Comments of Powerex Corp. on Imbalance Conformance Enhancements
Revised Draft Final Proposal

Submitted by	Company	Date Submitted
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I. Introduction

Powerex appreciates the opportunity to submit comments on CAISO's March 14, 2018 Revised Draft Final Proposal on Imbalance Conformance Enhancements ("Revised Draft Proposal"). CAISO explains that the Revised Draft Proposal contains a number of changes from the previous proposal in this proceeding. Among other things, CAISO explains that it is now proposing to clarify the authority of both CAISO and entities participating in the Energy Imbalance Market ("EIM") to make manual adjustments to load forecasts (*i.e*., to engage in load biasing or, as also called by the CAISO, *imbalance conformance*). CAISO further explains that it has modified its proposal regarding the elimination of the load bias limiter (also called the *imbalance conformance limiter*), which prevents a load adjustment from exceeding the capacity available in the market and triggering the application of shortage pricing. While CAISO's prior proposal contemplated that use of the load bias limiter would sunset after approximately two years, the Revised Draft Proposal now states that it will only eliminate use of the limiter if additional analysis demonstrates that "removal of the limiter will not have any adverse impacts to the market or market pricing."

As discussed further below, while Powerex supports CAISO's decision to seek authority under its tariff to engage in load biasing, Powerex believes that CAISO should:

- Convene a separate stakeholder proceeding to further evaluate the factors contributing to the frequent and persistent use of upward load biasing in the CAISO balancing authority area ("BAA") and identify solutions to minimize reliance on this practice; and
- Immediately eliminate use of the load bias limiter or, at the very least, include in its tariff amendments a sunset date for the load bias limiter of no later than Fall 2020.

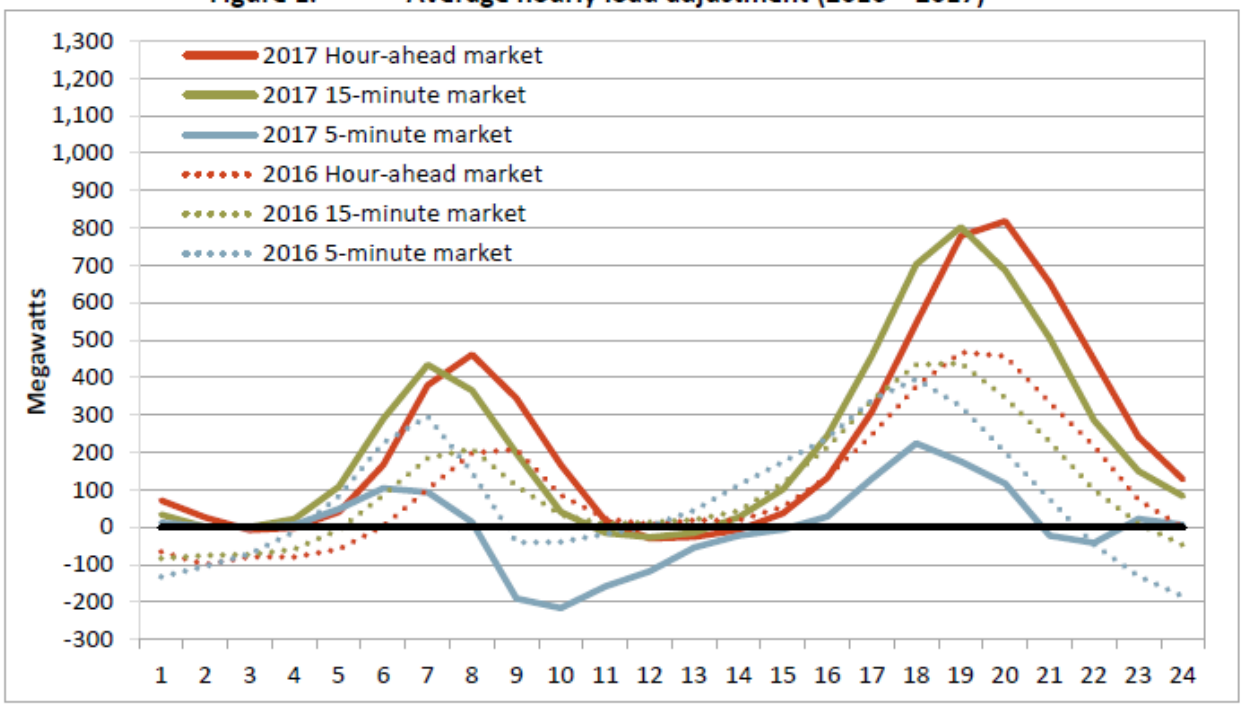
II. CAISO Should Convene A Separate Stakeholder Proceeding To Further Explore The Factors Driving The Use Of Load Biasing

Powerex supports CAISO's decision to revise its tariff to clarify the authority of CAISO and EIM entities to engage in load biasing. Powerex agrees that grid operators should have the ability to make manual adjustments to the load forecast used in the market solution in order to more accurately reflect the estimated need for imbalance energy on the grid. Moreover, Powerex agrees with CAISO that the authority to engage in load biasing should be set out in the CAISO tariff. Powerex notes, however, that it is important that such tariff revisions make it clear that the practice is to be used to correct inaccuracies or gaps (*i.e.,* to address issues including random errors in automated load forecasts and uninstructed deviations in generation), rather than for the purpose of managing price.

Notwithstanding Powerex's support for load biasing in narrow, well-defined, circumstances, Powerex remains concerned that the frequent and persistent use of upward load biasing in the CAISO BAA is masking systemic and material underlying market design and/or operational issues. If load biasing were being used solely for the purpose of correcting for inaccuracies or gaps in the automated inputs into CAISO market solutions, it should be expected that the use of load biasing would be infrequent, limited in magnitude, and, most importantly, unpredictable in direction. In practice, however, CAISO operators frequently make significant upward adjustments to load in both the hourly and 15-minute markets, particularly during the morning and evening hours when the need for energy and upward ramping capability in the CAISO BAA is greatest. This pattern of persistent and frequent upward load biasing in the CAISO BAA is depicted in Figure 1 below, which is taken from the CAISO Department of Market Monitoring's ("DMM") February 20, 2018 comments in this proceeding.[1] This figure shows that the use of load biasing falls into a consistent and persistent pattern, with CAISO operators making significant upward adjustments to load in the hour-ahead and 15-minute markets in excess of 800 MW *on average* during the evening peak and approximately 450 MW *on average* during the morning ramp in 2017. The figure also shows that the use of load biasing in the 5-minute markets exhibits strong and persistent patterns across the day.

[1] DMM Comments on Imbalance Conformance Enhancement Draft Final Proposal at 2, *available at:* http://www.caiso.com/Documents/DMMComments-ImbalanceConformanceEnhancements-DraftFinalProposal.pdf. This figure is similar to the DMM chart reproduced in the Draft Final Proposal, except that it is based on data for all of 2016 and 2017, rather than just for the third quarter.

Figure 1. Average hourly load adjustment (2016 – 2017)



The predictable pattern of load biasing suggests that CAISO operators are not using load biasing to correct for random and unpredictable errors in both the upward and downward directions, but rather to compensate for existing market processes that regularly underestimate the amount of energy and/or upward ramping required to maintain system reliability. Because CAISO's load forecast is a critical input into the CAISO markets and affects a wide range of CAISO market processes, the use of load biasing and the underlying issues are likely having significant and far reaching effects on numerous aspects of the CAISO markets, including price formation, EIM resource sufficiency, and the procurement and compensation for flexible ramping capability. It remains unclear, for instance, whether the EIM resource sufficiency tests for the CAISO BAA are based on the load forecast prior to any operator adjustments. If they are, then these tests may understate the quantity of energy, capacity and/or flexible ramping capacity required to ensure that the CAISO BAA does not need to "lean" on EIM Transfers to maintain reliability. As explained below, the inequities associated with the failure of the EIM resource sufficiency tests to effectively protect against leaning likely would be compounded by the load bias limiter, which could have the effect of artificially reducing prices paid for EIM Transfers.

Powerex continues to believe that CAISO should convene a separate stakeholder initiative to identify the root causes driving the persistent and frequent use of load biasing by the CAISO operators and to identify market design and system changes that can reduce the need to rely on this practice. Ultimately, Powerex believes that the goal

of such an effort should be to reduce CAISO's use of load biasing such that CAISO's expected load bias for any given operating interval is 0 MW.[2] While these efforts are underway, Powerex further recommends that CAISO examine, and report on, the impact of load biasing on the application of the EIM resource sufficiency framework, and make recommended enhancements to prevent "leaning."

III. The Load Bias Limiter Should Be Eliminated Immediately Or At A Predefined Date

In the Revised Draft Proposal, CAISO modifies its proposal to eliminate use of the load bias limiter within approximately 2 years. In the prior version of its proposal, CAISO proposed to eliminate the load bias limiter after implementation of enhancements designed to increase the accuracy of load adjustments, with a target sunset date of Fall 2020. In the Revised Draft Proposal, however, CAISO appears to hedge its commitment to the elimination of the load bias limiter, stating that it will conduct additional analysis after implementation of its proposed enhancements and only eliminate the load bias limiter if that analysis demonstrates that "removal of the limiter will not have any adverse impacts to the market or market pricing."[3]

Powerex continues to believe that the use of the load bias limiter is unwarranted and should be eliminated immediately. As Powerex has explained, the sole function of the load bias limiter is to interfere with the application of shortage pricing during intervals where there is a shortage of energy or ancillary services in the scheduling run of the market optimization. By its very design, the load bias limiter will prevent an operator's manual load adjustment from triggering shortage pricing, even where the adjusted forecast more accurately reflects grid conditions and exposes a genuine supply shortage in the market.[4] In short, the application of the load bias limiter is not grounded on an objective assessment of whether or not a load adjustment resulted in a load forecast that more accurately reflects system needs and only serves to reduce the frequency with which the CAISO market software applies shortage pricing.

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[2] In comments on the Draft Final Proposal, DMM articulated a similar goal. *Id.* ("Further, hour-ahead and 15-minute market load adjustments regularly follow a predictable daily pattern that mirrors the shape of hourly net load, with larger and more frequent positive load adjustments during the morning and evening peak net load periods. DMM emphasizes that improvements should be made to minimize known conformance needs and prevent conformance to a predictable pattern. To the extent that large predictable load adjustments during peak net load hours persist after improvements to the conformance process are made (e.g. as an avenue used by operators to procure additional generation overall or from market participants in the hour-ahead and 15-minute market in particular), the root cause for that need should be addressed to reduce the practice of manual load adjustments.").

[3] Revised Draft Proposal at 23.

[4] Moreover, the design of the load bias limiter is not symmetric. That is, while the load bias limiter blocks operator adjustments from *triggering* penalty prices, it does not prevent operator adjustments from *eliminating* a supply shortage. The result is the one-way suppression of shortage prices.

In the Revised Draft Proposal, CAISO states that retention of the load bias limiter is necessary to prevent adverse market impacts because "coarse and over-estimated" operator adjustments often result in "artificial market infeasibility." Notably, however, there is not any evidence that operator adjustments systematically overestimate system needs or that the load bias limiter operates to prevent load adjustments from creating "artificial market infeasibility." Moreover, the fact that CAISO operators regularly make significant upward adjustments to load forecasts in the same hours each day actually suggests that operator adjustments reflect legitimate system needs for additional energy and/or upward ramping and may be exposing actual supply shortages in the market.

CAISO also states that minimizing the application of shortage pricing is in the best interest of all market participants. It is not. Preventing the appropriate application of shortage pricing inherently creates both winners and losers. The "winners" from preventing the application of shortage pricing are the net purchasers within the CAISO BAA, who pay a lower price and face reduced price volatility for their real-time purchases. Conversely, suppliers to the CAISO BAA—and especially suppliers of flexible capacity—are undeniably worse off when the load bias limiter prevents shortage pricing from being appropriately applied, as the price they receive does not fully reflect the economic value of their supply.

The limited data provided in the Revised Draft Proposal minimizes the effect of the load bias limiter by showing the impact on average prices in each BAA across all hours. A far more relevant analysis would be to show the number of hours that the load bias limiter would be triggered, and the price impact in each BAA specifically during those hours. In addition, the price impacts of the load bias limiter should be evaluated in relation to the EIM transfers occurring during the intervals affected by the load bias limiter. This would reveal, for each EIM entity, as well as the CAISO BAA, the dollar impact associated with (1) reduced prices during hours of net EIM exports; and (2) reduced prices during hours of net EIM imports. Such an analysis would provide a more meaningful basis for stakeholder to assess how they are impacted by continued application of the load bias limiter.

Powerex believes that such an analysis is likely to show that the load bias limiter largely benefits purchasers of real-time energy in the CAISO BAA but harms suppliers in the CAISO BAA as well as EIM entities. This reflects that the hours of the day in which the load bias limiter appears to have the greatest average impact on prices largely coincide with the hours of the day in which the CAISO BAA typically receives large EIM transfers: during the morning and evening net load peaks. This implies that the effect of the load bias limiter is to reduce real-time prices precisely during the intervals when CAISO load is being served by EIM imports, ultimately reducing the cost to California loads while also reducing the prices received by in-state suppliers and EIM entities that supply energy to California in those intervals.

For the foregoing reasons, Powerex continues to believe that CAISO should eliminate the use of the load bias limiter immediately. However, in the event that CAISO believes it is necessary to retain the load bias limiter while it moves forward with the market enhancements outlined in the Revised Draft Proposal, Powerex believes that CAISO should: (1) provide the additional analyses outlined above to permit all market participants to better evaluate the impact of the load bias limiter; and (2) reinstate its initial proposal of a sunset date for use of the load bias limiter of no later than Fall 2020 in any tariff revisions filed with the Federal Energy Regulatory Commission.