

Memorandum

To: ISO Board of Governors

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

Date: July 15, 2020

Re: **Briefing on MSC activities from March 19, 2020 to July 13, 2020**

This memorandum does not require Board action.

During the period covered by this memorandum, the MSC held three general session meetings by webinar on May 8, 15, and 29, 2020.¹ The topics addressed are briefly summarized below. For each topic, MSC members, ISO staff, and stakeholders discussed the relevant ISO initiative along with stakeholder questions and concerns.

The MSC plans to hold its next general session meeting on July 30, 2020.

General Session Meeting of May 8, 2020

This general session meeting had two discussion topics: Phase 4 of the ISO's energy storage and distributed energy resources initiative, and import bidding and market parameters under Federal Energy Regulatory Commission (FERC) Order 831.

Energy Storage and Distributed Energy Resources Initiative, Phase 4

This session began with a presentation by Gabriel Murtaugh, ISO Lead Policy Developer; Bridget Sparks, Infrastructure and Regulatory Policy Developer; Jill Powers, Infrastructure and Regulatory Policy Manager; and Lauren Carr, Infrastructure and Regulatory Policy Specialist. An overview was given of how storage services are offered into the ISO's markets, followed by a review of variable storage costs that might be considered when constructing default energy bids. These variable costs can include charging energy, losses, opportunity costs, and cycling costs. The latter two are particularly challenging to storage assets. For cycling costs, the ISO is now proposing a simpler approach than it previously considered. The end-of-hour state-of-charge parameter proposal was then discussed, which would allow more flexibility in how a storage resource is operated compared to self-schedules, but still give the resource owner a significant degree of control over operations. Finally, the presentation reviewed the proposal for a demand response to specify a maximum number of run hours during a given day. Dr. Scott Harvey, Member of the MSC, then made a formal presentation in which he highlighted several complications in the economic operation

¹All presentations and recordings of the meeting can be found at <http://www.caiso.com/informed/Pages/BoardCommittees/MarketSurveillanceCommittee/Default.aspx>

and bidding of storage resources. He emphasized how the market software's treatment of separate bids to sell energy and offers to buy charging energy and the modeling of losses could result in implicit calculation of charge-discharge cycle costs in a way that is inconsistent with the resource's actual costs, even if the resource attempts to bid truthfully.

FERC Order 831

A presentation was made by Brittany Dean and Danielle Tavel of Market Design Policy of two aspects of the ISO's proposed response to this Order. The first aspect concerns modification of the ISO market software's penalty parameters in order to be consistent with the doubling of the energy bid cap to \$2000/MWh. The second aspect addresses screening of import offers that exceed the previous bid cap of \$1000/MWh. Among the issues discussed was the assumed hourly profile of relative prices used in the screening process to translate prices of multihour blocks of power into hourly prices; it was pointed out by an MSC member that it is not known whether the average monthly profile is very different from profiles typical of high price days. Extensive discussion also occurred of the logical relationship of the penalty price parameters to the opportunity costs faced by resources providing capacity ("resource adequacy") to the ISO market, and to scarcity values when the West as a whole is short of power.

General Session Meeting of May 15, 2020

The agenda of this meeting included two major topics that represented continuations and extensions of discussions during the MSC general session meeting of March 13, 2020. These included performance of the congestion revenue rights auction, and the ISO's system market power initiative.

Congestion Revenue Rights

Dr. Guillermo Bautista-Alderete, Director of Market Analysis and Forecasting at the ISO, presented a summary of the May 12, 2020 Congestion Revenue Right (CRR) Market Analysis Report. The emphasis of the presentation was on the development of a revised metric of the efficiency of markets for auctioning and reconfiguring CRRs, in terms of the relationship of the prices paid for those rights versus the congestion revenues they provide to the holder. This revised metric was devised due to the inability to precisely estimate the CRR payments for allocated CRRs being sold after the implementation of the pro-rata funding, and to isolate the effects of sales of rights that were originally allocated free of charge to market parties. The argument for this revision was that any deviations between the resale price of allocated rights and the congestion revenues they earn should not be viewed as a flaw of the auction process itself, but a reflection of buyer and seller (mis)valuations.

Dr. Bautista-Alderete then described changes in the markets for congestion revenue rights since the Phase 1A and 1B reforms. Those reforms altered what rights could be auctioned, and how payments to those rights would be reduced if implicit flows from those rights exceed network constraint capacity. The latter situation that could result in ISO congestion revenues being insufficient to cover payments to rights holders (a situation called "congestion rent shortfall"). Trends since 2017 in auction revenues, types of rights that were traded, activity in the annual and monthly markets, rent shortfalls, and the revised metric of market efficiency

were described. The network constraints most responsible for shortfalls and the underlying reasons were described. The conclusion of the presentation was that the reforms have considerably enhanced efficiency of the congestion revenue rights market, and that much of the auction shortfall is due to arbitrage from the annual to the monthly markets.

System Market Power

This agenda item began with a presentation by Perry Servedio, Lead Market Design Policy Developer at the ISO. This presentation provided details on the ISO's revised proposal for identifying when system market power has a high likelihood of being present in the ISO's energy markets. This identification is based on the relationship of California ISO energy prices to energy prices in other balancing areas within the energy imbalance market; if certain conditions are satisfied, then a pivotal supplier test is triggered. If the test is failed, then suppliers that are found to be jointly pivotal within the California ISO balancing area would have their offers mitigated; meanwhile, resources outside that area would not be mitigated, nor would non-pivotal suppliers. In addition, Mr. Servedio described several possible improvements to the trigger.

Extensive discussion among MSC members, ISO staff, and stakeholders addressed issues such as the alternative of using a conduct-and-impact test; the tradeoff between the risk of underestimating variable costs when setting default energy bids versus the risk of allowing some market power to be exercised if those defaults are set too high; the treatment of imports that are contracted to provide resource adequacy in California; and whether marginal cost-based prices in California discourage imports associated with external resources that have significant start-up costs.

General Session Meeting of May 29, 2020

This, like the other two general session meetings in May 2020, had an agenda consisting of two major topics. In this meeting, the topics included enhancements to the flexible ramping product and the hybrid resources initiative.

Flexible ramping product enhancements

This agenda item began with a presentation by Donald Tretheway, Senior Advisor, Market Design Policy of the ISO's proposal to ensure that flexible ramping product acquired in the ISO's real-time markets is actually deliverable. Technical details of the proposal were summarized, in which two additional net load scenarios would be included in the market software involving, respectively, a higher and lower net load ramp throughout the system than forecast. Although there are many possible scenarios that would require delivery of energy from acquired ramping product, it is believed by the ISO that including two extreme cases would go a long way towards ensuring deliverability for most unanticipated ramping situations.

An earlier proposal by the ISO would have resulted in virtual supply and demand not paying or receiving, respectively, shadow prices in the real-time markets associated with the additional net load scenarios. However, the MSC pointed out that the resulting difference between prices for virtual and physical supply would provide incentives for implicit virtual bidding (through under- or over-scheduling in the day-ahead market relative to actual intended production) in order to arbitrage that difference. MSC members discussed the desirability of virtual bidding in order to

incentivize commitment of physical supply in places where energy or ramp is needed. The ISO stated its intention to modify the proposal to avoid a difference between prices for virtual and physical energy.

Hybrid storage-generation resources

Gabriel Murtaugh started this agenda item with a presentation summarizing the ISO's proposal to manage co-located and hybrid resources. Co-located resources are resources with separate Resource IDs but are located behind a single point of interconnection whose congestion must be managed. Hybrid resources are a resource with a single Resource ID but multiple mixed-fuel components, all of which are behind a single point of interconnection.

Several features of the ISO's proposal were described and discussed by the ISO staff, MSC members, and stakeholders. One is the "dynamic limit" tool. Even though hybrid resources may include storage, for simplicity the ISO proposes to manage them as a simple resource that submits a single bid curve to the day-ahead and real-time markets. In order to deal with state-of-charge limits that may prevent dispatch consistent with the bid curve, the ISO proposes to deploy a complementary "dynamic limit" tool to account for state-of-charge or other limits.

A second feature of the proposal is to limit the total output of co-located resources to the capacity of the single interconnection point, rather than restrict their individual maximum output parameters ("Pmax") in order to guarantee feasibility. This would provide more flexibility in dispatching the resources. Congestion revenues associated with the flow limit of the interconnection point would then, in essence, flow to the resources by paying them the higher energy price on the system side of the constraint. The possibility of a game in which resources attempt to expand output beyond the interconnection limit to take advantage of that higher price is recognized by the ISO. Therefore, the ISO proposes to threaten to impose tight Pmax values on the co-located resources if such behavior occurs.

One concern that has not been addressed by the ISO is how to manage a hybrid or co-located resource's charging from the grid in a way that does not endanger their eligibility for renewable investment tax credits. Mr. Murtaugh described several alternative ways that this constraint could be managed by the resource and the ISO, and invited stakeholder comment on which approach would be preferred. MSC members expressed concern over inefficient system operations due to this artificial incentive.