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Recommendations for 2025 SB 100 Joint Agency Report, from Geothermal Rising

Thank you for this opportunity.

Additional submitted attachment is included below.



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March 20th, 2026

California Energy Commission
SB 100 Joint Agency Report Team
715 P Street
Sacramento, CA 95814

Re: Recommendations for 2025 SB 100 Joint Agency Report, from Geothermal Rising

Dear Commissioners,

Geothermal Rising Action, an affiliate of Geothermal Rising - the trade association representing the American geothermal industry, writes to provide feedback and recommendations regarding the 2025 SB 100 Joint Agency Report. We strongly support the goals of Senate Bill 100 (2018, de León): to reduce carbon emissions from electricity used in California to net-zero by 2045. We also appreciate the leadership of the Joint Agencies in fostering a clean future, by prioritizing clean, safe, affordable and reliable energy solutions.

Achieving this target will require a significant expansion of firm, clean power resources that can reliably support grid stability as the state transitions away from fossil fuels. Geothermal energy is uniquely positioned to provide this type of always-available clean generation, and scaling up in-state geothermal development should be a central strategy for meeting California's SB 100 goals.

The current 2025 Joint Agency Report includes several statements that raise concerns regarding the treatment and future role of geothermal energy in California's energy portfolio. We address these concerns below.

Geothermal Potential in California

Geothermal Rising would like to address the implications of Slide 23, presented at the February 19th, 2026, Hybrid Workshop on 2025 SB 100 Joint Agency Report Draft Results. It states that *"Most geothermal and high capacity factor wind potential in CA have already been captured by existing and planned resources."*¹

This statement does not reflect the current understanding of California's geothermal resource potential². California remains one of the most promising locations in the United States for geothermal energy development due to its exceptional geologic resources, existing technical expertise, and strong clean

¹ Presentation from the 02/19/2026 workshop on SB 100:

<https://www.energy.ca.gov/event/workshop/2026-02/hybrid-workshop-2025-sb-100-joint-agency-report-draft-results>

² Map of Known Geothermal Resource Areas (KGRA) in California:

<https://cecgis-caenergy.opendata.arcgis.com/documents/CAEnergy:known-geothermal-resource-areas>



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energy goals. New technologies are significantly reducing geothermal costs. The CPUC's directives to procure clean firm power, including its recent decision that 25% of the new clean source procurement must be from resources that have the attributes associated with clean, firm power and/or long-duration energy storage reflect this.

Although geothermal development in California has slowed in recent years, this slowdown is primarily the result of market trends and policy issues, rather than a lack of viable and undeveloped resources.

Reduced Cost of Developing Geothermal

The assumptions used in the 2025 report are out of date, and these inaccuracies can lead to misguided recommendations. We recommend considering the following resources:

- The current SB100 model used out of date cost curves, and to better represent the actual cost data we recommend using another source, such as the 2025 paper by Dayo Akindipe and Erik Witter of the National Lab of the Rockies (NLR); *2025 Geothermal Drilling Cost Curves Update*³.
- Levelized Cost of Electricity (LCOE) has become precise for geothermal energy and currently ranges from \$66-\$109/ MWhr⁴. According to the current NLR ATB, this is comparable to the cost of Utility PV+Battery, and significantly below that of projected offshore wind costs.

GR is concerned that the use of outdated Annual Technology Baseline (ATB) assumptions will lead the State to overlook the enormous potential of geothermal energy to contribute clean firm power, providing critically-needed diversification of the state's electricity supply.

Advantages of Geothermal

Worth noting about the ATB LCOE calculations is that they do not reflect the value of reliability of the power source, which is one of geothermal energy's core advantages. Unlike other renewable energy sources, geothermal power production is continuous and doesn't require expensive energy storage.

When considering the state's energy portfolio, increasing geothermal power production is good for the power grid due to its 24/7 firm nature. When weather-reliant power sources are not producing electricity their equipment is sitting idle during down time, leaving the grid unsupported. Flexible and dispatchable geothermal energy can be ramped up or down to meet the needs of the grid and fill in gaps of energy demand. Constantly available power is the missing piece of the energy mix needed to stabilize the California power grid during times of weather irregularities, as well as during the daily peak demand times.

³ Akindipe, et. al., 2025, Stanford Geothermal Workshop.

<https://pangea.stanford.edu/ERE/pdf/IGAstandard/SGW/2025/Akindipe.pdf>

⁴ Lazard 2025 report: <https://www.lazard.com/research-insights/levelized-cost-of-energyplus-lcoeplus/>



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Geothermal is a good investment for the state of California due to the firm, dependable nature of the power source, which is a more cost effective resource for the grid. A secure and predictable power grid is required to maintain stable energy production and avoid power outages during shifts in demand.

Next Generation Geothermal Technology

The development of new geothermal technologies, includes: closed-loop, pressure geothermal, super-hot super-deep, enhanced geothermal systems (EGS), advanced geothermal systems (AGS) and other innovations. These are revolutionizing the geothermal sector by dramatically expanding the geographies where geothermal energy is possible⁵. We recommend including "Next Generation Geothermal" (NGG) in the SB100 report as a section for non-hydrothermal resources due to CapEx and timeline differences. This technology agnostic term encompasses a wide range of current approaches. Inclusion of NGG will ensure the SB 100 Report remains applicable for both existing and emerging technology development. The recently released 2025 US Geothermal Market Report by the NLR details the market-ready viability of NGG, as it makes up 60% of geothermal PPAs (power purchase agreements) from the last 5 years.

Additionally, the CA Governor's Office of Business (GoBiz) has recently released preliminary findings for a report that details Clean Energy Project Assessment that highlights the top three emerging clean energy producing technologies. The first technology present is focused on the opportunities of Next Generation Geothermal⁶.

Derisking Efforts for EGS

The US Department of Energy (DOE) in recent years has focused on derisking EGS by funding research aimed at cutting costs, advancing technology transfer and accelerating timelines. These efforts include:

- EGS Collab⁷ - Monitored rock stimulation to map fracture propagation in underground lab
- Energy Earthshot Initiative⁸ - Launched in 2021 to accelerate breakthroughs in clean energy
- Utah FORGE⁹ - The Frontier Observatory for Research in Geothermal Energy in Milford, UT

Additionally, the NLR dataset which provides the national standard for geothermal ATB calculations has separated resources into two categories: hydrothermal and EGS. Both categories are further broken down into high-temp flash (AKA deep), and low-temp binary (AKA near field) resource subcategories.

⁵ NLR 2025 Geothermal Market Report: <https://docs.nrel.gov/docs/fy26osti/91898.pdf>

⁶ GO Biz presentation from 12/16/2025, [LINKED](#)

⁷ Kneafsey et al., 2022 <https://onepetro.org/ARMAUSRMS/proceedings-abstract/ARMA22/ARMA22/ARMA-2022-2261/510578>

⁸ Augustine, et al., 2023, <https://docs.nrel.gov/docs/fy23osti/84822.pdf>

⁹ Dupriest et al., 2024, <https://onepetro.org/SPEDC/proceedings-abstract/24DC/24DC/D03IS024R002/542951>



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While geothermal costs vary by location, condition and technology used, and cost reductions achieved in states like Utah might not be precisely mirrored in states like California, the clear trend is one of continuing reductions.

Leveraging technologies from the oil and gas industry, and improvements from other energy generating industries, has continued to achieve increased efficiencies, significant reductions in drilling costs, and expanded capabilities.

Opportunity Noted in 2021 Report – Still Missing from 2025 Report

The 2021 Report noted cost reductions in geothermal but did not include them in the modeling assumptions, and assumed almost no growth in geothermal production in California. Further, the 2021 Report observed that geothermal would benefit from using updated cost data, the role of geothermal is presently evolving, as stated below:

“While the joint agencies attempt to use the most current publicly available and vetted cost data, there can be significant changes in available data after the modeling has been conducted. The [NLR] ATB is updated annually, usually with incremental adjustments to cost data. The 2020 ATB update, which was released after modeling for this report was underway, however, included a 30 percent reduction in geothermal cost projects, based on the Department of Energy Geovision Report.”¹⁰

If possible, we would recommend the CEC rerun their model for geothermal, or use the CPUC model, to ensure consistency across state agencies. Additionally, having more than one resource category for geothermal projects will enable a more accurate representation of actual project costs.

Geothermal Rising Action would welcome the opportunity to meet informally with your office to discuss these recommendations further. We appreciate your leadership in renewable energy and look forward to continued collaboration to help CA realize its full geothermal potential.

Respectfully,

Caity Smith
Geothermal Rising Action, Board President

¹⁰ Excerpt from page 92 of the 2021 SB 100 Joint Agency Report, <https://www.energy.ca.gov/publications/2021/2021-sb-100-joint-agency-report-achieving-100-percent-clean-electricity>