

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

Order Instituting Rulemaking to
Continue Oversight of Electric
Integrated Resource Planning and
Procurement Processes.

Rulemaking 25-06-019

**OPENING COMMENTS OF THE
CALIFORNIA INDEPENDENT SYSTEM OPERATOR CORPORATION**

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I. Introduction

The California Independent System Operator Corporation (CAISO) submits opening comments on the August 31, 2026 *Administrative Law Judge’s Ruling Seeking Comments on Electricity Portfolios for the 2027-2028 Transmission Planning Process and Potential for Geographically Targeted Procurement* (Ruling). The resource portfolios adopted in this proceeding play a critical role in informing the CAISO’s transmission planning process (TPP) and guiding long-term investments needed to maintain reliability and support California’s clean energy goals.

The CAISO generally supports the Ruling’s recommended base case and Limited Out-of-State Sensitivity portfolio. However, the CAISO notes that achieving long-term reliability and policy objectives depends on the timely development of a diverse resource portfolio. Therefore, the CAISO recommends the Commission maintain flexibility for long-term resource and transmission development to ensure that long lead-time resources are available when needed to support resource diversity and system reliability. This flexibility should extend to emerging out-of-state resource and transmission opportunities, with the Commission considering information provided through economic study requests and the CAISO’s interregional transmission planning and coordination processes. The CAISO also recommends the Commission provide clear and consistent planning and procurement signals for out-of-state resources. Lastly, the CAISO recommends future portfolios preserve resource diversity and support reliability attributes necessary to support system needs.

The CAISO also clarifies its recommendation for storage procurement in the Western LA Basin and explains the basis for this recommendation.

II. Discussion

A. The CAISO Generally Supports the Ruling's Recommended Base Case Portfolio.

The CAISO appreciates Energy Division staff's efforts to develop the proposed portfolios for study in the CAISO's 2027-2028 TPP. The CAISO generally supports the recommended base case portfolio. The base case portfolio reflects current realities of resource and transmission development and presents a reasonable approach to addressing key policy changes. However, the CAISO expresses concern that changes in this portfolio relative to previous cycles' portfolios can have a compounding effect on total resource requirements and create uncertainty for resource and transmission planning. This uncertainty could delay resource and transmission development, increasing the risk that resources and infrastructure will not be available on the timelines needed to support reliability.

Relative to the 2026-2027 TPP portfolio, the recommended base case portfolio assumes a greater level of resource development, particularly solar and storage resources. At the same time, the portfolio reflects delays in the availability of geothermal and wind resources, resulting in approximately 2 gigawatts (GW) and 3 GW less geothermal and wind in 2030 and 2035, respectively, compared to the 2026-2027 TPP portfolio.

The underlying assumptions driving increased near-term build rates for solar and storage and delayed availability of geothermal and wind reasonably reflect current development realities and the longer lead-time associated with those resources. The CAISO generally supports the proposed base case because it reflects a pragmatic assessment of current resource development trajectories while continuing to advance policy objectives. However, while increased near-term deployment of solar and storage resources is likely necessary to meet reliability needs, achieving long-term reliability and policy objectives will depend on the timely development of a diverse resource portfolio. In particular, increased diversity and clean firm and dispatchable resources will play an important role in providing operational flexibility and reliability attributes needed to support the grid as conventional resources retire and demand increases.

B. The CAISO Supports the Ruling’s Recommended Limited Out-of-State Resources Sensitivity Portfolio as a Means to Examine Transmission Implications of a Less Diverse Portfolio.

The CAISO supports adoption of the proposed Limited Out-of-State Resources Sensitivity portfolio for study in the 2027-2028 TPP. As the Ruling explains, the purpose of studying a sensitivity portfolio is to examine transmission implications.¹ The recommended sensitivity portfolio restricts development to transmission facilities already in service or under contract for out-of-state resource delivery. As a result, the portfolio places substantially greater reliance on in-state resource development to meet system needs.

Given the uncertainty associated with the timing and availability of generic out-of-state resources, the CAISO recognizes the need to assess the feasibility of substantial in-state resource development in place of generic out-of-state resources. This sensitivity portfolio will provide valuable information regarding the transmission implications of a less diverse resource portfolio stemming from reduced access to out-of-state resources.

C. The Commission Should Maintain Flexibility for Long-Term Resource and Transmission Opportunities.

The CAISO recognizes the challenges in resource planning given many uncertainties, including those associated with out-of-state resource and transmission development. Nevertheless, many of the resources expected to contribute to reliability and policy objectives at least cost in the 2030s and beyond require substantial development timelines. Preserving flexibility during resource portfolio development and providing clear procurement signals are important to preserve resource diversity and support long-term reliability.

1. The Commission Should Maintain Flexibility to Accommodate Emerging Out-of-State Resources Opportunities.

To reflect longer development timelines, the current portfolio delays assumed availability of generic out-of-state wind and geothermal resources until 2037 and 2042, respectively.² Consequently, compared to the 2026-2027 TPP portfolio, the current portfolio selects

¹ *Administrative Law Judge’s Ruling Seeking Comments on Electricity Portfolios for the 2027-2028 Transmission Planning Process and Potential for Geographically Targeted Procurement*, p. 27.

² 2027-2028 Transmission Planning Process RESOLVE Modeling Results, slide 8.

approximately 2 GW less out-of-state wind and geothermal capacity in 2030 and approximately 3 GW less out-of-state wind and geothermal capacity in 2035.³

The CAISO understands the rationale for these adjustments. However, future planning cycles should retain the flexibility to incorporate out-of-state wind and geothermal resources that may become available earlier than the timelines currently assumed in this portfolio. This flexibility will allow portfolios to capture emerging opportunities as resource and transmission development advances in the West, especially as interest in interregional transmission planning continues to grow and associated uncertainty continues to diminish. This would also ensure continued access to a more diverse resource mix.

Several transmission developments currently under study could provide access to geothermal and wind resources sooner than reflected in existing portfolio assumptions. For example, RESOLVE modeled the High West and Greenlink West transmission projects for the first time in the 2027-2028 integrated resource planning (IRP) cycle to support the delivery out-of-state enhanced geothermal systems (EGS). As a result, 2,000 MW of Utah EGS were introduced into the portfolio beginning in 2032 and assumed to be delivered through the High West project.⁴ At the same time, the CAISO's 2026 TPP Study Plan identifies several interregional transmission projects that the CAISO will study during the 2026-2027 TPP, including the Silver Rock transmission project, which would provide access to Utah geothermal and Wyoming wind as early as 2031.⁵ CAISO recommends the Commission consider information derived from both the economic study requests and the CAISO's interregional transmission planning and coordination activities.

Additionally, the CAISO is exploring transmission opportunities that could facilitate access to resources in the broader Western region in light of the findings from the Western Transmission Expansion Coalition's (WestTEC) West-Wide Transmission Study 10-Year Horizon Report.⁶ Such evaluations, in coordination with other western planning regions, could potentially result in effective and mutually beneficial interregional transmission solutions to

³ 2027-2028 Transmission Planning Process RESOLVE Modeling Results, slide 9.

⁴ *Administrative Law Judge's Ruling Seeking Comments on Electricity Portfolios for the 2027-2028 Transmission Planning Process and Potential for Geographically Targeted Procurement*, p. 8.

⁵ 2026-2027 Transmission Planning Process Unified Planning Assumptions and Study Plan, p. 94.

⁶ West-Wide Transmission Study: 10-Year Horizon Report.
https://www.westernpowerpool.org/private-media/documents/WestTEC_10-year_Full_Report.pdf.

access out-of-state resources. Assessing transmission opportunities in the broader Western region also provides the CAISO opportunity to build upon significant transmission development currently underway, enabling access to out-of-state resources such as the SWIP-N transmission project. The CAISO recommends the Commission consider including other Western states, including Montana, as potential resource locations for the 2027-2028 planning cycle and future planning cycles, as appropriate, given regional interest and collaboration opportunities as opposed to limiting to current locations such as Wyoming, Idaho, and New Mexico.

2. Consistent Planning and Procurement Signals are Needed for Out-of-State Resources.

As with other long lead-time reliability resources, development of out-of-state resources and associated transmission infrastructure depends on sufficient planning certainty and clear procurement expectations. The quantity and timing of out-of-state resources assumed in the portfolio has varied across successive TPP resource portfolios. Although these changes reflect uncertainty regarding resource and transmission development, significant shifts in portfolio assumptions can compound uncertainty and create challenges for transmission planning, project development, and procurement activities.

Because Commission portfolios form the basis of CAISO transmission planning, step changes to out-of-state resource assumptions can create misalignment between resource planning and transmission planning.⁷ Apart from the uncertainty such out-of-state portfolio step changes create for transmission planning and for stakeholders, this also impacts interregional transmission projects submitted to the CAISO and corresponding evaluations which are coordinated with other western planning regions, as such projects are submitted only on a biennial basis (every even year) for joint evaluations by the western planning regions.

The CAISO evaluates and approves transmission projects based on the resource portfolios provided through the IRP process, including transmission facilities intended to provide

⁷ For example, the Wyoming wind to Tesla has decreased significantly from 4,000 MW in the 2026-2027 TPP cycle to 1,000 MW proposed in the 2027-2028 Ruling; proposed remapping of significant amounts of out-of-state wind resources from Palo Verde to Eldorado in 2027-2028 Ruling despite specified constraints being present in the current 2026-2027 TPP cycle as well, and proposed increase of 3,000 MW Wyoming wind to Lugo in the 2027-2028 ALJ Ruling. Similarly, for Geothermal, as an example, there is a decrease in Malin Geothermal because of lack of commercial interest in the 2027-2028 Ruling which is understandable, but this constraint was also present during resource portfolio development for the 2026-2027 TPP cycle.

access to out-of-state resources. However, within the IRP modeling process, approved transmission projects associated with out-of-state resources are reflected as prospective costs in RESOLVE, while the modeled quantities and timing of out-of-state resources continue to fluctuate across planning cycles. This dynamic creates challenges in maintaining alignment between resource planning assumptions and transmission investments approved to support those resources. It also increases uncertainty regarding the long-term utilization of transmission facilities and the resources they are intended to enable. In this regard, the CAISO recommends that transmission projects approved to access out-of-state resources be treated consistently with the treatment of transmission projects approved to access in-state resources.

The TransWest Express (TWE) project illustrates the importance of clear and consistent planning assumptions regarding out-of-state resources. In December 2022, the CAISO Board of Governors approved TWE application to become a participating transmission owner (PTO) and join the CAISO's Balancing Authority Area. The project was approved to deliver Wyoming wind resources into California under the Subscriber Participating Transmission Owner (SPTO) framework, where project costs are recovered through subscriptions from participating generators rather than through the Transmission Access Charge (TAC). The success of this approach depends on sufficient confidence that the underlying resources will continue to play a meaningful role in California's long-term planning and procurement framework.

The CAISO also notes that uncertainty regarding the timing and future role of out-of-state resources affect investment decisions by developers and load-serving entities (LSEs). Given the long development timelines associated with both transmission facilities and out-of-state resources, greater clarity regarding the expected role of these resources is needed to help support resource development and improve alignment between resource planning assumptions, transmission planning activities, and procurement decisions.

Therefore, the CAISO recommends the Commission provide a clear and consistent planning and procurement framework for out-of-state resources. Greater certainty regarding the long-term role of these resources will help support the development of both the resources and transmission infrastructure needed for reliability and meet the state's clean energy objectives.

D. Future Portfolios Should Better Preserve Resource Diversity and Reliability Attributes.

California's resource portfolios rely on resources that require substantial development lead times, including out-of-state wind, geothermal resources, clean firm resources, and the transmission infrastructure needed to support them that have not aligned with the resources that have come online or are under contract to come online. Ensuring these resources are available when needed will require earlier procurement signals and a clear long-term development framework.

1. Clean Firm, Dispatchable, and Long Lead-Time Resources Require Earlier Procurement Signals.

The CAISO recognizes the proposed base case portfolio reflects current expectations regarding resource and transmission development timelines. At the same time, the CAISO notes the portfolio relies on significant near-term solar and storage procurement, while much of the clean firm and dispatchable resources, such as geothermal and wind, are deferred until later in the planning horizon.

As California's resource needs evolve, developing a diverse portfolio of resource attributes will become increasingly important to supporting reliable grid operations and long-term policy objectives. Today, California's evening ramp is still largely supported by firm and dispatchable conventional resources that can respond to changing system conditions and serve demand during periods when solar production falls. Looking ahead, the ongoing retirement of firm conventional resources, combined with increasing demand, including from transportation and building electrification, is expected to increase the need for clean firm and dispatchable resources capable of providing similar operational characteristics.

Long lead-time resources, including clean firm and dispatchable and out-of-state resources, are an important component of the Commission's long-term resource plans and are expected to contribute to reliability and policy objectives in the 2030s and beyond. However, uncertainty regarding the timing and quantity of long lead-times resources reflected in successive IRP cycles, coupled with limited procurement activity of these resources, may affect the ability of these resources to achieve commercial operation on the timelines assumed in the planning portfolios.

Although several LSEs have identified long lead-time resources in their individual IRPs, planning efforts without assurances of procurement may not provide sufficient market certainty to support timely resource development.⁸ Therefore, the CAISO urges the Commission to conduct a need determination analysis for long lead-time resources and establish procurement requirements sufficient to support their timely development. Earlier and consistent procurement signals will help ensure the resources assumed in future portfolios are available when needed and reduce the risk of a disconnect between planning assumptions and actual resource availability.

2. The Growing Share of Energy-Only Solar Resources in the Portfolio Warrants Additional Evaluation.

The CAISO also notes the increasing share of energy-only solar resources in the portfolio relative to previous cycles' portfolios. By 2037, energy-only resources comprise 45 percent of the selected solar resources.⁹ This represents a substantial increase relative to the current resource mix and may have important operational and planning considerations that warrant further evaluation. As energy-only resources comprise a growing percentage of total solar capacity in the base case portfolio, additional analysis is needed to better understand their ability to support reliability objectives.

Unlike resources with full capacity deliverability status (FCDS), energy-only resources are not evaluated for their ability to deliver energy under stressed grid conditions. As reliance on energy-only solar resources increases, understanding their ability to reliably serve demand and support storage charging becomes increasingly important.

The CAISO is currently conducting its 2026-2027 TPP Reliability Assessment study of the baseline scenario for the summer off-peak base cases and will publish the preliminary results and solicit feedback in November 2026.¹⁰ This analysis is expected to provide information as to whether energy-only resources can reliably and sufficiently charge storage resources.

⁸ Ava Community Energy Authority, Central Coast Community Energy, Southern California Edison Company (SCE), Marin Clean Energy, Sonoma Clean Power Authority, CleanPowerSF, San Jose Clean Energy, Pacific Gas and Electric Company, San Diego Gas & Electric Company, Silicon Valley Clean Energy, Clean Power Alliance of Southern California, Peninsula Clean Energy Authority, and the Regents of the University of California all included out-of-state wind in their conforming portfolios.

⁹ 2027-2028 Transmission Planning Process RESOLVE Modeling Results, slide 78.

¹⁰ CAISO, *Reply Comments on the Proposed Decision Adopting Local Capacity Obligations for 2027-2029, Flexible Capacity Obligations for 2027, and Program Refinement*, R. 25-10-003, pp. 3-4.

The CAISO looks forward to continuing to work collaboratively with the Commission and stakeholders to evaluate the ability of energy-only resources to serve load and sufficiently charge storage resources under stressed grid conditions. The CAISO encourages further consideration of the implications associated with a portfolio that increasingly relies on energy-only resources and the extent to which such an approach differs from California's traditional planning framework, which has relied on demonstrated deliverability to support reliability objectives.

E. The CAISO Supports Geographically-Targeted Storage Procurement for the Western LA Basin.

The CAISO recommends that the Commission issue a procurement order for 2,405 MW or 12,075 MWh to be online by the second quarter of 2032.

As explained in the Ruling, the CAISO canceled the Del Amo-Mesa-Serrano 500 kV project in its 2025-2026 Transmission plan because of substantial cost increases.¹¹ The CAISO approved the project originally to address south of Mesa corridor constraints and Serrano-Barre corridor constraints that were impacting policy-driven capacity resource deliverability. At the time of approval, the project had a total cost estimate of \$1.125 billion. During the 2025-2026 TPP, SCE informed the CAISO the updated cost estimate had increased to \$5 billion.¹²

In response, the CAISO reevaluated the need for the project and identified viable alternative solutions capable of addressing reliability needs. The CAISO approved the Mesa-Laguna Bell 230 kV #2 Upgrade project as a reliability-driven project to address the reliability need expected for the Western LA Basin that was previously met by the canceled Serrano-Del Amo-Mesa 500 kV project. The CAISO also evaluated several potential solutions for addressing the reliability needs in combination with the Mesa-Laguna Bell 230 kV #2 Upgrade project. These included: (1) additional storage procurement above the amount in the 2025-2026 TPP portfolio mapped to the Western LA Basin; (2) a new reliability-driven transformer at the Mesa substation, with an estimated cost ranging from \$106 million to \$126 million; and (3) a high-voltage direct current line into the Western LA Basin for which a cost estimate is not yet available.

¹¹ *Administrative Law Judge's Ruling Seeking Comments on Electricity Portfolios for the 2027-2028 Transmission Planning Process and Potential for Geographically Targeted Procurement*, p. 3.

¹² CAISO 2025-2026 Transmission Plan, p. 109.

Ultimately, in the 2025-2026 Transmission Plan, in addition to the Mesa-Laguna Bell 230 kV #2 Upgrade project, the CAISO recommended coordinating with the Commission to secure additional storage resources above the amount in the 2025-2026 TPP portfolio mapped to the Western LA Basin. The CAISO identified this as its preferred approach among the three potential solutions because the storage resources are already reflected in the planning portfolio and are under development. In addition, this solution aligns planned resource development with existing transmission infrastructure and supports a more integrated approach to resource planning, transmission planning, and procurement.

The Ruling identified 2,900 MW or 2,336 MWh of storage to be online by the second quarter of 2032 as CAISO's recommendation for storage procurement.¹³ The CAISO clarifies that the procurement amount of 2,900 MW or 2,336 MWh is not the amount the CAISO recommended in the 2025-2026 Transmission Plan. In the 2025-2026 Transmission Plan, the CAISO recommended additional procurement of 2,405 MW or 12,075 MWh of storage resources in the Western LA Basin to address reliability need and meet policy-driven deliverability needs by 2032.¹⁴

Of the alternatives the CAISO evaluated, the storage procurement is the only solution capable of addressing the 2032 reliability need on the required timeframe. Although the CAISO examined a new transformer at the Mesa substation as a potential alternative to the storage procurement as part of the 2025-2026 Transmission Plan, SCE has recently stated that it does not expect the new transformer at the Mesa substation to be in-service until June 30, 2034.¹⁵ As a result, relying on that transmission upgrade alone would leave a two-year gap between the identified 2032 reliability need and the availability of the transmission solution, creating an unaddressed reliability risk during that time period.

While the need for additional storage procurement is a consequence of the cancellation of the Serrano-Del Amo-Mesa 500 kV project, the CAISO's analysis also indicates that as load continues to increase in the Western LA Basin area, storage resources and additional transmission development will be needed to address longer-term future reliability and

¹³ *Administrative Law Judge's Ruling Seeking Comments on Electricity Portfolios for the 2027-2028 Transmission Planning Process and Potential for Geographically Targeted Procurement*, p. 34.

¹⁴ CAISO 2025-2026 Transmission Plan Presentation, slides 59-61.

¹⁵ Proposed SCE Reliability Transmission Projects, 2026-2027 Transmission Planning Process Stakeholder Meeting, slide 15.

deliverability needs. Storage therefore serves as the most viable solution for meeting both the 2032 reliability need and as a resource to support reliability under long-term transmission scenarios.

III. Conclusion

The CAISO appreciates the opportunity to provide opening comments on the Ruling.

Respectfully submitted

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