

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

Order Instituting Rulemaking to Oversee
the Resource Adequacy Program, Consider
Program Refinements, and Establish
Annual Local and Flexible Procurement
Obligations for the 2019 and 2020
Compliance Years.

Rulemaking 17-09-020
(Filed September 28, 2017)

**CALIFORNIA INDEPENDENT SYSTEM OPERATOR CORPORATION REPLY
COMMENTS ON RESOURCE ADEQUACY PROPOSALS**

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I. Introduction

The Commission issued its Scoping Memo and Ruling of Assigned Commissioner and Administrative Law Judge (Scoping Memo) on January 18, 2018. The California Independent System Operator Corporation (CAISO) and other parties submitted resource adequacy related proposals on February 16, 2018, the Commission held a workshop on the proposals on February 22 and 23, 2018 (February Workshop), and parties submitted subsequent comments on March 7, 2018 (March 7 Comments). The CAISO hereby submits reply comments regarding the following:

- (1) The timeline and filing process for the local and flexible capacity requirements studies;
- (2) Clarifications regarding the CAISO's proposal regarding the use of availability-limited resources to meet local capacity requirements;
- (3) The need to expeditiously adopt a multi-year resource adequacy framework;
- (4) Refinements to the Effective Load Carrying Capacity Methodology (ELCC);
- (5) The CAISO's system load forecast proposal; and
- (6) The CAISO's availability assessment hours proposal.

II. Discussion

A. Local and Flexible Capacity Requirements

As stated in its March 7 Comments, the CAISO continues to believe that the Commission should delay a decision on 2019 local and flexible resource adequacy requirements until July 12, 2018. This timeline will allow the CAISO to file the final 2019 local and flexible capacity

requirements studies and parties to comment on the studies in this proceeding.

The CAISO is on target to finalize the local and flexible capacity requirements studies by May 15, 2018. The CAISO anticipates issuing the draft local capacity requirement study on April 23, 2018. The Scoping Memo requested that the CAISO file the draft local capacity requirements study with the Commission, but the CAISO believes that such a filing is unnecessary because the draft results should not be used to establish procurement requirements and the CAISO process already provides an opportunity to comment on the draft local capacity study. Indeed, there typically are four separate opportunities for parties to comment on the local capacity results in the various CAISO and Commission processes. The CAISO provides two opportunities for parties to comment on the CAISO local capacity results; the first is after the CAISO releases preliminary results, and the second is after the CAISO issues the draft local capacity study.¹ The CAISO then files the final local capacity requirements study in the resource adequacy proceeding, and the Commission typically provides two additional opportunities for parties to comment. Rather than adding a fifth opportunity to comment, the Commission should take judicial notice of the comments filed in the CAISO's stakeholder process and consider eliminating the reply comment period on the final local capacity requirement study to streamline the process.

B. Availability-Limited Resource Proposal

1. Background

During the course of this proceeding, the CAISO presented its methodology for analyzing the operational characteristics of availability-limited resources to ensure compliance with local capacity requirements (Availability-Limited Resource Proposal). The purpose of the Availability-Limited Resource Proposal is to provide critical information regarding local capacity needs to guide local resource adequacy procurement. Specifically, in Phase 1, the CAISO proposes using detailed transmission planning analysis to determine the maximum level of four-hour duration resources that are electrically effective at resolving the contingencies studied to establish local capacity requirements. The proposal does not limit the quantity of preferred resources that can count toward local capacity requirements. Rather, it would merely

¹ Preliminary local capacity results will be posted on the CAISO website by close of business on April 4. The CAISO will hold a workshop on the preliminary results on April 9 and stakeholders can provide comments by close of business on April 16.

cap the amount of four-hour duration resources within a local capacity area. There would be no cap on resources with greater than a four-hour duration because they are electrically capable of meeting local capacity requirements at greater levels of resource penetration. In Phase 2, the CAISO will coordinate with the Commission to refine its transmission planning analysis to provide more flexibility and guidance to inform future procurement.

2. Availability-Limited Resource Studies and Procurement

To ensure reliability in the local capacity areas, the CAISO conducts detailed engineering analyses to understand whether resources procured in local capacity areas are electrically capable of serving load under contingency conditions. The analyses do not exclude or limit preferred resources or energy storage; rather, they study whether there are sufficient procured resources to resolve the studied contingencies. The CAISO validates the effectiveness of the portfolio based on resources' actual operational characteristics to ensure that local capacity requirements are met. In recent years, the CAISO has had to undertake more granular analyses as availability-limited resources displace resources with few, if any, limits on duration. For example, for the Moorpark sub-area, the CAISO conducted a detailed analysis to determine the quantity and operational characteristics of availability-limited resources that would be necessary to meet local capacity requirements (Moorpark Study).² As more availability-limited resources displace conventional generation, this type of prospective, granular analysis will become increasingly necessary to guide procurement and ensure that local capacity needs are met. The transmission planning analyses underlying the Availability-Limited Resource Proposal employ the same methodology the CAISO used in the Moorpark Study to provide procurement guidance across all local capacity areas and sub-areas.

These transmission planning analyses highlight that the need for greater resource availability increases as the penetration of availability-limited resources increases within a local area.³ Based on the CAISO's studies, the most limiting operational characteristic at this time is the run-time limitation, or duration, of the resources in the local area. To guide future procurement and ensure that procured resources meet local capacity needs, Phase 1 of the

² California Independent System Operator, Moorpark Sub-Area Local Capacity Alternative Study, August 16, 2017, http://www.caiso.com/Documents/Aug16_2017_MoorparkSub-AreaLocalCapacityRequirementStudy-PuentePowerProject_15-AFC-01.pdf and February Workshops.

³ See Presentation, materials, and stakeholder comments for the October 2016 and 2017 workshops are available at: <http://www.caiso.com/Pages/documentsbygroup.aspx?GroupID=9457D220-D7EE-4828-94F4-1D9A30B6E812>.

Availability-Limited Resource Proposal would establish maximum capacity levels for four-hour duration limited resources within each local capacity area based on the CAISO's transmission planning analysis. The four-hour duration threshold is meant to align with the Commission's current minimum four-hour duration requirement for demand response and similar use-limited resources. Load serving entities can procure resources with greater than a four-hour duration in excess of the cap and count them toward meeting local capacity needs. If longer duration resources are procured, the CAISO will consider them and their effectiveness in the local capacity study process.

The Availability-Limited Resource Proposal does not limit the maximum capacity of availability-limited resources. Rather, Phase 1 of the proposal seeks to minimize disruption to the current resource adequacy framework while maintaining local reliability by leveraging the Commission's existing four-hour duration requirement for use limited resources. Recognizing that many existing availability-limited resources are designed to meet the four-hour minimum duration requirement, the CAISO can identify the maximum amount of such resources in each local capacity area that would effectively address local capacity needs. Setting the maximum amount of four-hour duration resources does not exclude load serving entities from procuring preferred resources or energy storage with durations greater than four hours. The CAISO will include such resources in its local capacity study and consider them in determining whether local capacity requirements are met.

The Moorpark Study provides a template to show how resources with greater duration can meet local capacity needs at higher levels of penetration. In the Moorpark Study, the CAISO identified a need for availability-limited resources⁴ with nine and ten-hour durations. The results of the Moorpark Study can guide procurement in the Moorpark sub-area that is specifically tailored to meet local capacity needs. Indeed, Southern California Edison Company (SCE) indicated that it used the Moorpark Study as a basis for its procurement plan for the Moorpark sub-area and would consult with the CAISO to ensure the procured resources meet the area's local capacity requirements.⁵

⁴ In the Moorpark Study, energy storage resources were studied.

⁵ SCE, Moorpark Sub-Area Local Capacity Requirements Procurement Plan of Southern California Edison Company, Submitted to Energy Division Pursuant to D.13-02-015, p. 10.

The Commission may take a more granular approach across all local areas by considering maximum cumulative capacity (MCC) style “buckets” for resources with different maximum durations. For example, in a particular local area, the Commission could establish local MCC “buckets” for four-, six-, and eight-hour duration resources based on the transmission planning analysis for that local area. However, a more granular approach will likely require greater discussion and assessment to develop an acceptable framework. The CAISO believes this discussion is more appropriate for Track 2 of this proceeding. If the Commission does not adopt the Availability-Limited Resource Proposal in Track 1, the CAISO requests the Commission address the issue in Track 2 with the goal of accepting the CAISO’s transmission planning analysis, developing a framework to account for availability-limited resources, and memorializing this in the resources adequacy rules to guide procurement.

3. Local Capacity Requirements versus the Resource Adequacy Availability Incentive Mechanism (RAAIM)

SCE argues that there is a mismatch between the CAISO-identified availability requirements to meet local capacity needs and the Resource Adequacy Availability Incentive Mechanism (RAAIM) availability assessment hours, which apply to all system and local resource adequacy resources.⁶ The comparison is not appropriate because the RAAIM is a policy designed to incentivize already procured resource adequacy resources to bid to meet system needs consistent with their must offer obligations during the coincident system peak. In addition, RAAIM does not set the capacity amount or attributes that must be procured to meet system needs. The system planning reserve margin is developed with the understanding that forced outages, and other unforeseen deviations will occur and that load shedding is a prudent reliability step under certain circumstances. In contrast, local capacity requirements are designed to ensure there are sufficient resources in a local area to maintain a minimum level of reliability (*i.e.*, no loss of load) under certain defined contingency events.

SCE’s own Moorpark Sub-Area Local Capacity Requirements Procurement Plan clearly recognizes that local capacity resources can have different requirements than system resources.⁷ In the procurement plan, SCE bases its local capacity procurement on the CAISO’s Moorpark

⁶ SCE March 7 Comments, p. 8.

⁷ SCE, Moorpark Sub-Area Local Capacity Requirements Procurement Plan of Southern California Edison Company, Submitted to Energy Division Pursuant to D.13-02-015.

Study, which uses a similar methodology as the CAISO's transmission planning analysis presented in this proceeding.⁸ SCE stated the following in its procurement plan:

The CAISO performed its Moorpark Sub-Area Local Capacity Alternative Study, issued on August 16, 2017, to quantify the amount and determine the characteristics of preferred resources, energy storage, and/or reactive power devices that would be necessary to meet local capacity requirements in the Moorpark sub-area. With reliance upon Preferred Resources that are not available at all hours of the day, CAISO identified a need for energy storage resources with discharge durations of up to nine and ten hours to fully satisfy local capacity requirements. SCE will evaluate offers in its RFP and work with the CAISO to ensure that procured resources meet the LCR need.⁹

SCE did not protest the Moorpark Study findings and never raised concerns that the Moorpark results were not directly aligned with the RAAIM assessment hours. In fact, SCE's procurement plan shows that when the necessary operating characteristics are clearly articulated and understood by load serving entities, this information can help facilitate the efficient procurement of preferred resources and energy storage to meet reliability needs. The CAISO's current proposal is not intended to undo the analysis conducted for the Moorpark Study; rather, it provides similar procurement guidance that should be applied in all local capacity areas and sub-areas.

C. Multi-Year Resource Adequacy Procurement Proposals

1. Support for Multi-Year Local Resource Adequacy Requirements

Based on parties' opening comments, the CAISO believes there is broad support for multi-year local resource adequacy requirements. Review of comments submitted on March 7, 2018, indicates that almost all parties either support a specific multi-year proposal or a willingness to explore some of the proposed solutions in greater detail in Track 2.¹⁰ Few parties directly opposed multi-year local resource adequacy requirements, and some of the objections are more focused on the centralized capacity procurement component of specific proposals rather

⁸ California Independent System Operator, Moorpark Sub-Area Local Capacity Alternative Study, August 16, 2017, http://www.caiso.com/Documents/Aug16_2017_MoorparkSub-AreaLocalCapacityRequirementStudy-PuentePowerProject_15-AFC-01.pdf.

⁹ SCE Moorpark Sub-Area Local Capacity Requirements Procurement Plan of Southern California Edison Company, Submitted to Energy Division Pursuant to D.13-02-015, p. 10.

¹⁰ San Diego Gas & Electric Company (SDG&E) March 7 Comments, p. 4

than *per se* opposition to multi-year local resource adequacy requirements.¹¹

At this time, there is no similar consensus regarding who should conduct multi-year procurement. Some parties advocate for centralized procurement through the CAISO, others support continuing bilateral procurement, while others favor another central procurement entity (such as the utility distribution company).

Given the broad support for multi-year local resource adequacy requirements and the absence of consensus regarding how to administer the requirements, the CAISO agrees with comments submitted by Calpine Corporation (Calpine) and Western Power Trading Forum (WPTF) that advocate for a “least regrets” short-term solution that incorporates multi-year local resource adequacy requirements, while maintaining the current bilateral procurement framework. Specifically, the CAISO continues to believe the Energy Division’s “Solution 2” best balances multi-year resource adequacy needs with procurement risks. Although the proposals also have simple bilateral frameworks,¹² Energy Division’s Solution 2 is the best solution because it ensures full procurement of local area needs for a two-year period. By doing so, Solution 2 ensures that local reliability will be maintained in the short-term while the Commission develops a comprehensive resource adequacy solution in Tracks 2 and 3.

2. Need for Additional Studies to Identify Necessary Resources

The Office of Ratepayer Advocates (ORA) proposes to institute a process that would require the CAISO “to provide studies to identify resources essential for reliability that would determine the basis of the need for the resource, including whether it is capacity, voltage support, or some other need, and address how long the need will persist.”¹³ ORA further states that the current local capacity technical study is a “starting point for identifying reliability needs but it does not capture the information necessary to determine all the resources CAISO would backstop if not procured by a load-serving entity.”¹⁴ However, it is not clear what additional information the CAISO can reasonably provide. The local capacity study (1) provides the local area need, (2) identifies the resources that are eligible to meet the need, and (3) provides effectiveness factors

¹¹ Specifically, the Six Cities objects to proposals suggesting the Commission could develop a centralized capacity procurement that would apply to non-Commission jurisdictional entities.

¹² Including the proposals from the Independent Energy Producers Association (IEP), the Alliance for Retail Energy Markets (AReM) and the Community Choice Aggregator (CCA) Parties.

¹³ ORA March 7 Comments, p. 1 (internal quotes omitted).

¹⁴ *Id.*

to meet the identified need. The local capacity study does not pick which particular resources load serving entities select to meet the identified need. Instead, load-serving entity procurement is designed to meet the need based on a number of factors including cost, local effectiveness, flexible effectiveness, greenhouse gas emissions, and environmental justice. Because meeting local reliability needs is a function of the portfolio of resources procured, the CAISO cannot definitively determine that a specific unit is “essential” until procurement takes place and the CAISO can study the resources actually procured within the local areas. For example, a resource may be essential given one procurement portfolio, but not under another.

ORA points to the CAISO’s recent Reliability Must-Run (RMR) designations as evidence for the need for additional studies. However, the CAISO notes that the Metcalf and Yuba City RMR designations could have been reasonably predicted based on previous local capacity studies. However, given the consequences of the potential RMR designations and the complexities of the Greater Bay area system in particular, the CAISO prudently re-studied those needs before moving forward with RMR designations.

In the Bogue sub-area, ORA notes that the need for the Feather River Energy Center (Feather River) was not identified in the local capacity technical studies. Though true, the Feather River example demonstrates that the additional study proposed by ORA will not necessarily identify necessary resources. The types of studies ORA suggests would not have identified Feather River as a “necessary” resource for a number of reasons. First, the local capacity studies prior to the RMR designation were based on reported power factors that were inaccurate. It was only after the CAISO investigated the apparent reliance on the Feather River generation for voltage control in real-time that it identified these inaccurate power factors. Second, the voltage control issues were exacerbated because Pacific Gas & Electric Company (PG&E) had not performed tap changing that would have helped address the need. Further, additional studies could not have anticipated, years in advance, the delays in constructing CAISO-approved transmission projects that would have mitigated the need for the Feather River facility.¹⁵ Studies—no matter how meticulously conducted—still rely on the best available information at the time and cannot predict every eventuality.

¹⁵ In 2007 the CAISO approved the Rio Oso 230/115 kV Transformer project and in 2012 the CAISO approved the Rio Oso 230 kV Voltage Support project.

ORA also recommends that the CAISO conduct studies many years in advance to identify precisely how long each essential unit would be required. Given that the permitting process represents the largest uncertainty in predicting in-service dates for transmission mitigations, expecting perfect foresight through a study process is unreasonable. In any event, the CAISO's annual transmission planning process, not a local capacity study, is the vehicle by which the CAISO identifies transmission solutions to minimize local capacity needs.

For these reasons, the CAISO does not believe ORA's proposal articulates a study process that would provide probative information that would be useful in the resource adequacy process.

D. ELCC Refinement Proposals

1. Use of Marginal versus Average ELCC Values

The CAISO agrees with SCE, Calpine, and California Wind Energy Association that marginal ELCC values (or "vintaging") "will provide correct incentives for wind and solar development and correct ELCC values for contracting and procurement."¹⁶ The CAISO understands that there are trade-offs with using a marginal ELCC value. For example, as NRG Energy, Inc. (NRG) notes, marginal ELCC calculation would "unduly disadvantages later-developed solar resources."¹⁷ However, using marginal ELCC values would ensure that existing resources do not benefit from a new resource that helps provide diversity benefits.¹⁸ This is not only acceptable, it is desirable. Using the marginal ELCC value encourages load serving entities to procure new resources that are complementary to the existing fleet by assigning such complementary resources a relatively high ELCC value. In contrast, using an average ELCC value would overstate the resource adequacy value of a new resource that is not complementary to the existing fleet.

San Diego Gas & Electric Company (SDG&E) argues that using marginal ELCC values will provide an incentive to maintain old capacity rather than investing in new technologies. Although theoretically possible, this concern is largely based on how marginal ELCC is calculated. Some parties have asserted that marginal ELCC "locks in" a resource qualifying capacity value. The CAISO disagrees and believes marginal ELCC values should be updated on

¹⁶ SCE March 7 Comments, p. 4.

¹⁷ NRG March 7 Comments, p. 13.

¹⁸ ORA also noted this benefit. ORA March 7 Comments, p. 14.

a regular basis and should reflect any degradation of wind and solar resources. The marginal ELCC should reflect the order in which a resource's ELCC is determined relative to other resources, it should not fix qualifying capacity value. Finally, the CAISO notes that new capacity additions and transition to new technologies should primarily be managed through the Integrated Resource Plan.

2. Treatment of Behind-the-Meter Solar For ELCC Calculations

Behind the meter solar penetration can have a significant impact on reliability assessments and the ELCC of other grid connected resources. Calpine argues that behind-the-meter photovoltaic resources “should be reflected in ELCC calculations, either as supply or load-modifying.”¹⁹ The CAISO agrees. Although the majority of parties addressing this issue²⁰ support treating behind-the-meter solar resources as a supply resource and comparable to load, the CAISO believes that multiple approaches are viable. This includes those proposed by Calpine and Energy Division in Rulemaking (R.) 14-10-010. The Commission should select one of these options to ensure that the resource adequacy impact of behind-the-meter solar is reflected in the ELCC study.

E. System Load Forecast Proposal

The CAISO agrees with parties that more analysis is needed prior to using new system load forecasts to set system resource adequacy requirements. Changes to the system load forecast can be discussed in Track 2, where the CAISO can provide a full 12-month analysis with backup data to identify months with relatively greater load variability.²¹ Although proposals to change the planning reserve margin are somewhat similar to the CAISO's proposal during shoulder months, the CAISO's proposal is easier to understand and implement.²² The CAISO's preliminary analysis is based on historical weather driven demand for May, June, and July from 1995 through 2017. Although the CAISO referred to the May 3, 2017 event, the event itself is but one data point in 23 years of historical data, which shows that May and June can experience both winter- and summer-like conditions that the average 1-in-2 system load masks.

¹⁹ Calpine March 7 Comments, p. 12.

²⁰ Including NRG, PG&E, GPI, WPTF, LS Power, and Cogentrix.

²¹ AReM March 7 Comments, pp. 8-9; NRG March 7 Comments, p. 19, PG&E March 7 Comments, p. 10; SCE March 7 Comments, p. 10; SDG&E March 7 Comments, p. 14; and The Utility Reform Network March 7 Comments, p. 6.

²² See proposals from Calpine Corporation, Powerex, and Middle River Power, LLC.

F. Availability Assessment Hours

The CAISO agrees with all parties commenting that the CAISO and the Commission should, to the maximum extent possible, align the availability assessment hours. The CAISO proposed that the Commission do so by reference to the CAISO availability assessment hours as determined through the annual study process and its business practice manuals. The CAISO will provide the availability assessment hours to the Commission each year to inform procurement. As an alternative, the Commission could elect to modify its resource adequacy compliance manual annually to reflect any changing need. The CAISO supports either option.

III. Conclusion

The CAISO appreciates that the Commission and stakeholders have undertaken a serious review of the current resource adequacy construct in Track 1. Though the CAISO believes that incremental progress toward resource adequacy reform can be accomplished through the Commission's Track 1 decision, many of the issues raised will need to be further addressed in Track 2. To that end, the CAISO encourages the Commission to facilitate additional workshops that will allow stakeholders to make continued progress toward comprehensive resource adequacy reform. In particular, the CAISO recommends that the Commission schedule additional workshops in the near-future to address multi-year resource adequacy requirements and procurement, availability-limited resources, and flexible resource adequacy requirements.

Respectfully submitted,

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