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

COMMENTS OF THE CALIFORNIA INDEPENDENT SYSTEM OPERATOR CORPORATION ON ADMINISTRATIVE LAW JUDGE'S RULING SEEKING COMMENTS ON BUSBAR MAPPING OF ELECTRICITY RESOURCE PORTFOLIOS FOR 2027-2028 TRANSMISSION PLANNING PROCESS

Roger E. Collanton
General Counsel
William H. Weaver
Assistant General Counsel
Marissa Mercado
Counsel
California Independent System Operator Corporation
250 Outcropping Way
Folsom, CA 95630
Tel: 916-963-0521
Fax: 916-608-7222
Email: mmercado@caiso.com

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I. Introduction

The California Independent System Operator Corporation (CAISO) submits comments on the October 12, 2026 *Administrative Law Judge's Ruling Seeking Comments on Busbar Mapping of Electricity Resource Portfolios for 2027-2028 Transmission Planning Process* (Ruling). The CAISO has reviewed the preliminary 2027-2028 busbar mapping materials provided by California Public Utilities Commission (Commission) staff and posted on the Commission's website.[1]

The CAISO's comments focus on the treatment of battery energy storage resources in the Western LA Basin. In this proceeding, the Commission is separately considering whether to order geographically targeted procurement in the Western Los Angeles (LA) Basin following the cancellation of the Del Amo-Mesa-Serrano 500 kilovolt (KV) transmission project in the CAISO's 2025-2026 Transmission Plan. The Commission's busbar mapping assumptions and its consideration of geographically targeted procurement are closely related, as the resources

[1] See, https://www.cpuc.ca.gov/industries-and-topics/electrical-energy/electric%20power-procurement/long-term-procurement-planning/2024-27-irp-cycle-events%20and-materials/assumptions-for-the-2027-2028-tpp.

mapped in Commission portfolios directly inform the transmission and non-wires solutions the CAISO evaluates through its Transmission Planning Process (TPP).

The Commission has consistently mapped substantial quantities of battery storage resources to the Western LA Basin, both in the portfolio the CAISO is currently studying in its 2026-2027 TPP and in the Commission's preliminary busbar mapping for the 2027-2028 TPP in this proceeding. Where mapped storage allows the CAISO to avoid or defer significant transmission investment, there must be a reasonable and supportable expectation that the storage will develop in the locations and quantities necessary to meet the identified system need. The CAISO's comments therefore provide additional information regarding its Western LA Basin reliability analysis from its 2025-2026 Transmission Plan, the transmission alternatives that may otherwise be necessary if the Commission does not order storage procurement, and the importance of aligning busbar mapping assumptions with resource development.

If the Commission determines that a portion of the storage need identified in the CAISO's analysis includes resources sufficiently certain to develop when and where needed without additional procurement direction, the Commission need not order procurement of the full amount of storage identified in the CAISO's analysis. The CAISO recommends the Commission authorize geographically targeted procurement sufficient to address any remaining portion of the identified need that is not reasonably expected to materialize without additional procurement direction. The Commission should also ensure its procurement determinations and busbar mapping assumptions are consistent. If the Commission determines that storage development at the scale assumed in the CAISO's analysis is not feasible, economic, or otherwise appropriate, it should reflect that determination in the quantity of storage the Commission maps to the Western LA Basin in future TPP portfolios.

II. Discussion

A. CAISO Analysis Identifies a Need for 2,405 MW and 12,075 MWh of Additional storage in the Western LA Basin.

In its 2025-2026 Transmission Plan, the CAISO canceled the Del Amo-Mesa-Serrano 500 kV transmission reinforcement project due to substantial cost increases. In opening and reply comments on the Ruling addressing geographically targeted procurement, the CAISO explained that its analysis identified a need for 2,405 megawatts (MW) and 12,075 megawatt-hours (MWh)

of storage resources in the Western LA Basin.[2] The CAISO provides additional explanation here regarding the basis for that determination.

Without the Del Amo-Mesa-Serrano 500 kV transmission reinforcement project, the CAISO identified thermal overloads on multiple 230 kV facilities in the high-density urban load area under Category P0, P1, P2, P3, P4, P6, and P7 contingencies in various baseline and sensitivity scenarios (B1, B3, B4, B5, B6, S2).[3] The CAISO performed additional power flow analysis to determine whether energy storage located within the Western LA Basin load pocket could be adequately charged and subsequently discharged to offset local capacity deficiencies and mitigate the identified overloads throughout the summer peak day during contingency conditions. The analysis determined that the Mesa transformer banks provide sufficient load-serving capability to charge additional storage resources and appropriately located storage could address the identified local capacity deficiencies through 2035.[4]

Based on information from the Commission, Southern California Edison Company (SCE), and non-Commission jurisdictional participating transmission owners, the CAISO modeled 2,775 MW of existing and in-development storage resources in the Western LA Basin to address the Mesa AA banks constraint. Of that amount, 370 MW represented existing storage resources. The remaining 2,405 MW represents the additional storage capacity reflected in the analysis, consisting of 2,167 MW of resources defined and identified in the Commission's 2025-2026 TPP portfolio; 213 MW of in-development projects identified through information provided by participating transmission owners; and 25 MW of in-development resources identified by the CAISO that are not Commission-jurisdictional.[5]

The CAISO's 2025-2026 TPP analysis also assessed the MWh of storage necessary to address the identified reliability need. The modeled 2,775 MW of storage resources represented 11,189 MWh of capacity.[6] The analysis determined that an additional 2,366 MWh of storage

[2] CAISO Opening Comments on Administrative Law Judge's Ruling Seeking Comments on Electricity Portfolios for the 2027-2028 Transmission Planning Process and Potential for Geographically Targeted Procurement, p. 9; CAISO Reply Comments on Administrative Law Judge's Ruling Seeking Comments on Electricity Portfolios for the 2027-2028 Transmission Planning Process and Potential for Geographically Targeted Procurement, p. 7.

[3] 2025-2026 Transmission Plan, pp. 74-75.

[4] 2025-2026 Transmission Plan, p. 74; 2025-2026 Transmission Planning Process Stakeholder Meeting Presentation, slide 59.

[5] 2025-2026 Transmission Planning Process Stakeholder Meeting Presentation, slide 61.

[6] *Id*., slide 60.

resources was needed to address local capacity deficiencies, resulting in a total modeled requirement of 13,555 MWh.[7] After accounting for 1,480 MWh of storage resources already commercially operational in the region, the CAISO identified a remaining need of 12,075 MWh.[8] The CAISO analysis therefore identifies 2,405 MW *and* 12,075 MWh as the additional storage needed to mitigate the identified reliability concerns in the Western LA Basin.

Importantly, these quantities represent an identified system need, they do not necessarily represent the amount of new procurement the Commission should order. In determining the amount of geographically targeted procurement to order, the Commission should consider how much of the storage identified in the CAISO analysis as baseline or in-development can reasonably be expected to materialize without additional procurement direction. The CAISO notes the Commission's 2025-2026 TPP portfolio identified 1,257.6 MW of 4-hr battery resources and 10 MW of 8-hr battery resources as either baseline in-development or portfolio in-development resources in the Western LA Basin at the Alamitos, Barre, Chevmain, Del Amo, El Nido, El Segundo, Ellis, Hinson, Huntington Beach, Johanna, La Cienega, Laguna Bell, Lighthipe, Mesa, Redondo, and/or Rio Hondo substations, which are the substations listed in the Administrative Law Judge's Ruling Seeking Comments on Electricity Portfolios for the 2027-2028 Transmission Planning Process and Potential for Geographically-Targeted Procurement.[9]

If there is a portion of the identified need that the Commission determines is sufficiently certain to materialize, that may appropriately reduce the procurement order. Resources with uncertain development prospects should not be treated as equivalent to resources backed by sufficient commercial commitments or procurement obligations when assessing whether the identified reliability need will be met. Therefore, the CAISO recommends the Commission authorize geographically targeted procurement sufficient to address any portion of the identified Western LA Basin storage need that the Commission determines is not reasonably expected to materialize without additional procurement direction.

[7] *Id*., slide 59.
[8] *Id*., slide 61.
[9] Final Dashboard for the 25-26 TPP Base Case.

B. Absent Sufficient Storage Development, Significant Transmission Upgrades May Be Needed.

1. Reliability-Driven Transmission Upgrade Alternatives

The CAISO's reliance on storage in the Western LA Basin avoided the need to pursue substantial transmission infrastructure that would otherwise be necessary to address the identified reliability concerns. If sufficient storage does not materialize, the CAISO would need to pursue transmission alternatives to maintain reliability.

In its 2025-2026 TPP, the CAISO identified transmission upgrades that would mitigate or defer the reliability concerns associated with cancellation of the Del Amo-Mesa-Serrano 500 kV transmission reinforcement project, absent sufficient storage.[10] These upgrades have a combined cost of approximately $3.3 billion.[11]

	Mitigation	Cost
1.	4th Mesa 500/230 kV transformer	$126 M
2.	Reconductor Mesa - Laguna Bell 230 kV #2 line	ISO approved project
3.	Reconductor Lighthipe-Mesa 230 kV line #1	$122 M
4.	Reconductor Center - Del Amo 230 kV line	$79 M
5.	Reconductor Mesa-Center 230 kV	$132 M
6.	New Mesa-Laguna Bell or Mesa Lighthipe 230 kV line	$ 2.8 B
	Total	**$3.3 B**

The particular combination of upgrades required would depend on future system conditions and additional analysis conducted through the TPP cycle. Nevertheless, the scale and estimated cost of these potential upgrades underscore the importance of establishing a reasonable

[10] 2025-2026 Transmission Planning Process Stakeholder Meeting Presentation, slide 59.

[11] Mitigation solutions #1-5 are identified in the 2025-2026 Transmission Planning Process Report Section B.4.4.8 available on the CAISO Market Participant Portal. Mitigation solution #6's cost estimate is currently being assessed within the 2026-2027 TPP and is the current planning estimate for the mitigation.

and supportable expectation regarding the quantity of storage that will materialize in the Western LA Basin.

2. Policy-Driven Transmission Upgrades Alternatives

Storage development in the Western LA Basin also has significant implications for deliverability and policy-driven transmission needs. With the level of battery energy storage resources assumed to be developed and in-development based on the Commission's resource portfolio, the CAISO determined that the previously approved and subsequently canceled Del Amo-Mesa-Serrano 500 kV transmission reinforcement project is no longer needed as a policy-driven transmission upgrade in the high system need cases to address the Mira Loma-Mesa transmission constraint.[12]

If substantially less battery storage develops in the area than assumed in the 2025-2026 Transmission Plan, the Mira Loma-Mesa transmission constraint becomes binding and significantly limits deliverability for most of the resource areas in the southern part of the CAISO system.[13] Absent sufficient locational resource development to address this constraint, the CAISO will need to recommend a new Serrano-Mesa 500 kV line, or a comparable transmission alternative, for CAISO Board Approval in the 2026-2027 TPP. The currently estimated cost of the Serrano-Mesa alternative is approximately $360 million, though the ultimate cost could vary.[14]

Mitigation	Cost
1. New Serrano-Mesa 500 kV line	$180-360 M

[12] 2025-2026 Transmission Plan, p.109.

[13] See section 3.5.5 of the 2025 Transmission Plan Deliverability Allocation Report, https://www.caiso.com/documents/2025-transmission-plan-deliverability-allocation-report.pdf.

[14] The cost estimate for the Serrano-Mesa 500 kV line is currently being assessed within the 2026-2027 TPP. The estimate provided is the current planning estimate for the mitigation.

C. Busbar Mapping Should Reflect a Reasonable Expectation of Resource Development in the Western LA Basin.

The Commission has consistently included substantial quantities of storage in the Western LA Basin in the resource portfolios transmitted to the CAISO for use in the TPP. The table below summarizes the baseline, in-development, and generic 4-hr and 8-hr battery resources in the Western LA Basin in recent Integrated Resource Planning (IRP) cycles. The identified resources are resources mapped to the Alamitos, Barre, Chevmain, Del Amo, El Nido, El Segundo, Ellis, Hinson, Huntington Beach, Johanna, La Cienega, Laguna Bell, Lighthipe, Mesa, Redondo, and/or Rio Hondo substations.[15]

	In-development Baseline Resources	**In-development Portfolio Resources**	**Generic Resources**	**Total**
2027-2028 TPP Portfolio	4-hr storage: **270 MW** 8-hr storage: **0 MW**	4-hr storage: **1,105 MW** 8-hr storage: **10 MW**	4-hr storage: **0 MW** 8-hr storage: **3,260 MW**	4-hr storage: **1,375 MW** 8-hr storage: **3,270 MW**
2026-2027 TPP Portfolio	4-hr storage: **407.6 MW** 8-hr storage: **0 MW**	4-hr storage: **922 MW** 8-hr storage: **10 MW**	4-hr storage: **0 MW** 8-hr storage: **3,508 MW**	4-hr storage: **1,247.6 MW** 8-hr storage: **3,518 MW**
2025-2026 TPP Portfolio	4-hr storage: **101.1 MW** 8-hr storage: **0 MW**	4-hr storage: **1,156.5 MW** 8-hr storage: **10 MW**	4-hr storage: **0 MW** 8-hr storage: **0 MW**	4-hr storage: **1,257.6 MW** 8-hr storage: **10 MW**
2022-2023 TPP Portfolio	4-hr storage: **51 MW** 8-hr storage: **0 MW**		4-hr storage: **709 MW** 8-hr storage: **0 MW**	4-hr storage: **760 MW** 8-hr storage: **0 MW**

[15] Initial Mapping for the 27-28 TPP Case Dashboard; Final Dashboard for the 26-27 TPP Base Case; Final Dashboard for the 25-26 TPP Base Case; Final Dashboard for the 22-23 TPP Base Case.

The consistent inclusion of Western LA Basin storage in Commission portfolios is significant because those portfolios directly inform the assumptions and solutions the CAISO evaluates through the TPP, consistent with the 2022 Memorandum of Understanding (MOU) among the Commission, the California Energy Commission, and the CAISO.[16] For example, in the 2025-2026 TPP, the CAISO relied on the Commission's portfolio when evaluating whether storage could serve as a non-wires alternative to address reliability and deliverability constraints in the Western LA Basin.

The Commission's consideration of geographically targeted procurement and its busbar mapping assumptions should reflect a consistent expectation regarding the quantity of storage that can be reasonably expected to develop in the Western LA Basin. As discussed above, the 2,405 MW and 12,075 MWh identified through the CAISO's analysis do not necessarily translate directly into an equivalent amount of new procurement. The Commission may reasonably determine that some portion of the identified need will be satisfied by resources sufficiently certain to develop without additional procurement direction.

However, if the Commission determines that additional procurement is not warranted because storage development at the scale identified by the CAISO is not feasible, economic, or otherwise appropriate in the Western LA Basin, the Commission should reflect that determination in future TPP portfolios and busbar mapping assumptions. Continuing to map substantial quantities of incremental storage to the Western LA Basin would otherwise guide the CAISO to plan the transmission system based on resource development that does not have a reasonable and supportable basis for materializing.

Where mapped resources allow the CAISO to avoid or defer transmission infrastructure, the resource assumptions transmitted to the CAISO should reflect a reasonable and supportable expectation of actual resource development.

III. Conclusion

The CAISO appreciates the opportunity to provide comments on the Ruling. The CAISO's analysis identifies a need for 2,405 MW and 12,075 MWh of additional storage in the

[16] Memorandum of Understanding Between the California Public Utilities Commission and the California Energy Commission and the California Independent System Operator Regarding Transmission and Resource Planning and Implementation at https://www.energy.ca.gov/sites/default/files/2023-01/MOU_Dec_2022_CPUC_CEC_ISO_signed_ada.pdf.

Western LA Basin to mitigate identified reliability needs and deliverability concerns. These quantities do not necessarily represent the amount of new procurement the Commission should order. The Commission should determine what portion of this need will be met by resources sufficiently certain to materialize without additional procurement direction, and the Commission should authorize geographically targeted procurement sufficient to address any remaining shortfall. Finally, the Commission should reflect that determination consistently in the resource portfolios and busbar mapping assumptions transmitted to the CAISO.

Respectfully submitted,

By: *<u>/s/ Marissa Mercado</u>*
Roger E. Collanton
General Counsel
William H. Weaver
Assistant General Counsel
Marissa Mercado
Counsel
California Independent System
Operator Corporation
250 Outcropping Way
Folsom, CA 95630
Tel: 916-963-0521
Fax: 916-608-7222
Email: mmercado@caiso.com

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