

**BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF CALIFORNIA**

Order Instituting Rulemaking to Develop an Electricity Integrated Resource Planning Framework and to Coordinate and Refine Long-Term Procurement Planning Requirements.	Rulemaking 16-02-007 (Filed February 11, 2016)
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**COMMENTS OF THE GEOTHERMAL RESOURCE COUNCIL IN RESPONSE TO
ADMINISTRATIVE LAW JUDGE RULING SEEKING COMMENTS ON INPUTS AND
ASSUMPTIONS FOR DEVELOPMENT OF THE 2019-2020 REFERENCE SYSTEM
PLAN**

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I. INTRODUCTION

The Geothermal Resource Council (GRC) submits these comments in response to the *Administrative Law Judge’s Ruling Seeking Comments on Inputs and Assumptions for Development of the 2019-2020 Reference System Plan (Ruling)* issued on November 29, 2018 and modified by an E-mail ruling issued December 6, 2018. The GRC is a tax-exempt, non-profit, educational association 501(c)(3). Formed in 1970, the GRC was incorporated in the state of Washington in 1972 and in California in 1981. The GRC actively seeks to expand its role as a primary professional educational association for the international geothermal community. The GRC serves as a focal point for continuing professional development for its members through its outreach, information transfer and education services.

II GENERAL COMMENTS

The ruling proposes that the Reference System Plan (RSP) for 2019-2020 will be developed using an updated version of the RESOLVE model, which was used for developing the 2018 RSP. RESOLVE is dependent on a series of assumptions and “forecasts of load growth, technology costs, and potential, fuel costs and policy constraints.”¹ The geothermal results across scenarios, especially between the 2017 and 2018 versions of the 42 MMT scenario, have

¹ [ALJ Ruling](#), page 2

been quite volatile, the 2017 42 MMT scenario resulted in the selection of 200 MW of geothermal, while the 2018 42 MMT scenario resulted in 1,700 MW. The GRC suggests the Commission require all other parties using different models and methods to create benchmark cases which can be compared to those using RESOLVE.

Additionally, in the context of the announced retirement of the Diablo Canyon Nuclear Power Plant in 2024-2025, the GRC believes resource diversity is a critical consideration in upgrading the grid to eliminate GHG emissions from electricity generation. Replacing a portion of Diablo's baseload capacity with a diverse set of baseload renewables is imperative and will result in less impacts on transmission facilities, reduced risks of curtailment due to over-generation, and less storage to extend the capacity factor of intermittent resources. The GRC strongly encourages the Commission to consider the value of resource diversity in its integrated planning process.

III GRC'S RESPONSE TO QUESTIONS RAISED IN RULING

The Ruling identified questions regarding proposed inputs and assumptions for the 2019-2020 RSP as well as the estimation of Criteria Pollutant Emissions. The GRC limits its comments to a subset of those questions but reserves the right to reply to comments regarding other questions in its Reply Comments.

Attachment A

Question 6a. Question 6a addresses the appropriateness of all of the resource types proposed to be modeled.

The GRC supports the continued evaluation of geothermal resources in RESOLVE and the CPUC IRP proceeding. The GRC believes additional attention should be given to the assumed installed costs, regional resource availability, economic value and reliability of geothermal resources.

Questions 8-9. Questions 8-9 address the years modeled in the IRP planning horizon and some scenarios in years beyond that planning horizon.

The GRC supports the proposed method for continuity in the planning horizon described in Question 8, but also include years beyond 2030 as examined in Question 9.

The GRC is concerned that the RESOLVE model only selects geothermal for the last interval representing 2030, implying a commercial on-line date (COD) around that year. This results in two issues. The first issue is that this outcome is not consistent with new geothermal contracts in California with commercial on-line dates beginning in 2017. The second issue is that the closer the geothermal COD is to 2030, the longer the term of the 20-25 year contract which would take place after 2030, and hence its value would in part be reflective of conditions in those subsequent years.

Question 12. The GRC has the following additional comments on the appropriateness of the draft inputs and assumptions.

The GRC's primary concern is related to geothermal resource costs (Att. A, Section 4.2.2). The geothermal cost metrics and estimated cost results need to be updated and amended regularly. Within the downloaded version of the RESOLVE User Interface model, the "generic" installed cost of geothermal was found to be \$5,063/kW, as shown in the tab "COSTS_Resource_Char," cell L22.

These costs are not consistent with recent geothermal project costs. The Los Angeles Department of Water and Power, the largest municipal utility in the United States, serving over four million residents for example has disclosed that it has entered into a new, 26-year power sales agreement for approximately 150 MW of power to be generated by a portfolio of new and existing binary geothermal power plants.² The portfolio PPA contract capacity is 150 MW, with a minimum capacity of 135 MW and maximum potential capacity of 185 MW. The portfolio PPA is for a term of approximately 26 years, expiring in December 31, 2043 and has a fixed price of \$75.50 per MWh.³

² <http://www.ladwpnews.com/new-geothermal-project-helps-create-clean-energy-future-for-los-angeles/>

³ <https://www.snl.com/IRW/file/4087066/Index?KeyFile=2000842054>

The RESOLVE results for geothermal are highly sensitive to small changes in the assumed installed costs of different resources therefore it is imperative to have the most accurate geothermal pricing available. The CPUC should include a range for geothermal installed costs. This could be done by creating a similar sensitivity option as for some other resources: \$5,063/kW (High), \$4,500/kW (Mid), \$4,000/kW (Low).

IV SUMMARY OF GRC RECOMMENDATIONS

- a. If, as the CPUC proposes, RESOLVE is used again in the 2019 IRP cycle, the GRC suggests the Commission require all other parties using different models and methods to create benchmark cases which can be compared to those using RESOLVE. Additionally, in the context of the announced retirement of the Diablo Canyon Nuclear Power Plant in 2024-2025, the GRC believes resource diversity is a critical and a portion of Diablo's baseload capacity should be replaced with a diverse set of baseload renewables.
- b. The CPUC should include a range for geothermal installed costs. This could be done by creating a similar sensitivity option as for some other resources: \$5,063/kW (High), \$4,500/kW (Mid), \$4,000/kW (Low).
- c. The CPUC should evaluate why RESOLVE's results do not build new geothermal until 2030 even in low cost geothermal and high cost solar/battery scenarios. This result is not consistent with new geothermal contracts in California with commercial on-line dates beginning in 2017.