



Staff Report - Item 06

To: Sonoma Clean Power Authority Community Advisory Committee

From: Ryan Tracey, Director of Planning & Analytics
Geof Syphers, Chief Executive Officer

Issue: Receive Geothermal Opportunity Zone Update

Date: November 17, 2022

Background

The Geothermal Opportunity Zone (GeoZone) was established by the SCP Board of Directors and the Boards of Supervisors in Sonoma and Mendocino Counties to explore expanding local geothermal power capacity. The purpose of the GeoZone is to develop the resources necessary to allow SCP to stop relying on natural gas power plants altogether. To that end, the GeoZone is seeking to sustain existing local geothermal production and add 500 MW of new geothermal capacity.

Ongoing updates, information, and materials about the GeoZone can be found at <https://sonomacleanpower.org/geozone>.

Cooperation Agreements

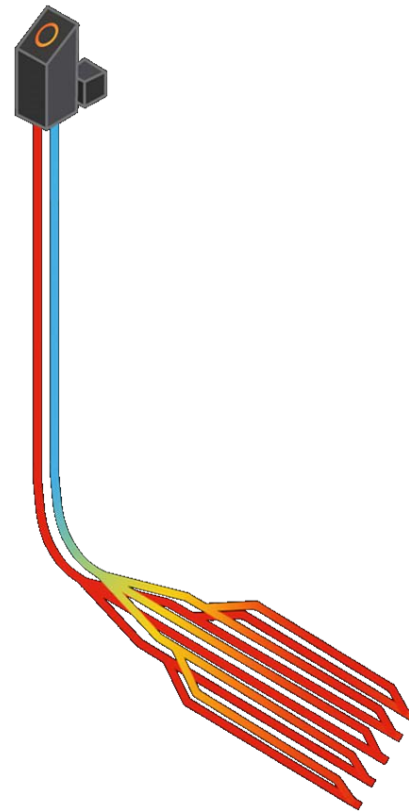
Staff are working on the draft cooperation agreements for the three selected private partners: Eavor Inc., Chevron New Technologies, and Cirq Energy. Each cooperation agreement will be presented to the CAC and Board for approval before execution, likely early in 2023.

Advanced Closed Loop (ACL) Technology

During the November Board meeting, a question arose concerning the dispatchability of advanced closed loop (ACL) technology. Staff provided a verbal response, explaining that ACL can store energy subsurface by shutting-in production during solar hours, waiting for subsurface fluids to be heated beyond their non-dispatchable state, and then produced in high-need hours in the evening—where the additional heat enables enhanced generation output.

To increase understanding of ACL technology, staff also share a schematic of an ACL project here. Figure 1 is a graphic from Eavor depicting the configuration of their Eavor-Deep ACL technology. Below is a high-level explanation for how Eavor-Deep works:

Figure 1. Advanced Closed Loop (ACL) Schematic



- Low temperature water descends a cased vertical wellbore deep into the subsurface (blue in graphic)
- In the geologic target, the cased well connects to a downhole “radiator” of slightly deviated multi-lateral boreholes with a sufficient surface area to facilitate heat transfer
- A separate set of multi-lateral boreholes connect at the toe to allow heated water (which is lower density) to ascend to surface
- A separate cased vertical wellbore connects to the second set of multi-lateral boreholes and brings the heated water to surface (red in graphic)
- A heat exchanger at the surface transfers heat from the water circulating through the wellbores to a separate working fluid with a lower boiling point (probably an organic compound such as pentane) that is used to drive a turbine

Staff encourages those wishing to learn more about ACL to visit [Eavor’s website](#), which includes both accessible explanations of their technology and a comprehensive technical library. Eavor also recently [released a video](#) on their technology that includes useful visuals of both the construction and operation of ACL.

Transmission Planning

Staff has initiated a project with a transmission consultant to review strategic and tactical considerations for transmission planning in the GeoZone. The consultant will

provide staff with guidance on which transmission lines in the GeoZone are likely to have sufficient capacity for pilot projects and scale-up. Staff is also asking the consultant to characterize larger-scale network upgrades that may be triggered by GeoZone development projects. Although development partners will be expected to lead the interconnection process, first-hand transmission knowledge will enable SCP to effectively advocate for the GeoZone in the CPUC and CAISO's transmission planning processes.

SCP proactively submitted comments in a recent ruling by the CPUC establishing the process and scope of the 2023-2024 transmission planning process. In joint comments with the Redwood Coast Energy Authority, SCP asked the CPUC to increase its expected contribution of geothermal resources in the GeoZone area, accelerate long-lead transmission projects that are inhibiting local resource development (specifically citing a 500 kV Delevan project with a projected 12-year construction time), and consider synergies between building transmission for offshore wind and the GeoZone.

Other News

- The Department of the Treasury asked for feedback on the implementation of the tax credits in the Inflation Reduction Act (IRA) by November 4. SCP submitted comments concerning the eligibility of geothermal projects, the scope of credit enhancements, and the ability for SCP to receive credits as a direct payment.
- SCP was invited to deliver a guest lecture to students at the University of Texas at Austin on the GeoZone. Staff provided eager students an overview of the California energy market, the increasingly important role of Community Choice Aggregation (CCA), and the GeoZone's approach to leveraging a public power provider's community relationships and offtake commitment to promote deployment of new and important energy technologies.