Comments on Storage Bid Cost Recovery and Default Energy Bid Enhancements

August 19, 2024 Stakeholder Meeting

Department of Market Monitoring

August 26, 2024

DMM appreciates the opportunity to comment on the *Storage Bid Cost Recovery and Default Energy Bid Enhancements August 19th, 2024 stakeholder meeting*.[1]

DMM supports extending the timeline for the stakeholder process

DMM understands that the ISO's expeditious timeline for this initiative was driven by an urgency to address issues quickly after publically discussing the shortcomings of the current storage bid cost recovery (BCR) design. However, if the ISO has concluded that it is infeasible to adopt its straw proposal within the initially proposed timeline, DMM supports extending the timeline to allow for further discussion and development of a complete approach that fully addresses the real-time BCR issues for batteries.

Many stakeholders have expressed concern about the expedited pace of the initial timeline and have asked the ISO to extend the timeline. In addition to requesting an extended timeline, some stakeholders have proposed alternative interim approaches to the ISO's straw proposal. These interim approaches would only partially address the issues identified with storage BCR. Importantly, none of the alternative proposals presented by stakeholders would address the real-time bidding incentives created by the current BCR design, which can lead to inefficient dispatch based on bids below real-time marginal cost.

DMM does not believe the ISO should rush to implement interim measures that only address gaming concerns or other limited scenarios created by the actions of scheduling coordinators. The gaming concerns identified are a symptom of the core incentive issues created by the current BCR rules, and while addressing other scenarios that result from scheduling coordinator actions ought to be addressed, the ISO's straw proposal would negate the need for an incomplete interim approach that narrowly targets specific scenarios.

DMM supports the ISO's revised timeline to work through a proposal that addresses the core issues of real-time battery BCR. Taking additional time is better than pushing through an interim solution with little vetting and limited long-term value. To address concerns of public discussion of the current BCR design shortcomings and potential gaming opportunities, we emphasize that DMM closely monitors bid cost recovery paid to battery storage resources. Further, we understand that the ISO is doing so as well, with extra scrutiny throughout this policy development process.

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[1] *Storage Bid Cost Recovery and Default Energy Bid Enhancements*, California ISO, August 19, 2024: https://stakeholdercenter.caiso.com/InitiativeDocuments/Presentation-Storage-Bid-Cost-Recovery-and-Default-Energy-Bids-Enhancements-Aug-19-2024.pdf

Track 1 should address the real-time bidding incentives created by the current BCR design

Throughout the stakeholder process, many have raised the issue of potential gaming or actions by "bad actors". Some stakeholders have proposed an approach discussed in the August 19 working group meeting that would narrowly target this potential source of BCR for battery storage resources. DMM agrees that the potential for gaming bid cost recovery (BCR) payments by batteries is concerning, and one purpose of the straw proposal and this initiative is to mitigate gaming concerns. However, an interim approach that only targets gaming concerns would not address other important efficiency and reliability concerns created by current BCR rules. The Track 1 process should address all three concerns: gaming, market efficiency, and reliability.

The ISO's straw proposal to eliminate real-time BCR for battery storage resources driven by state-of-charge constraints would address all three concerns identified above. The straw proposal would fix the core issue that current BCR rules create an incentive for batteries to bid below expected opportunity costs in real-time, in a manner that can result in battery capacity being discharged prior to the peak net load hours.

A primary purpose of BCR is to incentivize efficiency through marginal cost bidding. The current BCR design for batteries does the opposite, and instead creates incentives to bid inconsistent with real-time marginal cost. DMM believes it is important to address this fundamental design issue simultaneously with all real-time storage BCR issues, rather than classifying the market efficiency and reliability issues as a lower priority to be taken up at a later time. We note that implementing the changes proposed in the Track 1 straw proposal should not preclude additional discussion and further changes in Track 2 of the stakeholder process.

Additional analysis is needed to assess the potential impacts of mitigation under proposed real-time BCR changes

Default energy bids (DEBs) for battery storage resources are based on day-ahead prices that may not reflect real-time intraday opportunity costs. Because of this, local market power mitigation could cause storage resources to be discharged or forgo charging at a price below their actual real-time opportunity cost as determined by expected real-time prices. This can lead to a storage resource being in a discharged state or having state-of-charge depleted before reaching hours with day-ahead discharge schedules, and potentially incurring losses associated with buying back the day-ahead schedules.

The ISO, the Market Surveillance Committee (MSC), and DMM have all noted the potential impacts of mitigation as described above. In the August 19 working group meeting, the ISO presented data in an attempt to assess the potential magnitude of the issue. From this analysis, and by citing previous DMM reports, the ISO concluded that incremental dispatch caused by mitigation is uncommon—among batteries and overall.

The incremental dispatch due to mitigation presented in DMM's reports was estimated using the actual bids submitted to the market. Further, the ISO's analysis was presented at a daily level, without consideration of potential mitigation impacts in specific hours of the day. As discussed in this stakeholder process, current BCR rules imply that historical bids are not likely to include an accurate representation of real-time intraday opportunity costs. Eliminating BCR associated with buying back or selling back day-ahead schedules due to binding state-of-charge constraints would likely incentivize resources to increase bids in some hours to better reflect intraday opportunity costs. This could lead to a

larger potential impact of mitigation than suggested by historical analysis, especially in hours with significant real-time intraday opportunity costs.

DMM recommends the ISO refine their analysis of the potential impacts of mitigation under the proposed storage BCR changes to assess hourly impacts, and account for changed bidding incentives under the proposed BCR rule changes. DMM is also working on data analysis to help stakeholders better understand the potential impacts of battery mitigation under the ISO's proposed BCR changes for battery storage resources.

DMM notes that the ISO likely needs to address the mitigation issue described here, even if incremental dispatch caused by mitigation is relatively uncommon and further analysis suggests it is likely to be uncommon moving forward. Some battery resources are subject to mitigation more often than others—particularly batteries in load pockets. These resources may be disproportionately impacted when mitigation results in incremental dispatch based on a mitigated bid below the resources' marginal cost. Further, when battery DEBs do not include intraday opportunity costs, mitigated bids will be below real-time marginal cost, which undermines the main purpose of this initiative: to have those costs represented in energy bids used by the market.

Track 1 may need to address potential impacts of mitigation before the longer effort to improve default energy bids for storage resources

The establishment of more dynamic DEBs considering real-time conditions reduces the risk of mitigation to a value that does not reflect real-time intraday opportunity costs. However, development of such a DEB is a longer-term effort that will not be addressed in Track 1. Therefore, an alternative approach may be needed in Track 1 to avoid potential impacts of mitigation to values that may not reflect real-time intraday opportunity costs.

As one potential solution to the mitigation issue, the Market Surveillance Committee (MSC) proposed that when storage resources are dispatched on mitigated bids, the ISO could apply the same settlement as used for storage exceptional dispatches to hold state-of-charge (SOC).[2] The payments to resources exceptionally dispatched to hold SOC are calculated by estimating a counterfactual dispatch at the intervals after the start the exceptional dispatch through the end of the trade day. This counterfactual dispatch maximizes the resource's profits, given the actual locational marginal price (LMP), assuming the exceptional dispatch did not occur. If the counterfactual payments are higher than the actual payments, the difference is paid to the resource.[3]

As proposed by the MSC, this method could be used to calculate payments to batteries that have schedules incrementally dispatched in real-time due to market power mitigation that lowers bids below the resource's intraday opportunity costs. This approach could similarly address situations where mitigation to a low charging bid results in foregone charging that would be profit maximizing for a later discharge opportunity. This settlement would calculate the real-time incremental revenues occurring over the hours following mitigation, and compare to a counterfactual real-time settlement as if the

[2] *Storage Resource Bid Cost Recovery Rules*, Scott Harvey, Market Surveillance Committee, July 30, 2024: https://www.caiso.com/documents/presentation-storage-resource-bid-cost-recovery-msc-jul-30-2024.pdf

[3] *Energy Storage Enhancements: Final Proposal*, California ISO, October 27, 2022: https://stakeholdercenter.caiso.com/InitiativeDocuments/FinalProposal-EnergyStorageEnhancements.pdf

mitigation had not occurred. If the counterfactual without mitigation would have resulted in higher revenues, the battery would be made whole for this difference.

This settlement approach would ensure that when batteries are subject to mitigation, they are equitably compensated for any lost revenues that can result when the current Energy Storage DEB option does not reflect actual real-time opportunity costs. However, this settlement approach will not completely prevent inefficient dispatch in real-time that can be caused when bids are mitigated based on current DEBs. Therefore, this settlement approach would not negate the need to develop more accurate battery DEBs in Track 2, but could be a workable solution to consider in Track 1.

DMM supports the ISO's consideration of this potential solution to mitigation in Track 1, while scoping development of improved storage DEBs in Track 2. In order to mimimize uplift paid under this potential approach, DMM recommends that if adopted, this additional settlement be limited to resources that have actively elected in MasterFile to use the storage default energy bid methodology where available.[4]

Battery DEBs should more accurately reflect potential real-time intraday opportunity costs

As discussed in prior DMM comments, without real-time BCR payments that cover losses from day-ahead schedule buybacks or sellbacks when state-of-charge (SOC) constraints are binding, batteries need to manage the risk of losses with real-time bid prices.[5] These bids are the primary determinant of how the real-time market software dispatches batteries above or below the batteries' day-ahead schedules. In order to dispatch batteries efficiently, bids should reflect the potential opportunity costs of charging or discharging batteries differently in the real-time market (particularly for day-ahead schedules in hours beyond the real-time advisory lookout). Therefore, default energy bids (DEBs) for batteries used when bid mitigation is triggered also need to reflect potential opportunity costs of dispatching batteries in the real-time intervals leading up to the day-ahead schedules. More generally, DEBs for batteries need to reflect the real-time opportunity cost of dispatching before reaching a dispatch opportunity in a future hour.

Currently, batteries can opt to have default energy bids for the real-time market that include an opportunity cost component based on the fourth highest resource locational marginal price from the day-ahead market, plus a 10 percent adder.[6] The option may be effective and efficient in many instances. However, in real-time, these DEBs may be insufficient to capture intraday opportunity costs associated with potentially higher real-time prices based on changing real-time conditions. Further, the current DEB design is a static value over all hours of the operating day and does not consider changing intraday opportunity costs throughout the day. This can lead to a DEB that is too high in some hours,

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[4] When resources fail to designate the storage DEB as their top choice of DEB methodology in MasterFile, a DEB will instead be generated using the cost-based methodology applied to all other non-gas resources. This will produce a DEB for storage resources that is less than $1, far below a reasonable estimate of intraday opportunity costs. Although the competitive LMP will serve as a floor for mitigated bids, failure to designate the storage DEB can increase the likelihood that bids will be lowered due to mitigation and lead to incremental dispatch.

[5] *Comments on Storage Bid Cost Recovery and Default Energy Bids: July 8, 2024 Workshop*, Department of Market Monitoring, July 18, 2024: https://www.caiso.com/documents/dmm-comments-on-storage-bcr-and-default-energy-bids-july-8-2024-workshop-jul-18-2024.pdf

[6] For a four hours energy storage resource. For an N hour energy storage resource, it would be the Nth highest day-ahead LMP. See Appendix D, Market Operations Business Practice Manual, p 310: https://bpmcm.caiso.com/Pages/BPMDetails.aspx?BPM=Market%20Instruments

and too low in other hours. DMM recommends the ISO develop DEBs that could be higher in the intervals leading up to the peak pricing hours, and lower in later intervals as intraday opportunity costs fall.