Comments on Price Formation Enhancements

Scarcity Pricing Working Group Sessions – November 10 and 20, 2025

Department of Market Monitoring

December 12, 2025

Summary

The Department of Market Monitoring (DMM) appreciates the opportunity to comment on the ISO's *Price Formation Enhancements Working Group Sessions* held on November 10 and November 20, 2025.[1] In the November 2025 working group meetings, stakeholders primarily discussed three issues:

(1) combining scarcity pricing with balancing authority area (BAA) market power mitigation (MPM) enhancements into one final price formation enhancements proposal,

(2) the purpose and scope of comprehensive scarcity pricing enhancements, such as a new reserve product or a latent supply construct, and

(3) whether development and implementation of comprehensive scarcity pricing should be a near term or longer term effort.

DMM does not have concerns moving forward with the proposed BAA MPM changes independent of scarcity pricing enhancements. DMM continues to support long-term pricing enhancements such as an uncertainty product that allows prices to rise gradually, or other mechanisms such as participating demand in real-time. However, DMM does not see the need to implement these pricing mechanisms concurrently or prior to BAA MPM in the short-term.

Some stakeholders have argued that administrative scarcity pricing is necessary to ensure reliability and to attract additional supply and investment in additional capacity. DMM notes that these arguments are most applicable to energy-only markets. The CAISO market operates within a robust resource adequacy framework and therefore administrative scarcity pricing plays a small role in attracting capacity or long-term investment to California.

When considering the scope and applicability of scarcity pricing enhancements, DMM notes that scarcity pricing mechanisms may be unnecessary in the day-ahead market, because the day-ahead market already accounts for uncertainty and provides an avenue for demand to reflect economic willingness to be curtailed.

DMM supports an increase of demand-side participation in the real-time market as an improvement to pricing during scarcity events, as discussed by stakeholders in the working group meetings.

[1] *Price Formation Enhancements – Working Group Sessions 14 and 15*, California ISO, November 10, 2025 and November 20, 2025: https://stakeholdercenter.caiso.com/StakeholderInitiatives/Price-formation-enhancements

Comments

DMM does not have concerns moving forward with the proposed BAA MPM changes independent of scarcity pricing

The ISO proposed combining BAA MPM enhancements and scarcity pricing into one final proposal, suggesting that BAA MPM enhancements (specifically subjecting the California ISO to BAA-level MPM) cannot be implemented without scarcity pricing.[2] Some stakeholders expressed concern that implementing BAA MPM enhancements without scarcity pricing could lead to inefficiently low prices during tight conditions and reduce the incentive for external supply to sell into the CAISO market. This argument appears to suggest that in the absence of both a scarcity pricing framework and BAA MPM, external supply may only be incentivized to sell into the CAISO market when prices are elevated by the exercise of market power under tight supply conditions.

DMM does not believe it is necessary or appropriate to rely on the exercise of market power to attract additional supply in scarcity conditions. The ISO's maximum import bid price is designed to ensure that the opportunity cost of selling in bilateral markets outside of CAISO can be appropriately captured in bid prices when supply is tight around the west. Under true scarcity conditions, mitigation of market power applied to resources within the CAISO balancing area should not prevent available supply offered to the CAISO market from clearing at prices up to the maximum import bid price.[3]

If additional capacity is needed in scarcity conditions within the CAISO BAA beyond what is awarded by the market, ISO operators can utilize manual dispatch on the interties, transactions that are typically paid as bid. While there may be reasons such supply is of limited availability during regional high load events, the structure of CAISO's maximum import bid price should diminish the risk that such supply is not available to the CAISO market due to better economic opportunities elsewhere. Market based outcomes under current market rules, and limited use of manual dispatch where necessary, are likely more efficient than allowing exercise of BAA level market power with the goal of attracting more supply to the CAISO balancing area. This is especially true given the infrequency of scarcity events.

DMM does not suggest using manual actions as a replacement for long-run pricing enhancements. For example, pricing enhancements that allow prices to rise gradually ahead of scarcity events would allow access to supply that may be unavailable if prices only rise at the moment scarcity is realized. However, DMM highlights that there are other tools the ISO may use in the short-term to meet reliability needs in

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[2] *Price Formation Enhancements Working Group Session 14,* California ISO, November 10, 2025, p 7: https://stakeholdercenter.caiso.com/InitiativeDocuments/Presentation-Price-Formation-Enhancements-Nov-10-2025.pdf

[3] As described in Attachment P of the Business Practice Manual for Market Instruments, the maximum import bid price is determined by bilateral prices outside of the ISO market and will allow bids up to $2,000/MWh when certain conditions occur in the ISO market. These criteria will likely be satisfied on days when scarcity is possible during west-wide tight supply conditions. DMM recognizes that the ISO's maximum import bid price design has potential to introduce the impacts of market power in areas outside the CAISO BAA that influence bilateral prices into ISO market clearing prices. However, this is a distinct issue from the question of whether supply would not be offered to the ISO market due to an inability to receive prices potentially elsewhere outside the ISO market.

rare scarcity events, even if BAA MPM were to be implemented independent of scarcity pricing. Continuing to allow any exercise of BAA-level market power is likely to only result in higher market clearing prices and is not necessary to ensure reliability during extreme system conditions.

DMM is not opposed to combining BAA MPM enhancements and scarcity pricing into one final proposal but notes that scarcity pricing is not inherently necessary for implementing BAA MPM enhancements in the short-term. DMM acknowledges that scarcity pricing can be highly administrative and can take a wide variety of forms. The details of implementing an efficient scarcity pricing mechanism will take time to develop, and if combined with BAA MPM, could unnecessarily delay the implementation of MPM enhancements in the short-term.

DMM continues to recommend the ISO create an hour-ahead uncertainty product

DMM continues to recommend that the ISO prioritize the development of a new hour-ahead uncertainty product that would allow the real-time market to better reflect real-time conditions and provide earlier price signals prior to a scarcity event.[4] An uncertainty product with a time horizon longer than one interval would allow capacity and energy prices to rise gradually and reflect upcoming scarcity in more distant advisory intervals. This could allow more capacity to be positioned to respond to upcoming scarcity events. Additionally, a longer uncertainty horizon could mitigate the need to consider other scarcity pricing mechanisms, such as administrative pricing for emergency actions.

Scarcity pricing may play a limited role in attracting capacity or long-term investment to California, as the CAISO market has a robust resource adequacy framework

Some stakeholders argue that scarcity pricing is intended to attract capacity or long-term investment to California. This type of argument is most applicable to energy-only markets that do not have a resource adequacy framework or capacity market. Such arguments do not apply as directly to the CAISO market, which has a robust resource adequacy framework that requires sufficient capacity procurement.

Instead of attracting capacity and long-term investment, scarcity pricing in the CAISO market primarily would function to attract supply during tight market conditions. More specifically, DMM supports the implementation of pricing enhancements such as a new uncertainty product that would allow gradually increasing prices to better dispatch and position resources in anticipation of a scarcity event. This would improve the ability to dispatch additional supply in an upcoming hour in anticipation of an upcoming scarcity event.

[4] *2024 Annual Report on Market Issues and Performance,* Department of Market Monitoring, August 7, 2025, pp 27-28: https://www.caiso.com/documents/2024-annual-report-on-market-issues-and-performance-aug-07-2025.pdf

Scarcity pricing mechanisms may be unnecessary in the day-ahead market

The ISO proposed the idea of applying scarcity pricing mechanisms to the day-ahead market.[5] DMM notes that scarcity pricing mechanisms may be unnecessary in the day-ahead market, because uncertainty and demand's willingness to be curtailed are both already accounted for in the day-ahead market.

Scarcity pricing attempts to quantify the expected value of lost load, considering an estimate of load's willingness to pay and the probability of curtailment as reserves are depleted. In real-time, this essentially acts as a proxy for demand that is not participating economically. While a significant portion of load self-schedules as a price taker in the day-ahead market, load can participate with economic bids in the day-ahead timeframe. If some portion of demand is fully participating, there may be less need to estimate the value of lost load because demand can signal its willingness to curtail through bids. The amount of economically participating load may be sufficient to resolve potential scarcity conditions in the day-ahead market. The day-ahead market enhancements introduction of imbalance reserve capacity and reliability capacity is likely to further negate the need for scarcity pricing in the day-ahead timeframe.

Because the CAISO day-ahead market already includes some participating demand, imbalance reserves that procure capacity to meet net load uncertainty, and procurement of reliability capacity to meet forecasted demand, DMM believes scarcity pricing is likely unnecessary in the day-ahead timeframe.

DMM supports an increased role of demand-side participation in real-time

In the November 20, 2025 working group meeting, stakeholders argued that providing more optionality and flexibility to demand-side resources could improve scarcity pricing by better incorporating demand's willingness to curtail load in real-time. DMM agrees that there is a role for increased demand-side participation in real-time. If demand were able to signal its willingness to curtail through real-time bids, the market could more efficiently dispatch limited supply during tight conditions. With increased demand-side participation, the market could potentially avoid dispatching the next marginal supply-side resource in the bid stack or relaxing the power balance constraint and triggering administrative pricing. This could avoid unnecessary price spikes during tight conditions, when price responsive demand is willing and able to economically curtail.

DMM notes that demand-side participation in real-time could be a market-based approach that is less administrative and provides a response to tight conditions other than just extremely high prices. This approach could be uniformly applied to Western Energy Imbalance Market (WEIM) entities, as it is not contingent upon other market design elements such as ancillary services procurement. Where technologically feasible, DMM sees this as a viable option for incremental enhancements to price formation in the CAISO market.

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[5] *Price Formation Enhancements Working Group Session 14,* California ISO, November 20, 2025, p 26: https://stakeholdercenter.caiso.com/InitiativeDocuments/Presentation-Price-Formation-Enhancements-Nov-20-2025.pdf

As part of CAISO's Demand and Distributed Energy Market Integration (DDEMI) Working Group, DMM has discussed its support for increased demand-side participation and has noted that real-time load bidding for resources that are able to respond to real-time economic signals could increase market reliability and efficiency.[6] DMM supports further discussion of demand-side participation as a price formation issue.

[6] *Comments on Demand and Distributed Energy Market Integration Working Group,* Department of Market Monitoring, November 6, 2025: https://www.caiso.com/documents/dmm-comments-on-demand-and-distributed-energy-market-integration-working-group-nov-06-2025.pdf