

# Memorandum

**To:** ISO Board of Governors

**From:** Eric Hildebrandt, Executive Director, Market Monitoring

**Date:** December 7, 2022

**Re:** Department of Market Monitoring report

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*This memorandum does not require ISO Board of Governors action.*

## EXECUTIVE SUMMARY

This memo provides comments by the Department of Market Monitoring (DMM) on two sets of rule changes being proposed by Management.

- **Resource Sufficiency Evaluation Enhancements Phase 2.** The proposal to exclude low priority exports scheduled out of the California ISO from test requirements for the ISO balancing area will improve how accurately the test reflects actual system requirements during periods of potential resource insufficiency. The revised energy assistance option included in the proposal is a reasonable compromise that could encourage a larger portion of WEIM balancing areas to participate in this option. With this revised approach, the total cost of the penalty is scaled much more closely with the degree to which areas may be relying on the WEIM when failing the test. While further refinements to this approach should be considered, the relative simplicity of the proposal will allow implementation of this option by summer 2023.
- **Energy Storage Enhancements.** DMM supports the proposed enhancements, which will improve the availability of ancillary services awarded to energy storage resources and will allow the ISO to issue exceptional dispatches to energy storage resources to maintain a required state of charge. DMM does not oppose the proposed enhancements intended to limit co-located batteries from being charged from the grid for tax reasons. However, DMM believes it would be far more efficient to reflect tax implications of grid charging in energy bids rather than by limiting the ability of resources to charge from the grid. Since co-located batteries that can't be charged from the grid will be less flexible and less able to provide capacity during critical hours, these resources should receive a lower resource adequacy capacity rating than storage resources that can charge from the grid. DMM continues to recommend that in a future initiative, the ISO re-evaluate bid cost recovery rules for storage resources to prevent unnecessary bid cost recovery payments or potential gaming of these rules.

This memo provides a more detailed discussion of both these proposals.

## RESOURCE SUFFICIENCY EVALUATION ENHANCEMENTS PHASE 2

### Low priority exports

Management proposes to change how the resource sufficiency evaluation treats low priority exports scheduled out of the ISO balancing area that may be cut under very tight system conditions. Currently, these low priority exports are included in the requirements that must be met by ISO balancing area capacity in both the flexibility and capacity tests. Under Management's proposal, these low priority exports will only be included in the ISO balancing area's test requirements if the export has first received an award in the ISO's day-ahead residual unit commitment process, and then proceeds to receive an hour-ahead market schedule.

This change makes the ISO balancing area's current sufficiency test requirement more reflective of actual system conditions during periods of potential resource insufficiency. The ISO has clarified that the ISO balancing area would curtail any low priority exports with hour-ahead market awards within the hour when the ISO balancing area does not have enough resources to meet its load and reserve obligations. Therefore, it seems appropriate to exclude these low priority exports from the exporting area's resource sufficiency test requirements.

However, in situations when the ISO will not curtail an export, it would be extremely inefficient to not allow other WEIM balancing areas to count export schedules out of the ISO towards meeting their resource sufficiency evaluation. In practice, the ISO expects to deliver these exports except in rare reliability emergency situations. Not allowing the receiving WEIM balancing areas to count these exports from the ISO as supply in their resource sufficiency evaluations would force the receiving WEIM balancing areas to procure other supply instead. This could result in significant inefficiencies when power from the ISO is less expensive than the alternatives.

The proposed change to the treatment of low priority exports out of the ISO is a reasonable interim compromise between, (1) placing excessive requirements on the ISO balancing area for exports it ultimately would not deliver in a reliability emergency, and (2) not allowing other WEIM areas to count the exports as capacity that the ISO would always deliver except under emergency situations.

This compromise introduces one potential source of inconsistency in that during most hours low priority exports out of the ISO will not be counted as requirements in the ISO's tests, but will be counted as supply in receiving WEIM balancing areas' tests. Thus, DMM recommends that in the next phase of this initiative, the ISO seek to develop a policy that would not allow the receiving balancing area to count these exports as supply in their tests during tight system conditions when the ISO is at high risk of not delivering the exports, such as during an emergency (EEA) event.

### Energy assistance proposal

The ISO proposes to add an energy assistance program to its existing resource sufficiency evaluation design. Each WEIM balancing area will be able to choose whether or not it elects to receive energy assistance. If an area elects to be eligible for energy assistance, the

proposal will change the consequences of that area failing a sufficiency test. Instead of limiting import transfers to the previous interval's transfer level, an area failing the test could receive the transfers needed to meet load. However, instead of paying the locational marginal price for all transfers, an area failing the test would pay an additional out-of-market energy assistance penalty cost for some of the transfers.

The penalty cost will be set at the ISO/WEIM penalty price (\$1,000 or \$2,000/MWh). The quantity of transfers into an area paying the energy assistance penalty cost would be the lesser of (1) the amount by which the area failed an upward WEIM capacity or flexibility test, or (2) dynamic WEIM transfers into the area. The ISO is not proposing to change existing sufficiency test failure consequences for balancing areas that do not elect energy assistance eligibility.

### **Analysis of revised energy assistance proposal**

In a prior ISO proposal, the energy assistance penalty cost was applied to all of a balancing area's real-time market imbalance energy when that area failed the test. DMM's analysis of this prior proposal showed that applying the energy assistance penalty to all real-time imbalance energy could significantly raise real-time market costs for balancing areas failing the sufficiency tests – even during intervals when an area did not import any additional energy through the WEIM as a result of participating in the energy assistance option.<sup>1</sup> These results suggested that participation in the energy assistance option under the prior proposal could be extremely limited.

DMM has submitted similar analysis of the potential cost and energy impacts of the revised proposal on each WEIM balancing area.<sup>2</sup> This analysis shows that the cost impacts of the Revised Final Proposal to be significantly less than the impacts of the ISO's prior proposal. More importantly, DMM believes that with this revised approach, the total cost of the penalty is scaled more closely to the degree to which areas failing the test may be relying on the WEIM to meet their load.

The revised energy assistance approach seems to be a reasonable compromise that could encourage a significant portion WEIM balancing areas to participate in this option. Assuming some WEIM areas participate in this new feature, it represents an improvement over the current market design. The relative simplicity of the proposal will allow implementation of this option by summer 2023.

However, DMM encourages the ISO and stakeholders to consider further refinements to this approach. For example, as explained by the Market Surveillance Committee (MSC), there

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<sup>1</sup> *Supplemental Comments on WEIM Resource Sufficiency Evaluation Enhancements Phase 2 – Revised Draft Final Proposal*, Department of Market Monitoring, September 27, 2022.  
<http://www.caiso.com/Documents/DMM-Comments-WEIM-Resource-Sufficiency-Evaluation-Enhancements-Phase2-Draft-Final-Proposal-Sep-27-2022.pdf>

<sup>2</sup> *Supplemental Comments on WEIM Resource Sufficiency Evaluation Enhancements Phase 2 - Revised Final Proposal*, Department of Market Monitoring December 1, 2022  
<http://www.caiso.com/Documents/DMM-Comments-WEIM-Resource-Sufficiency-Evaluation-Enhancements-Phase2-Revised-Final-Proposal-2022-12-01.pdf>

are a variety of further refinements that could better link or scale the *ex post* energy assistance penalty based on actual system conditions inside and outside of areas failing the test.<sup>3</sup> As noted by the MSC, this could encourage more balancing areas to opt into their feature on an ongoing basis.

### **Consequences of failing resource sufficiency evaluation**

DMM supports the energy assistance proposal as an improvement in the current design. However, DMM continues to recommend that the ISO and stakeholders consider further refinements to the consequences for all balancing areas that fail a sufficiency test.

For balancing areas that do not opt into the energy assistance program, the consequence of failing the test will continue to be that WEIM imports are capped at the last interval's transfer level. This may not provide a strong incentive to procure sufficient capacity to meet their forecasted load. In the next phase of this initiative, the ISO should also continue to consider refinements to the consequences for failing the test for areas that do not elect to participate in the energy assistance program.

### **Incorporating uncertainty into test requirement**

Currently, uncertainty is included in the flexible ramping test, but is not incorporated in the capacity test. The ISO is not proposing to add uncertainty back into the capacity test at this time. While incorporating some level of uncertainty into the test is reasonable, there is not an objectively correct answer to what this uncertainty adder should be.

On the one hand, increasing the test requirements by adding uncertainty adders will create more incentives for WEIM areas to procure more capacity in advance of the real-time market and will reduce the potential for one area to rely on WEIM to meet its load. On the other hand, it would be prohibitively expensive to adopt test requirements designed to ensure that each balancing area can meet its full imbalance requirements 100 percent of the time with just the resources made available to the real-time market in that area. Therefore, the question of how to set an uncertainty adder is a policy question that can only be answered through debate and consensus among the balancing areas participating in the WEIM.

DMM understands that the ISO and many stakeholders believe the quantile regression methodology the ISO is developing requires further assessment before being implemented in the sufficiency tests. Even after more development, DMM expects the quantile regression adder to fluctuate significantly, interval by interval, making it very difficult for balancing areas to reproduce or predict in advance. Therefore, DMM continues to recommend that the ISO and stakeholders consider developing much simpler and more transparent uncertainty adders in the next phase of this initiative.

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<sup>3</sup> *Opinion on Energy Imbalance Market (EIM) Resource Sufficiency Evaluation Enhancements, Phase 2*, Market Surveillance Committee, Revised Draft, December 4, 2022. <http://www.caiso.com/Documents/MSCDraftOpinionResourceSufficiencyEvaluationEnhancementsPhase2.pdf>

## **ENERGY STORAGE ENHANCEMENTS**

### **Improving the availability of ancillary services**

During the stakeholder process, DMM and the ISO both noted that a number of issues have been identified which can limit the ability of storage resources to provide ancillary services awarded through the market and to maintain the feasibility of those awards in real-time. To address some of these issues, the ISO included two enhancements in the final proposal:

- The estimated impact of regulation awards on state of charge will be modeled, and
- All ancillary service awards for storage resources will be required to be accompanied by real-time energy bids (in the opposite direction) for up to 50 percent of the ancillary service award quantity.

DMM supports each of these proposed enhancements. DMM appreciates the functionality to allow hourly multipliers in the estimated impact of regulation awards on state of charge, rather than a static multiplier value for all hours of the day. However, DMM notes that the ISO confirms in the final proposal that it does not yet have a developed approach to calculate these multipliers. DMM recommends the ISO develop and codify such an approach before finalizing this market design change.

While DMM supports the proposed requirement for real-time energy bids to accompany ancillary service awards, DMM believes this proposal would be strengthened by retaining the earlier proposed requirement to have real-time energy bids accompanying 100 percent of ancillary service award quantities. During the stakeholder process, the ISO has not explained the rationale for only requiring energy bids for 50 percent of ancillary service awards. Requiring energy bids for 100 percent of ancillary service awards ensures that the market has maximum flexibility to move the resource to maintain ancillary service awards needed for reliability.

### **Exceptional dispatches**

The ISO proposes to enable ISO operators to issue exceptional dispatches for energy storage resources in terms of a required state of charge, rather than just for operating at a specific operating level. DMM believes this will be a significant improvement to existing processes.

Issuing exceptional dispatches to batteries as state of charge values could help prevent instructions from being infeasible and could mitigate instances of resources being forced to either discharge or charge uneconomically to meet these instructions. Issuing exceptional dispatches as state of charge values could also allow batteries more flexibility to maintain existing ancillary service awards and could provide resources more flexibility to capture additional revenue opportunities before the time at which the ISO determines it needs the resource to be at a specific level of charge.

### **Compensating exceptional dispatches based on opportunity cost**

The ISO proposes to compensate energy storage resources for opportunity cost of missed market opportunities when exceptionally dispatched to hold state of charge. Compensating resources based on opportunity costs in this situation is reasonable and the specific

approach described in the final proposal appears to be a further improvement over approaches presented in the earlier straw proposals.

### **Co-located resources**

The ISO proposes enhancements that will limit the charging instructions of co-located storage resources to the dispatch operating target of one or more co-located variable energy resources. Storage resources will also be allowed to deviate when the variable energy resources are unable to produce the forecasted amount. The ISO is proposing these changes to address stakeholder concerns that some co-located storage resources are limited in their ability to charge from the ISO grid in order to maintain preferential tax treatment.

DMM does not oppose these enhancements. However, DMM notes that developing a reasonable model for incorporating the investment tax credit (ITC) reductions into bids could be significantly more efficient than most co-located resources constraining themselves to never charge from the grid. This approach could represent a long-term solution available to all resources with such limitations now or in the future.

Also, co-located storage resources that can never charge from the grid will be less flexible and less able to provide capacity at all critical hours than standalone storage resources that can charge from the grid. Therefore, co-located resources that are constrained to not charge from the grid should receive a lower resource adequacy capacity rating than storage resources that can charge from the grid.

### **Default energy bids for energy storage resources**

DMM supports the ISO's proposal to introduce an opportunity cost component to the day-ahead default energy bids for energy storage resources. The existing day-ahead default energy bid for storage resources does not include an opportunity cost component, based on the theory that explicit inclusion of intraday opportunity cost is not necessary when resources are optimized over a full 24-hour period. As the ISO has observed and as further explained in prior DMM comments, this theory does not hold unless certain assumptions about the bid set are satisfied.<sup>4</sup>

The ISO's proposed approach to including opportunity cost in the day-ahead default energy bids for storage resources is likely to improve the ability of the day-ahead market to accurately reflect intraday opportunity costs when storage resources when bid mitigation occurs. However, DMM continues to recommend that the ISO consider a more precise estimate of hourly opportunity cost that can reflect changing opportunity costs throughout the operating day.

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<sup>4</sup> *Comments on Energy Storage Enhancements – Second Revised Straw Proposal*, Department of Market Monitoring, August 4, 2022. <http://www.caiso.com/Documents/DMM-Comments-Energy-Storage-Enhancements-Second-Revised-Straw-Proposal-Aug-4-2022.pdf>

### **Bid cost recovery**

DMM remains concerned about potential bid cost recovery gaming opportunities related to state of charge limits for batteries. In light of the significant and growing volume of battery resources (and bid cost recovery payments to these resources) in the ISO market, DMM recommends that the ISO consider enhancements to avoid unnecessary bid cost recovery and mitigate potential gaming opportunities related to state of charge limitations.