

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

Order Instituting Rulemaking to Oversee the Resource Adequacy Program, Consider Program Refinements, and Establish Forward Resource Adequacy Procurement Obligations.

Rulemaking 19-11-009
(Filed November 7, 2019)

INFORMAL COMMENTS ON RESOURCE ADEQUACY FRAMEWORK WORKING GROUP PROCESS OF THE CALIFORNIA INDEPENDENT SYSTEM OPERATOR CORPORATION

I. Introduction

The California Independent System Operator Corporation (CAISO) hereby submits informal comments on the Resource Adequacy Framework Working Group Process (RA Framework). Per the January 20, 2022 email update from the working group co-facilitators, the CAISO submits its completed *RA-Framework-Working-Group_Party-Position_Matrix.xlsx* (Position Matrix) concurrently with these comments.

II. Discussion

A. Rapid Changes to the Resource Mix and Demand Trends Warrant Revisiting the Resource Adequacy Program Structure.

The CAISO balancing authority area resource fleet is rapidly changing to one largely comprised of renewable, storage, and availability-limited resources. Fuel substitution and economy-wide electrification are changing demand profiles, and thus, potentially changing the critical operational periods on the grid. In recent years, the CAISO has experienced challenges managing the system at the net demand peak period when loads remain high and solar generation becomes largely unavailable. As the resource mix and demand trends continue to evolve, resource adequacy program changes will be necessary to ensure reliability.

The Commission should ensure the resource adequacy framework results in load serving entities (LSEs) procuring and showing to the CAISO a resource mix capable of ensuring grid reliability during all hours of the day. To that end, the CAISO proposes attributes the Commission's future resource adequacy program should include to support reliability under rapidly changing supply and demand conditions. These attributes should serve as a guide to help

evaluate slice of day proposals. The CAISO's proposed attributes for the Commission's resource adequacy program include the following:

- Ensuring LSEs show and offer to the CAISO sufficient resources with the right capabilities under a 24x7 must-offer obligation.
 - This is necessary for the CAISO to operationalize the resource adequacy fleet effectively and efficiently to maintain reliability around-the clock. If resources are not subject to a 24 x 7 must offer obligation, they may not be available when the CAISO needs them. The increasing number of energy and use-limited resources can create operational challenges during periods of the day other than the peak.
- The ability to ensure a reliable resource adequacy fleet (*e.g.*, a fleet that can meet a 0.1 loss of load expectation (LOLE) or planning reserve margin (PRM) based on a reliability-based assessment). This includes meeting reliability needs across critical operational periods, under multiple day high load conditions, and other climate change driven risks/events.
 - An LOLE analysis and a one-in-ten year planning standard should be used to establish resource adequacy requirements and determine an appropriate PRM. This is a widely accepted practice and standard for determining resource adequacy. LOLE analyses, such as those based on a stochastic production simulation model, can model hundreds of iterations of full-year hourly chronological simulations. Such detailed modeling can test whether the resource adequacy fleet is capable of maintaining reliability in the face of different and extreme weather events, which may last several hours or days.
- Sufficient flexibility to adapt to the rapidly changing demand and resource mix. The unique challenges presented by the changing demand and resource mix are detailed below.
 - Demand – According to the California Energy Commission's (CEC's) January 2021 demand forecast, the gross peak and net peak demand hours will converge by 2023.¹ Expected future fuel substitution and economy-wide electrification will further change the load shape and potentially change the critical operational periods on the grid.
 - Resources – California is shifting to a resource mix increasingly comprised of variable, use-limited, and availability-limited resources.
 - Between summer 2020 and the end of 2021, the battery storage fleet increased from 500 MW to 2,500 MW.
 - Based on the Proposed Decision in the Integrated Resource Planning proceeding, LSEs are expected to add an additional 2,500 MW of

¹ California Energy Commission, CED 2021 Hourly Forecast - CAISO - Mid Baseline - AAEE Scenario 3 - AAFS Scenario 3 (2021 IEPR forecast). The gross peak occurs by 2023 at hour ending 19 Pacific Standard Time (hour ending 8:00 p.m. Pacific Daylight Time).

battery storage in 2022, increasing to a cumulative 11,300 MW by 2025.²

- This same Proposed Decision indicates LSEs will add 1,000 MW of geothermal resources and 1,000 MW of long-duration storage by 2028.
- Significant dispatchable resource retirements are expected over the next five years as the remaining once-through-cooling gas-fired generation resources reach the end of their compliance extensions.
- The Diablo Canyon Power Plant, which provides significant baseload capacity, will reach its scheduled retirements in 2024 and 2025.
- Resource counting rules that accurately reflect resource availability, including outage rates and use limitations.
 - Resource counting rules should provide a reasonable expectation of the availability of the resource adequacy fleet. Counting rules that appropriately reflect resource availability and use limitations, while providing incentives for resources to be available, can help the Commission and the CAISO avoid relying on resources that may not actually be available when needed in the operating timeframe.
- Sufficient capability to meet both energy and capacity needs, including resources to meet storage charging demand.
 - A significant amount of dispatchable thermal resources will retire, and storage resources are expected to provide the bulk of capacity needed to maintain reliability in the face of these retirements. The resource adequacy program should consider when storage resources will be charged and discharged and assess whether there will be sufficient capability to meet storage charging requirements.
- Contracting sufficient to meet established resource adequacy capacity requirements and minimize CAISO backstop procurement
 - CAISO procurement mechanisms are intended to serve as back-stops to LRA resource adequacy programs, and they should not be relied upon to front-run the Commission's procurement processes.
- Coordination with CAISO's resource adequacy construct, which the CAISO must administer for all local regulatory authorities (LRAs) within its footprint.
 - The Commission should coordinate closely with the CAISO because changes to the Commission's resource adequacy program may affect the CAISO's overall resource adequacy construct. The CAISO must ensure it has a resource adequacy construct that is workable and just and reasonable across all LRAs.

² California Public Utilities Commission, Order Instituting Rulemaking to Continue Electric Integrated Resource Planning and Related Procurement Processes, R.20-05-003, Proposed Decision of ALJ Fitch, <https://docs.cpuc.ca.gov/PublishedDocs/Efile/G000/M434/K547/434547053.PDF>.

B. Gridwell’s Proposal Has Merit, But It May Not Adapt Adequately to Future Demand and Resource Conditions.

Gridwell’s resource adequacy proposal would largely maintain the existing framework, while adding an additional compliance check for the net demand peak hour. Gridwell’s proposal has merit as it addresses reliability needs in the net demand peak period. In recent years, the CAISO has experienced challenges managing the grid at net peak, which currently occurs around 8:00 pm in summer months, when demand remains high but solar resource production is unavailable or minimal. Gridwell’s proposal also appears to be largely compatible with CAISO’s existing resource adequacy construct, which would limit implementation challenges and not disrupt the existing process for other LRAs.

Although Gridwell’s proposal provides reliability benefits—especially in the short-term—those benefits may not be sustainable in the long-term as the demand and resource mix rapidly change. For example, when the gross peak and net demand peak periods converge in 2023, the separate “net peak” check will be obsolete. Additionally, the impacts of fuel substitution and electrification will further change the load shape and potentially change the critical operational periods on the grid outside of the gross peak/net peak period. Gridwell’s proposal does not appear to be flexible enough to capture potential future shifts in critical operating periods and may require a new counting methodology when a new critical operating period is identified in the future

Additionally, Gridwell’s proposal does not ensure sufficient capability to meet storage charging demand. Properly accounting for storage charging will be an important resource adequacy framework attribute with the significant expected increase in storage capacity by 2025.

C. SCE’s Proposal Has Merit, But the Commission Should Consider Additional Design Elements to Implement a Framework Compatible with the CAISO’s Resource Adequacy Program.

SCE proposes a 24-hour slice framework where LSEs show resources to meet demand plus a planning reserve margin across 24 hours of a representative day of the month. SCE’s proposal appears capable of securing both capacity and energy needs under changing supply and demand conditions. Under SCE’s proposal, showings are not required during only select hours of the day, and variable and limited-energy limited resources are shown in hours they are capable

of producing. SCE's proposal also includes storage charging requirements in addition to meeting demand plus a planning reserve margin, ensuring sufficient excess resources will be available to meet storage charging. SCE's proposal provides a more precise energy sufficiency check than the current maximum cumulative capacity (MCC) bucket framework.

Although SCE's proposal has merit, this proposal represents a significant change to the Commission's resource adequacy framework. SCE's proposal likely would not be compatible with the CAISO's existing resource adequacy construct, which is designed to ensure LSEs meet a Commission established demand and reserve margin requirement with sufficient shown capacity. For example, the CAISO may need to modify its systems to include additional hourly validation for each slice of day component. To harmonize the CAISO's processes and systems with SCE's proposal, the CAISO would need to open its own stakeholder process to discuss the relevant tariff changes with other LRAs and market participants. The CAISO anticipates it would have to vet significant changes through its own stakeholder processes to accommodate a slice of day framework like SCE's. The CAISO anticipates it would have to revisit the following CAISO rules and processes, at a minimum, under SCE's proposal:

- Bid insertion rules;
- Outage and substitution rules; and
- Capacity procurement mechanism (CPM) checks, triggers, and cost allocation rules

The CAISO will not be able to complete a stakeholder process and implement resource adequacy tariff and program changes by resource adequacy year 2024. The CAISO, however, recognizes the urgency of resource adequacy reform and commits to working with the Commission and stakeholders to further develop a resource adequacy framework that can be implemented soon after resource adequacy year 2024.

D. Key Slice of Day Design Elements Remain Unresolved.

Stakeholders covered a significant amount of material in the working groups. However, some key design elements to inform a slice of day resource adequacy framework remain unresolved and would benefit from further discussion and development. The CAISO details these unresolved issues below.

1. How the planning reserve margin (PRM) will be set and resource counting methodologies

Resource counting methodologies should be considered in step with determining an appropriate PRM. For example, if wind and solar resources are counted under an exceedance methodology, the level of exceedance affects whether additional uncertainty should be accounted for in the PRM. For thermal resources, the Unforced Capacity (UCAP) approach could be viable for reflecting resource forced outage rates up front in resource counting.³ Embedding forced outage rates in resource counting would offset the need to assume a forced outage rate for those resources in the Commission's planning reserve margin.

2. Ensuring reliability across multiple days

Under the Commission's resource adequacy program, some MCC buckets (although not binding requirements) capture multi-day availability requirements and account to some extent for multi-day reliability events (Demand response bucket and Bucket 1). However, the SCE and Gridwell proposals do not explicitly account for multi-day reliability needs. Many resource use-limitations exist across a month or a year (*e.g.*, starts per month or year, or run hours per month or year). Several demand response programs also have limited calls across a shorter period of time. Although SCE and Gridwell both mention potentially retaining certain MCC buckets, the CAISO believes this design aspect warrants further thought and discussion.

III. Conclusion

The CAISO appreciates the opportunity to provide these informal comments and looks forward to working with the Commission.

Dated: February 7, 2022

³ As detailed in CAISO's presentation on UCAP, a UCAP methodology is compatible with both SCE and Gridwell proposals, Slide 23: https://www.cpuc.ca.gov/-/media/cpuc-website/divisions/energy-division/documents/resource-adequacy-homepage/workshop-9-ucap-proposal_caiso.pdf.