

Memorandum

To: ISO Board of Governors

From: Benjamin F. Hobbs, Chair, ISO Market Surveillance Committee

Date: December 9, 2021

Re: Briefing on MSC activities from October 27, 2021 to December 2, 2021

This memorandum does not require Board action.

During this time period, the MSC helped to organize an expert forum on energy storage and markets on October 28, 2021, which was moderated by the MSC chair. The MSC also held a general session meeting on November 19, 2021. The two topics addressed during the meeting were, first, the sources of potential benefits of the proposed imbalance reserves component of the day-ahead market enhancements initiative and, second, a discussion of the resource sufficiency evaluation redesign initiative.

October 28, 2021 Storage Forum: Energy Markets for the Future

The purpose of the forum was to convene four national experts on storage and markets to discuss the following three sets of questions:

1. Do U.S. ISO-based markets include products to ensure reliable operations with deep penetrations of renewables and storage? Is storage paid appropriately it provides to the system? Are market power issues inherent in new or existing market designs?
2. Are models today missing critical aspects to operate or procure storage resources? Are additional market enhancements necessary to foster storage participation?
3. Do current market constructs favor one technology (i.e. lithium-ion) more than others? Might different constructs be needed for medium & longer duration storage?

The intent of this discussion was to provide background and perspectives on the issues being addressed in the ISO's storage enhancement initiative.

The experts included:

- Dr. Ross Baldick, Professor Emeritus, Department of Electrical & Computer Engineering, University of Texas
- Dr. Luke Lavin, Researcher III, Grid Systems Group, National Renewable Energy Laboratory
- Dr. Nikita Singhal, Technical Leader, Grid Operations & Planning Group, Electric Power Research Institute
- Dr. Ramteen Sioshansi, Professor, Departments of Integrated Systems Engineering and Electrical & Computer Engineering, Ohio State University

The discussion by the panelists of these questions and others submitted by audience members was preceded by a presentation by Gabe Murtaugh, Storage Sector Manager at the ISO of the status of storage and related market design features. Forum recordings and materials are available on the ISO website.¹

General Session Meeting of November 19, 2021²

1. Day-Ahead Market Enhancements: Potential Balances of Day-Ahead Imbalance Reserves

Mr. James Friedrich, Senior Policy Developer at the ISO begin this agenda item with a presentation that focused on the possible ways in which instituting day-ahead procurement of imbalance reserves could improve the efficiency of ISO management of net load uncertainty while maintaining system reliability. The fundamental point is that the present day-ahead residual unit commitment process, and operator upward adjustments to load forecasts used in that process, are likely to be an inefficient means of procuring flexible capacity that could be used to compensate for net load forecast errors in the ISO's real-time markets.

Mr. Friedrich and the MSC members discussed a number of potential studies that could help assess the extent to which the proposed imbalance reserve product could lower costs and enhance the effectiveness of day-ahead procurement of flexible capacity. Some of those studies are now being undertaken by ISO staff. Others, however, would require complex and costly development of counterfactual cases and market simulations that would likely be impractical.

An extensive discussion with stakeholders ensued on the reasons for and costs of procurement of flexible capacity via residual unit commitment versus the proposed imbalance reserve. Mr. Friedrich concluded the presentation by briefly highlighting the advantages of an imbalance reserve market for facilitating efficient procurement of reserves in the proposed enhanced day-ahead market.

2. Resource Sufficiency Evaluation Enhancements

The ISO is proposing to enhance the resource sufficiency evaluation process in order to better ensure that each balancing area authority in the energy imbalance market has sufficient capacity available to meet its net fifteen minute demand, accounting for uncertainty in net-scheduled interchange.³ As summarized in the September 14, 2021 Board memo, before the ISO runs the real-time market, the ISO applies tests for each balancing area authority in the market to assess the feasibility of base schedules, determine whether the base schedule of supply and demand balance, and assess the sufficiency of resource capacity and flexible ramping capacity to meet demand. If a balancing authority has sufficient resources, the entity is deemed to be able to meet their area's demand with their own net-supply, and is then allowed to transfer power with other entities through the EIM real-time market. Improved accuracy of the evaluation process will better characterize the ability of balancing area authorities to meet their obligations, without undue risk of

¹<http://www.caiso.com/informed/Pages/MeetingsEvents/PublicForums/Default.aspx>

²<http://www.caiso.com/Pages/documentsbygroup.aspx?GroupID=DC0EDF86-F39F-4E7E-87B2-2FCD359B6A9F>

³<https://stakeholdercenter.caiso.com/StakeholderInitiatives/EIM-resource-sufficiency-evaluation-enhancements>

restricting power exchanges unnecessarily.

This agenda item consisted of a two-part presentation by Dr. Guillermo Bautista-Alderete, Director of Market Analysis and Forecasting at the ISO. First, he reviewed the definition and justification of the resource sufficiency evaluation process in the energy imbalance market. That part of the talk also included a summary of sources of incremental capacity, especially for the stressed conditions during July 8-10, 2021, as well as the three components that made up the requirement for incremental capacity: potential incremental load, intertie deviations, and uncertainty adders. Dr. Bautista-Alderete extensively discussed the challenges in projecting the amount of incremental capacity that are available when applying the resource sufficiency test. He reviewed the forecasts of hydro, multi-stage generator, solar, wind, storage, and other capacity made on July 9 in the three real-time markets: the hour-ahead scheduling process, the fifteen-minute market, and the five minute real-time dispatch market. He discussed the levels of, and reasons for, errors in the forecast amounts.

The second part of his presentation concerned the role of operator-imposed load conformance adjustments in the real-time markets. He discussed the purpose of load conformance (for positioning resources prior to the five-minute market, and to true up imbalances in the five-minute market). The focus of this part of the presentation on load conformance was because of its potential contribution to high levels of import transfers into the California ISO from the rest of energy imbalance market. Dr. Bautista-Alderete showed data that indicated that load conformance was only one of many factors, and did not bear most of the responsibility for those imports. A careful analysis of the July 9 availability of flexible capacity concluded this part of the presentation. The MSC and stakeholders expressed their appreciation for the presentation of detailed data and explanation of the events of that day, along with a desire to dig even more deeply into the issue.