Comments of Powerex Corp. on Price Performance in CAISO's Energy Markets Final Report

Submitted by	Company	Date Submitted
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Powerex appreciates the opportunity to submit comments on CAISO's September 23, 2019 report entitled "Price Performance in the CAISO's Energy Markets," and the associated stakeholder discussion on September 27, 2019 (collectively, the "Report").

Powerex believes the Report has provided extensive and valuable insight into the factors affecting price outcomes in CAISO's markets. This information greatly aids market participants and stakeholders in understanding the key drivers of market prices and thus strengthens both the transparency of, and confidence in, those markets.

Powerex especially appreciates the Report's candor in recognizing where the current market design may have critical gaps, leaving CAISO operators with little choice but to manually intervene in the market to ensure reliable operations. The Report not only identifies and quantifies many of those types of operator actions, but employs objective analyses to explore the impact of those actions on market prices. Moreover, the Report identifies the fundamental cause of many of these "gaps," such as the fact that the optimization of the Flexible Ramping Product does not ensure that such stand-by flexible capacity can actually deliver energy to where it is needed.[1]

A recurring general theme in the Report is that—under specific but not infrequent conditions—the quantity and characteristics of the supply dispatched through the CAISO markets is not able to meet the needs of the CAISO BAA. The Report provides insight into three potential root causes of such outcomes:

1. Supply offers in the CAISO markets are insufficient to meet all of the products and services that are needed;[2]
2. Supply offers may not perform when dispatched, or may otherwise not meaningfully be available to meet the needs of the grid;[3] and/or

[1] Report, at 79-80.

[2] Report, at 46-47 and Fig. 37. *See also* CAISO July 15, 2019 presentation *System-Level Market Power*, at 7 (finding that "our highest prices occur when supply reserves are extremely low"). *Available at:* http://www.caiso.com/Documents/Presentation-SystemLevelMarketPowerWorkingGroup-Jul15-2019.pdf

[3] Report, at 104-108.

3. The market design leads to an inefficient or infeasible set of schedules or dispatches.[4]

Drawing upon its analyses and findings, the Report contains important recommendations that focus on better ensuring market solutions are feasible. These recommendations include enhancements to ensure the real-time Flexible Ramping Product is deliverable[5] and support for the Day Ahead Market Enhancements proposal to co-optimize the procurement of energy, capacity, and balancing reserves on a day-ahead basis.[6]

Powerex believes the analyses contained in the Report provide compelling evidence of the need for these improvements. While the Report is offered as a final report on price performance—and Powerex recognizes that this initiative cannot remain open indefinitely—Powerex believes that a limited amount of additional analysis can be of similar benefit to two of CAISO's other high-priority initiatives: Resource Adequacy Enhancements and the Extended Day-Ahead Market stakeholder processes. Powerex respectfully recommends the limited additional analyses described below in support of those two initiatives.

Does The System Resource Adequacy Requirement Accurately Cover Actual CAISO Peak Needs Each Month?

CAISO is currently exploring enhancements to the Resource Adequacy program, including examining supply-side eligibility and counting rules. As part of the Resource Adequacy Enhancements initiative, CAISO recently published an analysis comparing the actual resource capacity available in the CAISO markets against the 1-in-2 peak load forecast (plus contingency reserves) that underlie the Resource Adequacy Requirement.[7] Powerex believes a related and critical question is whether the Resource Adequacy Requirement accurately captures the *actual* capacity needs experienced by the CAISO. In other words, even if enhancements were 100% successful in ensuring that the CAISO had access to capacity equal to the full quantity of Resource Adequacy Requirements, would this be enough to meet CAISO's peak capacity needs (*i.e.,* to meet peak load plus required contingency reserves plus CAISO regulation reserve) with a high degree of confidence?

The specific analysis of interest would therefore be to compare:

- The monthly peak real-time demand in the CAISO markets, equal to:
    - The maximum 5-minute RTD load forecast in any hour (including any manual load adjustments); *plus*
    - operating reserves; *plus*
    - upward regulation reserves

[4] Report, at 79-80.

[5] Report, at 17-18.

[6] Report, at 18.

[7] CAISO October 9, 2019 presentation, *Resource Adequacy Enhancements: Second Revised Straw Proposal Stakeholder Meeting*, at 17. (Powerex believes the vertical axis label was intended to read "Available RA minus RA Requirement (MW)") *Available at:* http://www.caiso.com/Documents/Presentation-ResourceAdequacyEnhancements-SecondRevisedStrawProposal.pdf

- The total Resource Adequacy Requirement, as established by the California Public Utilities Commission, for the respective month

The above analysis would yield a simple comparison for each month, from January 2017 to the present, of the minimum quantity of resources required to be secured in advance by the RA program against the actual operational need for physical resources under peak real-time conditions. This straightforward analysis would provide critical insight regarding the extent to which the current Resource Adequacy Requirement is sufficient to enable the CAISO to maintain reliability in the CAISO BAA, *under perfect supply conditions where all RA supply is fully available and deliverable*. For example, if multiple months indicate that the Resource Adequacy Requirement was less than the peak CAISO BAA demand plus operating reserves and regulation, then a key reliability gap will persist even if each and every MW of contracted Resource Adequacy capacity consisted of real and deliverable physical supply that was fully available and capable of performing when dispatched. Alternatively, if all months show that the current determination of Resource Adequacy Requirement is equal to or greater than the peak CAISO BAA demand plus operating reserves and regulation, then there can be confidence that the demand side of the Resource Adequacy framework may not require modification at this time, and more effective enhancements likely on the supply side, such as ensuring all contracted Resource Adequacy supply represents real physical resources that can be delivered to the CAISO BAA, and adjusting supply quantities for expected forced outage rates.

Quantifying Non-Performing Supply Offers or Resource Adequacy Commitments

The amount of supply is, generally speaking, an indication of the anticipated ability of the CAISO market to meet the needs of the CAISO BAA under a range of potential conditions. This applies both in the planning timeframe—in which Resource Adequacy commitments indicate the ability to meet the peak demand of the CAISO BAA—as well as throughout the operational timeframe—in which the energy offers received each hour indicate the ability of the CAISO market optimization to reach a feasible solution.

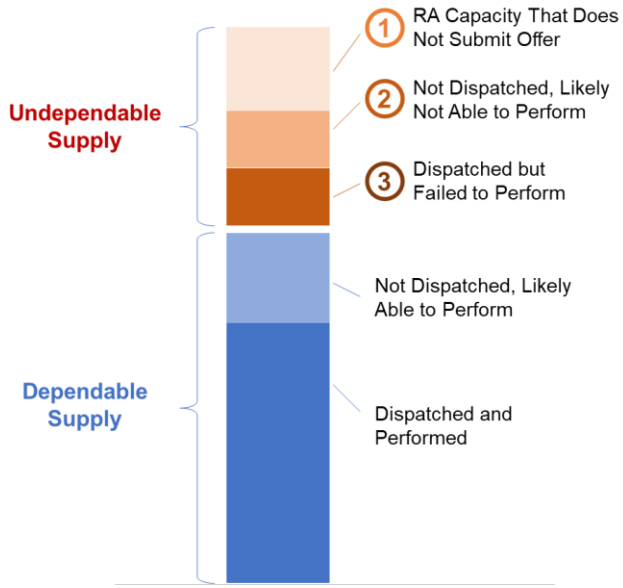
To the extent that expected supply either does not materialize or does not perform, then the expected supply will be over-stated. This has numerous adverse consequences for reliability and efficiency:

- **Reliability:** when supply that is expected does not materialize, reliability may be jeopardized if alternative supply is not available;
- **Equity:** supply that does not materialize or perform may earn revenues funded by California ratepayers but without contributing to serving load;
- **Inefficient procurement or dispatch:** in the procurement of supply, non-performing resources may "crowd out" commitments or awards to resources that are able and willing to perform;
- **Inefficient price outcomes:** non-performing supply distort prices through participating in the market-clearing process, and may further distort prices if CAISO operators need to take out-of-market actions or other manual interventions to replace non-performing supply; and

- **Undermine EIM resource sufficiency test:** including non-performing supply in the EIM resource sufficient test can undermine the ability of the test to prevent "leaning."

An analysis to gauge the range of potentially over-stated supply can inform two critical aspects of CAISO's current enhancement initiatives. First, quantifying the range of Resource Adequacy supply that does not materialize or under-performs can help identify and address gaps in the Resource Adequacy program. Second, having confidence that Resource Adequacy commitments will materialize and will be able and willing to perform is critical to enabling the CAISO BAA to include this supply in a future day-ahead resource sufficiency test as part of an EDAM.

Powerex believes valuable insight into the extent of CAISO supply offers that may not represent real physical capacity and/or may not perform can be derived from analyzing the top 150 CAISO load hours of 2018. Conceptually, supply may be either "dependable" or "undependable," as depicted below:



Powerex suggests that CAISO evaluate, during the hours of highest system need (*e.g.,* the top 150 hours of 2018), the range (minimum, maximum, and mean) of each of the above categories in order to inform each of the questions below:

- What was the aggregate quantity of internal generation capacity under Resource Adequacy contracts that failed to submit an offer into the CAISO market? *(Category 1 in the figure above)*
    - How much was due to a planned outage?
    - How much was due to a forced outage?
    - How much has no identified reason?
- What was the aggregate quantity of internal generation capacity that was offered and was not dispatched, but was offered at a price of $500/MWh or higher? $750/MWh or higher? *(Category 2)*

- What was the aggregate quantity of internal generation capacity that under-performed relative to dispatch? *(Category 3)*
    - How do these results vary by type of resource (*e.g.,* hydro, fossil-fueled, demand response … etc.)?
- What was the aggregate quantity of external capacity under Resource Adequacy contracts that failed to submit an energy offer into the CAISO market? *(Category 1)*
- What was the aggregate quantity of import offers that did not clear the market, and was offered at a price of $500/MWh or higher? $750/MWh of higher? *(Category 2)*
- What was the aggregate quantity of import offers that under-performed relative to the CAISO dispatch? *(Category 3)*

Powerex emphasizes that this analysis is not intended to reach definitive conclusions about specific market participants or resources. Rather, the analysis is intended to provide a broad but valuable estimate of the range of supply that may ultimately not materialize or fully perform, given current practices and market rules. Powerex believes this insight will help the development of a more robust Resource Adequacy framework as well as enable the CAISO BAA to participate in a regional market that requires participants to be resource sufficient.