BEFORE THE PUBLIC UTILITIES COMMISSION OF THE STATE OF CALIFORNIA

Order Instituting Rulemaking to Develop an Electricity Integrated Resource Planning Framework and to Coordinate and Refine Long-Term Procurement Planning Requirements.	Rulemaking 16-02-007 (Filed February 11, 2016)

REPLY COMMENTS OF THE CALIFORNIA INDEPENDENT SYSTEM OPERATOR CORPORATION

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The California Independent System Operator Corporation (CAISO) hereby provides reply comments in response to the *Administrative Law Judge's Ruling Seeking Comment on Proposed Reference System Portfolio and Related Policy Actions* (Ruling), filed on November 6, 2019.

I. Introduction

As the CAISO stated in opening comments, the Commission should not transmit the 46 MMT Alternate Scenario to the CAISO for use in the transmission planning process as the reliability or public policy base case. The CAISO's opening comments identified three main flaws with the 46 MMT Alternate Scenario: (1) the inclusion of generic effective capacity to make the scenario reliable; (2) the unwarranted instability in the renewable portfolio mapping; and (3) the lack of mapping for the significant storage buildout. Using the 46 MMT Alternate Scenario, or any scenario with similar flaws, would undermine the credibility of the transmission planning process and cast doubt on the whether the Integrated Resource Planning (IRP) process outputs are useful for transmission planning purposes.

Even if the Commission adopts the 46 MMT Alternative Scenario as its Reference System Plan, it should not transmit the associated portfolio for transmission planning purposes. Instead, the Commission should transmit the 2018-2019 Preferred System Plan as the reliability and public-policy base case. The Commission previously acknowledged that it can adopt one portfolio as the Reference System Plan and transmit a different portfolio for CAISO transmission

planning purposes.[1] If necessary, the Commission should adopt a similar approach for the 2020-2021 transmission planning process portfolio. Separately, the CAISO can assess the 46 MMT Alternate Scenario as a sensitivity to inform future Commission decision making.

II. Discussion

In response to opening comments, the CAISO's recommends that the Commission: (1) set consistent modeling import constraints based on historical resource adequacy contracting, (2) improve storage resource modeling, (3) consider alternative capacity expansion and production cost modeling platforms, (4) correct RESOLVE renewable energy resource zones, and (5) continue to use the CAISO's existing deliverability methodology. The CAISO also provides additional comments regarding future improvements for allocation of the maximum import capability.

A. The Commission Should Set Consistent Modeling Import Constraints Based on Historical Resource Adequacy Import Contracting.

The CAISO agrees with Southern California Edison's (SCE's) recommendation to set modeling import constraints in RESOLVE and SERVM at 6,937 MW to account for historical resource adequacy contracting.[2] This figure represents historical short-term import contracts plus additional dedicated import capability from Palo Verde, Hoover and the Intermountain Power Plant (IPP).[3] In contrast to SCE's recommendation, several other parties argue that the Commission should model a higher import constraint, even up to the maximum import capability. However, these parties do not offer any information regarding whether resources in the rest of the West would be available and willing to provide energy under stressed conditions *in the future*.[4] For example, the Union of Concerned Scientists (UCS) argues that "the SERVM

[1] California Public Utilities Commission, *Decision Setting Requirements for Load Serving Entities Filing Integrated Resource Plans*, February 13, 2018, p. 104-105. (D.18-02-018)
[2] California Public Utilities Commission, *Administrative Law Judge's Ruling Seeking Comment on Proposed Reference System Portfolio and Related Policy Actions*, November 6, 2019, R.16-02-007, Attachment C, p. 93.
[3] Southern California Edison Company *Opening Comments on Administrative Law Judge's Ruling Seeking Comment on Proposed Reference System Portfolio*, December 17, 2019, pp 23-26. (SCE Opening Comments).
[4] *See, e.g.*, California Community Choice Association *Comments on Ruling Seeking Comment on Proposed Reference System Portfolio*, December 17, 2019, pp. 17-21. (CalCCA Opening Comments); Pacific Gas & Electric Company *Opening Comments to Ruling Seeking Comment on Proposed Reference System Portfolio*, December 17, 2019, p. 8. (PG&E Opening Comments); San Diego Gas and Electric Company *Comments in Response to Ruling Seeking Comment on Proposed Reference System Portfolio*, December 17, 2019, p. 15. (SDG&E Opening Comments); Union of Concerned Scientists *Opening Comments on Ruling Seeking Comment on Proposed Reference System Portfolios*, December 17, 2019, p. 9. (UCS Opening Comments)

probabilistic reliability modeling is already designed to capture if/when CAISO reliability shortfalls can be alleviated by capacity surpluses in the rest of the WECC"[5] and that reliance on emergency transfers with neighboring balancing authorities[6] can reduce the cost of procuring "unnecessary capacity."[7] However, there is no evidence that the Energy Division's SERVM modeling provides the level of analysis the UCS seeks. The Commission should not conduct reliability planning that assumes that requests for emergency assistance will guarantee delivery of energy. Further, the CAISO notes that any reduced capacity costs associated with this approach may subsequently cause increased energy costs, especially if the CAISO balancing authority area requires additional energy under system stressed conditions (*i.e.*, high loads, emergencies, wide-spread maintenance events, etc.). Lastly, UCS's proposal runs counter to the Commission's desire for more specificity from import resources that provide reliability services.[8] In contrast, using the 6,937 MW import limit is prudent because it strikes the appropriate balance between past experience and potential future declines in resource availability. As a result, the 6,937 MW import limit is appropriate to use for near- and long-term planning.

In order to better understand the going forward expectations for import contracting, the CAISO agrees with CalCCA's recommendation for the Commission to have "greater coordination with planning and regulatory bodies throughout [the] WECC to develop a more analytically robust import constraint, which considers both the shifting supply and demand throughout the planning horizon [to] ensure a more accurate modeling of potential imports to California."[9] As a starting point, the Commission should consider Energy+Environmental Economics's (E3) recently published report on the status of resource adequacy in the Pacific Northwest. That report finds that the Pacific Northwest region "is expected to need new capacity in the near term in order to maintain an acceptable level of Resource Adequacy after planned coal retirements" and "[b]ecause the region lacks a formal mechanism for ensuring adequate

[5] UCS Opening Comments, p. 9.
[6] *Id*., p. 8.
[7] *Id.*, p. 6.
[8] California Public Utilities Commission, *Decision Requiring Electric System Reliability Procurement for 2021-2023*, November 7, 2019, p. 16. (D.19-11-016) "We will address the particulars about import counting later in this decision, but for purposes of whether or not to pursue near-term reliability procurement, this decision reflects the Commission's heightened concern about the reliance on imports without firm contractual obligations to meet peak demand reliability needs."
[9] CalCCA Opening Comments, p. 21.

physical firm capacity, there is a risk that reliance on market transactions may result in double-counting of available surplus generation capacity."[10]

With regard to meeting resource adequacy requirements, it is critical for RESOLVE and SERVM to use the same import constraints, as SCE and San Diego Gas and Electric (SDG&E) noted.[11] The CAISO supports using the 6,937 MW import constraint for both energy and capacity in both RESOLVE and SERVM. The models must be consistent because RESOLVE is used to develop the portfolio that will meet the 1-in-2 load plus 15 percent planning reserve margin resource adequacy requirement, while SERVM is used to validate that the portfolio is operable and reliable. If the SERVM model allows for more import energy than RESOLVE, the imported energy may mask a potentially unreliable portfolio and undermine the usefulness of a production cost model validation.

B. The Commission Should Improve Storage Resource Modeling.

Recent capacity expansion modeling increasingly selects storage resources in the Energy Division's study scenarios, especially when those scenarios consider more aggressive carbon reduction targets. To ensure that the selected portfolios meet reliability and environmental requirements, the Commission should improve storage resource modeling. Specifically, the CAISO agrees that the Commission should adopt improvements to its storage resource modeling to:

1. Identify the appropriate locations for all types of storage resources so that they can be appropriately modeled in the CAISO's transmission planning process, as recommended by Bay Area Municipal Transmission group (BAMx) and CalCCA.[12] At this point, there is insufficient analysis and subsequent policy guidance around storage that would allow the Commission to reasonably direct where transmission should be considered in order to facilitate storage interconnection. The Commission should conduct this important work before transmitting a reliability or policy base case to the CAISO's transmission planning

[10] Energy+Environmental Economics (E3), *Resource Adequacy in the Pacific Northwest*, Executive Summary, pp. iii-iv. https://www.ethree.com/wp-content/uploads/2019/03/E3_Resource_Adequacy_in_the_Pacific-Northwest_March_2019.pdf.
[11] SCE Opening Comments, p. 26; SDG&E, Opening Comments, p. 16.
[12] Bay Area Municipal Transmission Group, *Comments in Response to Ruling Seeking Comment on Proposed Reference System Portfolio*, December 17, 2019, p. 6. (BAMx Opening Comments); CalCCA Opening Comments, p. 38.

process. In the meantime, the CAISO is open to working with the Commission and Energy Division staff to inform such an analysis through sensitivity studies in the transmission plan.

2. Include storage cycling costs to ensure a more accurate unit dispatch, especially in the production cost modeling assessment, as recommended by Calpine;[13]
3. Conduct a more granular assessment of the effective load carrying capability (ELCC) for storage resources with different durations, operational characteristics, and penetrations, rather than modeling a static four-hour lithium-ion battery, as recommended by Calpine and the California Energy Storage Alliance (CESA);[14]
4. Incorporate more realistic operational limitations for storage resources in both the capacity expansion and production cost modeling. As Calpine, CESA, and SDG&E note, hybrid resources taking advantage of the investment tax credit may have operating restrictions that stand-alone batteries do not have, which should be captured in the modeling.[15] Similarly, PG&E correctly notes that it is not realistic to assume that behind-the-meter (BTM) energy storage is fully dispatchable because BTM resources behave differently from in-front-the-meter (FTM) energy storage. For example, PG&E notes that BTM storage "may not operate daily, may sit idle for reliability purposes, may be dispatched to reduce demand charges, and may not be dispatched like FTM storage for ancillary services, etc."[16] Although the BTM storage resources account for only a small portion of capacity today, the Commission's modeling should consider such operational restrictions, or, at the very least, consider BTM storage as a separate resource from FTM storage. The CAISO also agrees with CESA that a weakness in RESOLVE is that it "systematically understate[s] the capacity needs of the system since it does not take into account sequences of continuous challenging days (*e.g.*, a cloudy week or a multi-day extreme weather event)."[17] This means that as battery durations increase, RESOLVE may not be able to determine whether there is sufficient charging capability to ensure that

[13] Calpine Corporation, *Comments on Ruling Seeking Comment on Proposed Reference System Portfolio*, December 17, 2019, p. 4. (Calpine Opening Comments)
[14] Calpine Opening Comments, p. 2; California Energy Storage Alliance, *Comments on Ruling Seeking Comment on Proposed Reference System Portfolio*, December 17, 2019, pp. 6-7. (CESA Opening Comments)
[15] Calpine Opening Comments, p. 2; CESA Opening Comments, p. 4; SDG&E, Opening Comments, p 23.
[16] PG&E Opening Comments, p. 6.
[17] CESA Opening Comments, p. 3.

storage resources are available to discharge when necessary.

C. The Commission Should Consider Alternative Capacity Expansion and Production Cost Models.

The CAISO believes SCE provides several illuminating comparisons between the RESOLVE modeling results and its own ABB capacity expansion modeling results using the same or similar inputs and assumptions.[18] The CAISO encourages the Commission to investigate this issue further to better understand whether certain modeling results are a consequence of RESOLVE's modeling limitations or whether the results can be validated through other models.

For production cost modeling, CalCCA notes that SERVM fails to capture unit commitment constraints, unlike other production cost models.[19] The CAISO believes this is because SERVM does not use mixed integer linear programming and may not account for some ramping needs, leading to an overly optimistic assessment of the portfolio's operability and reliability. The CAISO encourages the Commission to investigate this issue further to better understand the impact of SERVM's modeling limitations compared to other models with improved unit commitment constraints.

The CAISO also strongly supports SCE's iterative approach to validating its capacity expansion results with production cost modeling and back again, including increasing the planning reserve margin in the capacity expansion model.[20] Using this iterative approach avoids the need to insert generic effective capacity into the capacity expansion portfolios to meet reliability needs.

D. The Commission Should Correct RESOLVE Renewables Modeling Zones.

In Opening Comments at least one party expressed concerns regarding the RESOLVE modeling for renewable energy resource zones outside of California.[21] In reviewing the zones, CAISO also identified a correction the Commission should make to include western Arizona renewables as CAISO-connected resources that are not subject to additional transmission costs. The current RESOLVE modeling is incorrect and therefore inappropriately excludes economic

[18] SCE Opening Comments, pp. 19-23.
[19] CalCCA Opening Comments, p. 9.
[20] SCE Opening Comments, pp. 33-34.
[21] GridLiance West, LLC, *Comments on Revised Proposed Decision on Proposed System Reference Plan Portfolio*, December 17, 2019, p. 3.

western Arizona resources.

E. The Commission Should Not Use the CAISO's Proposed New Deliverability Methodology to Modify its Renewable Portfolios.

Several parties recommend adjusting renewable resource portfolios based on transmission capability estimates reflecting the CAISO's proposed revised deliverability methodology.[22] The CAISO disagrees and recommends that the Commission continue to develop renewable portfolios based on the current deliverability methodology while the CAISO assesses the impact of proposed new methodology through its transmission and generation interconnection processes.

As background, the CAISO Board of Governors recently approved modifications to the CAISO's deliverability methodology to incorporate changing grid conditions and align with Commission changes to the effective load carrying capability (ELCC) values for wind and solar qualifying capacity. However, the Federal Energy Regulatory Commission (FERC) must still approve the changes to the proposed deliverability methodology before it becomes effective. Because FERC has not yet approved the proposed methodology and the CAISO has not produced results using the proposed methodology, the Commission should use the existing deliverability methodology to develop its renewable portfolios.

In the meantime, the CAISO will assess the impact of the methodology change through the course of the 2020-2021 transmission planning cycle as well as through the Cluster 12 Phase 2 and Cluster 13 Phase 1 generation interconnection studies. The results of these studies will provide input into the next IRP cycle. In addition, the CAISO will assess the impact of the large number of modification requests received from generators seeking to add storage to existing or in-queue generation projects, presumably to shore up declining qualifying capacity values for their solar projects as the Commission transitions to an ELCC-based qualifying capacity. These modifications to existing or in-queue projects will have a significant impact on the deliverability available to new generation resources. The Commission should wait until the CAISO and stakeholders better understand the implications of the proposed deliverability methodology before it adopts modified renewable resource portfolios in the IRP process.

[22] CALCCA Opening Comments, p. 37; BAMx Opening Comments, p. 5.

F. The CAISO Is Developing a Multi-Year Maximum Import Capability Allocation to Better Support Multi-Year Incremental Procurement Under IRP.

As Powerex notes, the CAISO currently allocates the import capability to load serving entities on a yearly basis.[23] To better support longer term contracting, the CAISO has launched an initiative to consider a multi-year allocation process.[24] This improvement will support the multi-year near-term incremental procurement authorized under the IRP procurement track as well as support a multi-year system resource adequacy, if the Commission adopts multi-year in the future.

III. Conclusion

The CAISO appreciates the opportunity to comment on the proposed Reference System Plan and the Commission's IRP process.

Respectfully submitted,

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[23] Powerex Corp., *Comments on Ruling Seeking Comment on Proposed Reference System Portfolio*, December 11, 2019, p. 6.
[24] See: http://www.caiso.com/StakeholderProcesses/Maximum-import-capability-stabilization-multi-year-allocation.