Comments on Price Formation Enhancements:

Rules for Bidding above the Soft Offer Cap Straw Proposal

Department of Market Monitoring

April 30, 2024

Summary

The ISO's Straw Proposal provides feedback on the proposals made by stakeholders for an interim solution that allows resources with daily energy limitations to bid above the $1,000/MWh bid cap in summer 2024. The Straw Proposal also provides some clarification on the scope of solutions that may be feasible to implement in summer 2024.

DMM agrees conceptually that resources with daily limitations should be able to reflect intra-day opportunity costs in energy bids and default energy bids (DEBs). In previous comments, DMM expressed support for a short-term solution for summer 2024 that would allow storage and select hydro resources to reflect intra-day opportunity costs exceeding $1,000/MWh in a limited number hours in which these costs may be applicable.[1] However, there is very little time remaining to develop and implement an approach for summer 2024. Further, the ISO has clarified that there are numerous technological constraints that significantly limit potential solutions that could be implemented by August 1. One such limitation the ISO clarified would not be feasible by August 1 is changing the current software logic to more accurately align bid caps with intra-day opportunity costs of storage resources on an hourly basis, so that bid cap increases were only applied to hours in which opportunity costs should be applicable.

The large number of battery resources also appears to make a manual solution infeasible for all batteries and hydro resources that may have significant daily energy limitations on days when the bid cap is raised above $1,000/MWh. In addition, data reviewed by DMM indicates that in practice, the $1,000/MWh cap has only been binding for a relatively small portion of battery capacity (i.e., about 15 percent) on a sample of days when the bid cap was raised above $1,000/MWh. Given all this, DMM believes it may appropriate to defer changes to bidding rules for storage resources until a more comprehensive solution can be developed.

For summer 2024, DMM recommends that the ISO focus on improving the ability of the small number of hydro resources with daily energy limitations to reflect intra-day opportunity costs in bids and DEBs, and rely on existing mechanisms for managing storage resources until a more comprehensive solution can be implemented. DMM also recommends the ISO add a policy initiative in the near future focused on designing hourly DEBs for batteries and hydro resources that face intra-day opportunity costs above $1,000/MWh on days when the bid cap is raised above $1,000 for some hours.

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[1] *Comments on Price Formation Enhancements: Rules for Bidding above the Soft Offer Cap Issue Paper*, Department of Market Monitoring, April 22, 2024: https://www.caiso.com/Documents/dmm-comments-on-price-formation-enhancements-rules-for-bidding-above-the-soft-offer-cap-issue-paper-apr-22-2024.pdf

Comments

DMM agrees conceptually that resources with daily limitations should be able to reflect their intra-day opportunity costs in incremental energy bids and reference levels. In previous comments, DMM recommended an interim approach for summer 2024 that allows bids and/or reference levels (DEBs) of resources with daily limitations to exceed the $1,000/MWh soft cap during the hours when their intra-day opportunity costs may exceed $1,000/MWh.[2] On days where the $2,000/MWh bid cap is in effect, intra-day opportunity cost could exceed $1,000/MWh in the hours prior to the highest priced hours. DMM emphasized that the change should not be applied all day, particularly for resources able to recharge throughout the day, and should not apply during the highest priced hours when the intra-day opportunity costs are lowest.

As an interim solution, DMM supported increasing the bid cap for storage and hydro resources in the hours where their intra-day opportunity costs are likely to exceed $1,000/MWh. DMM's recommendation was to only increase the bid cap during the hours where intra-day opportunity costs are most likely to exceed $1,000/MWh, rather than all day. The hours where intra-day opportunity costs may exceed $1,000/MWh are those leading up to the highest priced hours on days where the $2,000/MWh hard cap is in effect, but not during the highest priced hours. The number of hours where intra-day opportunity costs may exceed $1,000/MWh prior to the highest priced hours will be dependent on the prices on that day, the daily limitations of the resource, and its ability to recharge.

In the Straw Proposal presentation on April 23, the ISO stated that current software has limitations in the logic it can use to apply the adjusted bid cap to a subset of hours. However, the ISO found that changing DEBs and reasonableness thresholds for storage and hydro resources, and enhancing the ability of these values to vary conditionally throughout the day, would be infeasible in the short-run.[3] The ISO instead focused on alternatives that increased the bid cap for storage and hydro resources, as well as removing the $1,000/MWh bid cap from the default energy bid (DEB) calculation for all resources in all hours.

Given the time constraints and software limitations explained by the ISO, DMM recommends the ISO focus on a solution for the handful of hydro resources with daily energy limitations. One potential solution could be to improve the process for these few hydro resources with daily limitations to request revised DEBs. This could be through establishing a framework to approve manual reference level change requests for hydro resources described in the BPM.[4] DMM's understanding is that the software is capable of receiving manual reference level change requests from hydro resources, but the ISO does not have a framework in place for approving these requests. If a framework could be developed that took into account the relevant intra-day prices and hourly limitations of the particular hydro resource, then

[2] Ibid.

[3] The ISO indicated that changing the DEB calculation would be infeasible in the short-run. As for the reasonableness threshold and bid cap, DMM understands that the current market software allows some hourly variation in reasonableness threshold and bid cap, but that this logic is limited to a particular form. DMM understands the ISO to have indicated it is not feasible to modify to be conditional, such as being in effect for a set window of hours preceding the four highest priced hours of the day when the $2,000/MWh hard cap is effect.

[4] Business Practice Manual for Market Instruments, pp 462-464.

this proposal could potentially target the specific hydro resources that have daily limitations and are facing intra-day opportunity costs over $1,000/MWh on $2,000/MWh bid cap days.

According to the BPM for Market Instruments, the ISO can change a DEB to its manually requested DEB during the operating day, extending to the end of the day.[5] If this functionality exists, it seems possible to enter another DEB later in the day as well that would override the earlier submitted value. This ability could allow for manually requested DEBs to apply in the subset of hours where intra-day opportunity costs are in effect, rather than during the highest priced hours and afterwards when the resource faces no intra-day opportunity cost. This approach would only target hydro resources that have daily energy limitations rather than applying this flexibility to all hydro resources. If the manual reference level change process is able to revert the DEB back to the capped value later in the day, this approach would be able to raise the DEB and bid cap only in the appropriate hours. Thus, DMM asks that the ISO review its ability to update DEBs established through the manual reference level change request later in the day, so that resource bid caps could be reset at or below the $1,000/MWh cap during later hours of the day when prices are the highest (i.e., usually hour 17 or 18 to hour 20 or 21).

DMM understands that battery resources may also have intra-day opportunity costs that exceed $1,000/MWh on days when the $2,000/MWh bid cap is in effect. However, because storage resources are able to replenish throughout the day, there are likely only a handful of hours at most where their intra-day opportunity costs may exceed the $1,000/MWh soft cap on days when the hard bid cap is in effect. The ISO has indicated that it will not be able to implement an appropriate policy targeted only at the hours battery resources should have more bidding flexibility, and there are too many battery resources in the CAISO footprint and the WEIM to rely on a manual process like the one suggested above. Further, analysis of real-time bid data on a sample of recent high priced days indicates that the $1,000/MWh soft offer cap has not historically been binding for the vast majority of storage capacity.

DMM analyzed storage behavior on two days where the $2,000/MWh bid cap was in effect: September 6, 2022 and August 16, 2023. This analysis shows that on this sample of recent high priced days, most storage capacity (e.g., about 85 percent) did not bid at the $1,000/MWh cap during the hours in which their intraday opportunity costs are highest. Figures 1 and 3 show the capacity weighted average real-time bid price for CAISO batteries, system marginal energy cost (SMEC) prices across markets, and the maximum import bid price on these two days. Figures 2 and 4 show the volume of submitted real-time bids by price range in each hour on September 6, 2022 and August 16, 2023, respectively.

[5] Ibid.

Figure 1. Prices, bid cap, and capacity weighted average real-time storage bids
September 6, 2022

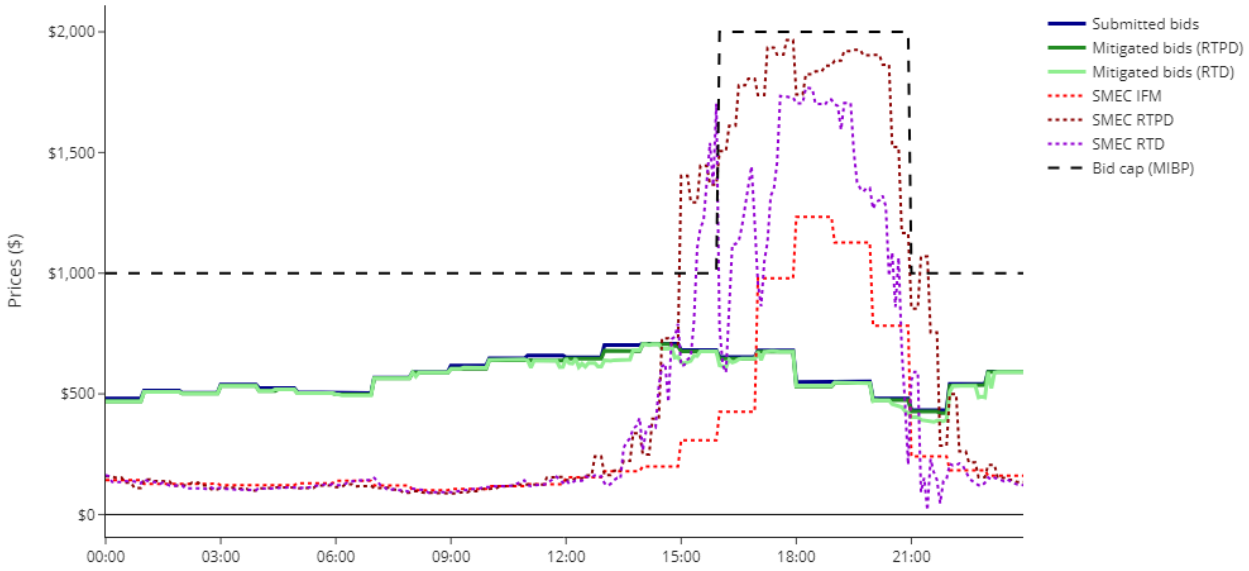


Figure 2. Prices of unmitigated storage discharge bids
September 6, 2022

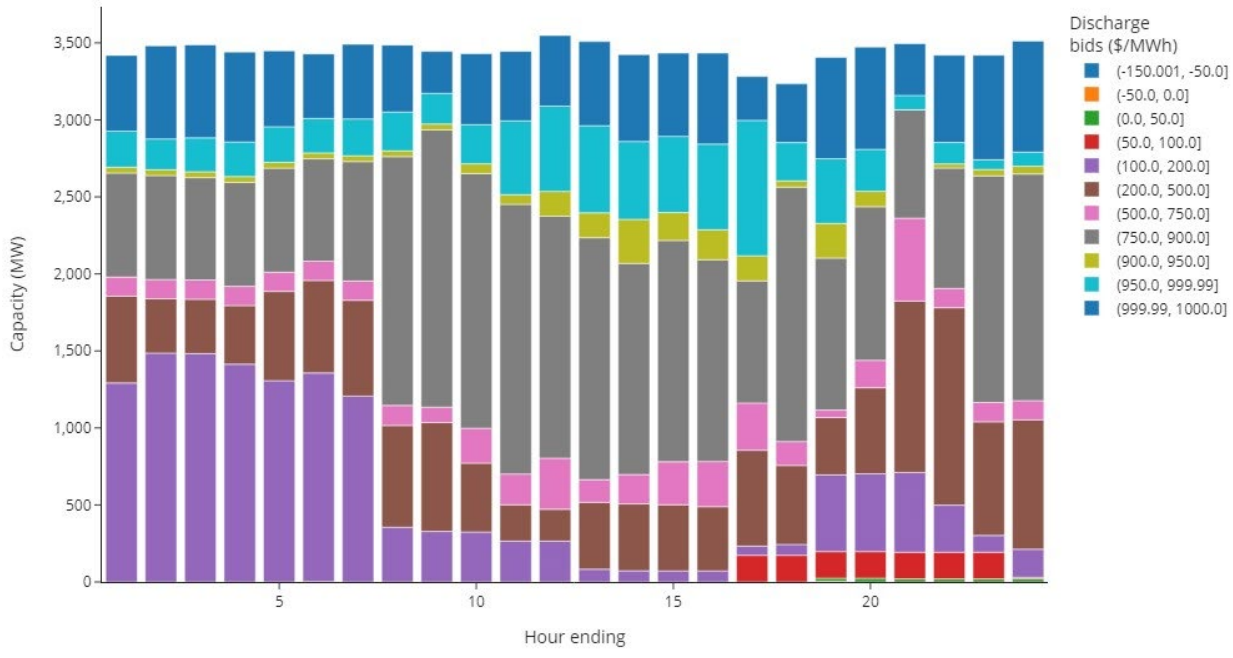


Figure 3. Prices, bid cap, and capacity weighted average real-time storage bids
August 16, 2023

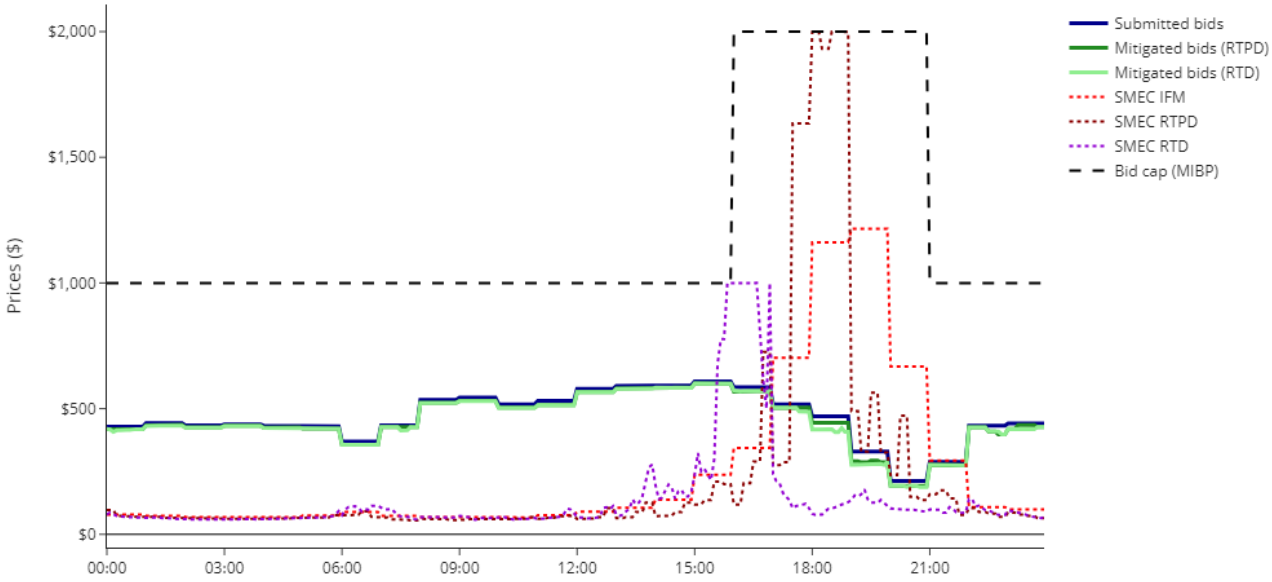
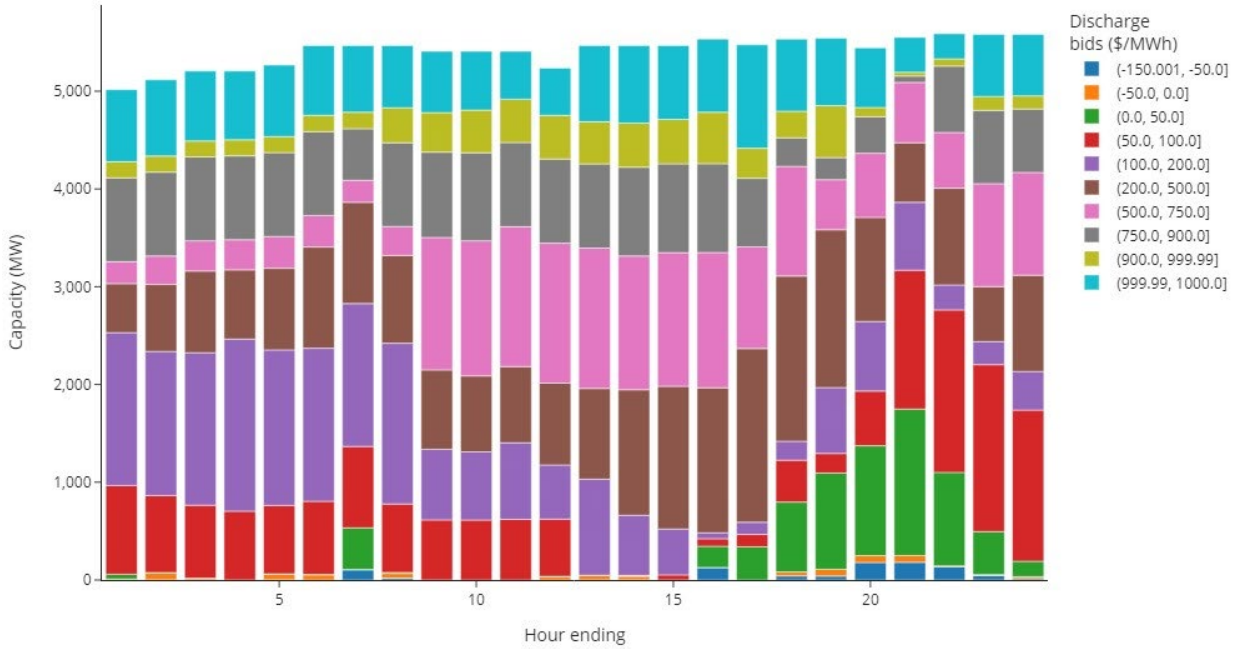


Figure 4. Prices of unmitigated storage discharge bids
August 16, 2023



Figures 1 and 3 illustrate that while the storage capacity weighted average discharge bid price is elevated leading up to the highest priced four hours on both days, it does not approach the current soft offer cap of $1,000/MWh. In addition, these figures also show that bid mitigation has been minimal for battery resources on these days. Figures 2 and 4 show that while there is some increase in overall bid prices on September 6, 2022 approaching the highest priced hours, and a slight increase in capacity bid at the $1,000/MWh cap on August 16, 2023 in hour 17, for many resources on these days, the bid cap was not the limiting factor.

The data shown in the figures above should not be interpreted as evidence that it would be unnecessary to allow bids over $1,000/MWh in some hours, as storage resources may still face intra-day opportunity costs over $1,000/MWh in a limited number of hours. However, the fact that the $1,000/MWh bid cap has not historically been binding for a significant share of storage capacity provides additional context around the urgency to quickly implement a short-term solution for summer 2024.

DMM believes the best approach to allowing batteries to reflect intra-day opportunity costs in their bids and DEBs is to create a new hourly DEB that directly accounts for these costs. DMM recommends that the ISO begin a stakeholder initiative focused on improving the storage DEB to allow for an hourly value that includes intra-day opportunity costs appropriate for each hour. This hourly value could then be used to allow bids over $1,000/MWh in appropriate hours when the calculated hourly DEB exceeds $1,000/MWh.

In the interim, in order to ensure system reliability, the ISO can continue to rely on the tools it has to dispatch storage resources, such as enhanced exceptional dispatch ability and exceptional dispatch settlement rules for storage resources. DMM also notes that storage resources currently receive real-time bid cost recovery associated with buying back day-ahead schedules that are infeasible in real-time due to insufficient state of charge. While DMM recommends revisions to bid cost recovery rules for storage resources, this source of bid cost recovery currently mitigates the financial risk associated with buying back a day-ahead schedule following an early discharge in hours when the resource may not have been able to reflect intra-day opportunity costs.