c. *Building Decarbonization*
    d. *Achieving 100 Percent Net-Zero Carbon Emissions and the Coordinated Role of Gas*
    e. *Climate Adaptation*

Please describe in as much detail as possible how your proposed concept would support these goals.

The proposed concept is absolutely critical to achieving the EPIC 5's strategic goal of achieving 100% net-zero carbon emissions. Reaching 100% net-zero carbon emissions is dependent on an electric system that is decarbonized, reliable, and affordable. Without reliability and affordability, it will be impossible to grow cross-sector electrification. Clean firm resources are the most promising option to meet these needs, but the viability of these types of resources in-state is limited. The proposed project addresses this need head-on by providing the needed funding to de-risk next-generation geothermal development in California. If successful, several distinct regions in California could replicate the success of DOE's FORGE in attracting investment and providing the foundation for a large scale-up that provides both ratepayer benefits and significant economic benefits to the state.