

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

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

Rulemaking 25-10-003

**TRACK 1 PROPOSALS OF THE
CALIFORNIA INDEPENDENT SYSTEM OPERATOR CORPORATION**

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I. Introduction

Pursuant to the *Assigned Commissioner's Scoping Memo and Ruling* (Ruling), issued on December 12, 2025, the California Independent System Operator Corporation (CAISO) hereby submits its Track 1 proposals to the California Public Utilities Commission (Commission).

II. Discussion

A. The Commission Should Establish Resource Adequacy Requirements that Meet a 0.1 Loss of Load Expectation.

The CAISO appreciates the Commission's progress toward adopting Resource Adequacy (RA) requirements that meet a 0.1 loss of load expectation (LOLE) in the predecessor RA proceeding (Rulemaking (R.) 23-10-011). In R.23-10-011, the Commission stated its plans to continue using a 0.1 LOLE standard in future reliability modeling.¹ The Commission also adopted an 18% planning reserve margin (PRM) for 2026-2027 that made incremental progress toward RA requirements that meet this standard.² The Commission should continue striving towards achieving a 0.1 LOLE metric in this proceeding by conducting an LOLE study, determining and publishing PRM levels that will meet a 0.1 LOLE, and adopting RA requirements that meet a 0.1 LOLE for 2028 and 2029.

¹ Commission Decision (D.) 24-12-003, p. 19.

² D.25-06-048, p. 31.

1. The Commission Should Determine and Publish the PRM(s) that Meets a 0.1 LOLE Across the Year for 2028 and 2029.

The CAISO appreciates Energy Division performing LOLE studies to guide party discussions and Commission decision-making on PRMs for the RA program. In its most recent LOLE study, Energy Division determined the PRMs that could meet a 0.16 LOLE when summed across the study year.³ These efforts, however, did not identify the PRM that would meet a 0.1 LOLE across that year.

The Commission should determine and publish the PRM(s) that will meet a 0.1 LOLE for 2028 and 2029. This will ensure the Commission and parties understand the PRM level necessary to meet the 0.1 LOLE reliability standard used in the Commission's RA modeling.⁴

2. The Commission Should Consider Adopting Multiple PRMs.

The Commission should consider adopting multiple PRMs across the year to ensure annual RA requirements meet a 0.1 LOLE. PRMs are set based on the magnitude and variability of load and may also be set considering uncertainty in production of resources such as solar and wind generation. Multiple PRMs across the year allows the Commission to set RA requirements based on the unique load and resource conditions of each time period while still maintaining the industry-accepted reliability standard of 0.1 LOLE across the entire year. Accordingly, the Commission can focus load serving entities' (LSEs) procurement activities on the periods with the greatest reliability need.

B. The Commission Should Clarify the Inputs to its Qualifying Capacity Calculation Methodology for Storage Resources.

In D.14-06-050, the Commission adopted qualifying capacity (QC) rules for storage resources, stating, "[T]he storage operator must submit to the CAISO an output level (in MW) at which the resource is capable of discharging for four or more uninterrupted hours; this is defined to be its P_{maxRA}, the maximum output that can be considered for RA calculations."⁵

³ Energy Division 2026 LOLE study, p. 11, <https://docs.cpuc.ca.gov/PublishedDocs/Efile/G000/M549/K797/549797826.PDF>; Energy Division Revised 2026 LOLE study, p. 8, <https://docs.cpuc.ca.gov/PublishedDocs/Efile/G000/M557/K609/557609748.PDF>.

⁴ D.24-12-003, p. 19.

⁵ D.14-06-050, p. B-9.

The Commission's current QC calculation methodology may not align with its adopted QC counting methodology for storage resources, as the calculation inputs lack clear definition. This ambiguity arises due to nonlinearity, a phenomenon experienced by certain storage technology types whereby the storage resource is no longer capable of discharging at its maximum output level as it approaches its minimum state of charge level. The state of charge level at which a storage resource can no longer discharge at its maximum output level can be defined as the discharge nonlinearity breakpoint.

The Commission should ensure that its QC calculation methodology for storage resources aligns with the Commission's adopted QC counting methodology by clarifying that it uses the discharge nonlinearity breakpoint as an input to its QC calculation methodology. This would align the current QC calculation with the adopted QC counting methodology, as the calculation would incorporate the lowest state of charge level at which the resource can sustain its maximum output in MW for four or more uninterrupted hours.

Absent this clarification, the QC calculation may be inconsistent between storage resources due to varying definitions of QC calculation inputs across resources. By eliminating this potential inconsistency, the Commission can ensure uniform counting of all storage resources' QC, thereby preserving fairness in its RA program and providing the CAISO important operational certainty during stressed grid conditions.

C. The Commission Should Not Impose Restrictions on RA Resources for Day-Ahead Market Bidding and Revenue Eligibility.

The Scoping Memo includes consideration of bidding requirements for three new market products introduced as part of CAISO's Day Ahead Market Enhancements (DAME) initiative: Reliability Capacity Up (RCU), Reliability Capacity Down (RCD), and Imbalance Reserves (IR) (collectively, the DAME Products).⁶ The Commission's Track 3 Proposed Decision in R.23-10-011 considered whether to impose zero-dollar bid requirements for the DAME Products.⁷ The

⁶ Scoping Memo, p. 5. Note that Imbalance Reserves includes two separate products: Imbalance Reserves Up and Imbalance Reserves Down. To be consistent with the Commission's Proposed Decision in the predecessor RA proceeding, CAISO refers to both Imbalance Reserves Up and Imbalance Reserves Down collectively as "Imbalance Reserves" or "IR."

⁷ Track 3 Proposed Decision, R. 23-10-011, p. 84.

Track 3 Proposed Decision also considered a related topic of whether RA resources are eligible to receive any revenues associated with the DAME Products.⁸

The Commission should not impose restrictions on all RA resources for the bidding of, or eligibility to receive revenues from, the DAME Products. Restrictions would risk diminishing the benefits of wholesale market regionalization and reliability. Restricting bidding or revenue eligibility for RA resources may also have detrimental wholesale market and RA capacity market implications that raise costs to ratepayers. Consequently, the Commission should not apply bidding or revenue clawback rules for the DAME Products to the RA resource fleet.

Instead of imposing a regulatory contracting directive, the Commission should recognize that LSEs can negotiate revenue allocations in RA contracts as they see fit. This approach received support from parties representing both suppliers and LSEs in comments on the Track 3 Proposed Decision.⁹ Parties supported this approach for various reasons, including the flexibility it affords contracting parties to negotiate according to their individual situation. By allowing LSEs and suppliers to negotiate revenue allocation requirements during RA contract negotiations, the Commission can avoid risk that suppliers are compensated twice for the same services. During RA contract negotiations, it is in the interest of LSEs to ensure suppliers are not compensated multiple times for the same service.

1. Restrictions on DAME Product Bidding and Revenue Eligibility Risks Diminishing Regionalization and Reliability Benefits.

The DAME Products are critical pieces of the regional wholesale market design. Each product will be cleared across the entire Extended Day Ahead Market (EDAM) footprint, rather than on a balancing area-specific level, allowing optimization across all EDAM balancing authorities. This ensures the least cost resource provides the flexibility or reliability services. Optimizing these products across a wider geographic footprint creates a diversity benefit by which all EDAM balancing areas, including the CAISO balancing area, receive these services at a lower cost than they would on a balancing area-specific basis.

⁸ *Id.*

⁹ See California Energy Storage Alliance Opening Comments on Track 3 Proposed Decision, R. 23-10-011, p. 20; California Community Choice Association Opening Comments on Track 3 Proposed Decision, R. 23-10-011, p. 15; AES Corporation Opening Comments on Track 3 Proposed Decision, R. 23-10-011, p. 6.

Introduction of the DAME Products will also serve crucial reliability functions and generate market efficiencies to ratepayers' benefit. First, the RCU product will replace the existing product cleared in CAISO's current residual unit commitment (RUC) market that enables sufficient resources to be positioned in the day-ahead timeframe to reliably meet forecasted demand. Second, the RCD product will provide reliability benefits by introducing downward flexibility into the market and helping address potential oversupply conditions in the real-time market. Third, IR will help address net load uncertainty issues and set aside capacity for resources to provide ramping capacity in the real-time market, further supporting reliability. IR will also make embedded net load uncertainty costs transparent, allowing the EDAM market to efficiently optimize these costs.

Requiring bidding restrictions for the DAME Products risks diminishing the potential for California ratepayers to realize regionalization benefits. If all CPUC-jurisdictional RA resources are required to bid zero dollars for the DAME Products, they will be the first resources called upon to provide flexibility and reliability duties, regardless of the true cost these resources incur to provide these duties. However, other resources in the EDAM area with no zero-dollar bid requirement may be able to provide the flexibility or reliability services at a lower true cost than the CPUC-jurisdictional RA resource fleet. Imposing a fleet-wide zero-dollar bid requirement thereby decreases the likelihood that the EDAM market can provide flexibility and reliability services from the resources capable of providing these services at the lowest true cost across the EDAM area. Over time, the lack of appropriate price signals for flexibility and reliability services may discourage resources across the EDAM area from developing capabilities to provide these services more cost-effectively, diminishing the longer-term benefits of regionalization.

The Commission imposing bidding or revenue eligibility restrictions across the entire RA fleet may also risk the reliability benefits from the DAME Products. An influx of bids for the RCU and RCD products that do not reflect the true costs of the product may distort unit commitment, meaning the RUC market may designate one set of resources to be available for dispatch in the real-time market when a more reliable and cost-effective set of resources may have been designated instead. The sub-optimal fleet created by distorted unit commitment can leave the real-time market with fewer reliable options to meet forecasted demand, potentially impacting reliability. Similarly, bidding or revenue eligibility restrictions will limit the ability of

the integrated forward market (IFM) to differentiate which resources can best meet net load uncertainty, leading to the IFM awarding IR to resources with less beneficial flexibility attributes. This can result in fully awarding resources with better ramping capabilities for products other than IR, leaving these resources less able to provide ramping capacity when CAISO needs these resources' ramping capabilities to operate the system reliably.

2. Restrictions on DAME Product Bidding and Revenue Eligibility Will Put Upward Pressure on Ratepayer Costs.

Bidding and revenue allocation requirements imposed on the RA resource fleet also pose the risk of higher wholesale and capacity market costs.

A significant percentage of zero-dollar bids for the DAME Products may distort IFM and RUC results, potentially resulting in higher wholesale market costs. As described above, absent an appropriate price signal for RCU and RCD, resource commitment may be distorted in RUC. If RUC commits a sub-optimal set of resources, it can result in uncommitted resources not being available to the real-time market, potentially requiring the real-time market to meet forecasted load with more costly resources. Similarly, having a substantial portion of zero-dollar IR bids will limit the market's ability to effectively evaluate opportunity costs, increasing the total production costs of the system.

Imposing revenue eligibility requirements may also result in similar inflated wholesale market costs, as this would remove the incentive for RA resources to bid the underlying costs of the DAME Products. Suppliers are incentivized to bid actual costs into the CAISO wholesale market to avoid not recovering costs if bids are too low and avoid foregoing revenues if bids are too high. If DAME Product market revenues become irrelevant to RA resources' bidding choices, the incentives for RA resources to bid actual costs evaporate, diminishing the likelihood that their bids provide the appropriate signals to the market and hampering the ability of the market to optimize resources appropriately.

The Commission requiring zero-dollar bids for the DAME Products may also put upward pressure on RA capacity prices for CPUC-jurisdictional LSEs. RA resources subject to bidding or revenue eligibility restrictions for the DAME Products will still incur the costs associated with providing those services. If the CPUC suppresses bids or confiscates DAME Product revenue, suppliers may choose to increase their RA contract prices to recover those costs, creating an unlevel playing field in which CPUC-jurisdictional LSEs are at a competitive disadvantage

compared to LSEs in jurisdictions that allow them to retain DAME Product revenues. Also, imposing bidding restrictions would limit the opportunity for RA resources to provide the DAME Products to other balancing areas. This could sacrifice a revenue stream for RA resources, thereby eliminating the potential for the associated savings to be passed through to CPUC-jurisdictional LSEs in the form of lower RA capacity prices.

III. Conclusion

The CAISO appreciates the opportunity to submit Track 1 proposals. The CAISO looks forward to collaborating with the Commission and parties to further develop the CAISO's proposals and enhance the RA program.

Respectfully submitted,

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