

Comments on Day-Ahead Market Enhancements: Third Revised Straw Proposal

Department of Market Monitoring

May 19, 2022

The Department of Market Monitoring (DMM) appreciates the opportunity to comment on the *Day-Ahead Market Enhancements: Third Revised Straw Proposal*.¹

I. The ISO and stakeholders should strongly consider merging the DAME initiative into the EDAM initiative to focus on what is necessary for the EDAM design to determine the capacity in each balancing area that will have a real-time must offer obligation

DMM is not convinced that the imbalance reserve design would significantly increase overall efficiency of the CAISO BA resource adequacy and spot markets in the absence of an extended day-ahead market (EDAM). As described in more detail in Section II below, the imbalance reserve product has some complicated design issues that may be difficult to resolve in the near term. Given the ISO's current timeline for completing and implementing an EDAM design, DMM recommends that the ISO focus its efforts on the aspects of day-ahead market enhancements (DAME) that may be needed to complete the EDAM design in the EDAM initiative. This would facilitate considering other potential day-ahead capacity procurement options that may be needed to complete a reliable, equitable EDAM design.

Relative to maintaining the real-time must offer obligation for CAISO balancing area resource adequacy in the absence of an EDAM, DAME proposal may not meaningfully increase overall efficiency of CAISO balancing area resource adequacy and energy markets

The proposal argues that the DAME design is an important enhancement to the CAISO BA's day-ahead markets, and implies that the ISO would implement the DAME design even if the EDAM is not ultimately implemented. DMM appreciates that the ISO has explained the benefits that the DAME design may provide. However, DMM is not convinced that these potential benefits will be significant relative to the potential reliability risk of eliminating the current real-time must offer obligation for resource adequacy (RA) resources and the increased costs in the day-ahead market. In the absence of further analysis indicating these risks and costs are outweighed by potential benefits (such as co-optimizing uncertainty-driven commitments and schedules with energy and ancillary services in IFM), DMM recommends that the DAME design not be a constraint on the EDAM design. In the following subsections, we briefly explain some

¹ *Day-Ahead Market Enhancements: Third Revised Straw Proposal*, CAISO, April 27, 2022: <http://www.caiso.com/InitiativeDocuments/Third-Revised-Straw-Proposal-Day-Ahead-Market-Enhancements.pdf>

concerns about the size of potential benefits relative to costs of proceeding with the DAME design in the absence of EDAM.

Potential Costs

As explained in prior comments and in Section II below, removing the real-time resource adequacy must offer obligation, and instead relying on imbalance reserves to ensure real-time bids will cover the 97.5% uncertainty level (or less), could create reliability concerns for the CAISO balancing area.² The proposal explains that the design should not create a concern because “CAISO will maintain the ability to exceptionally dispatch resources not scheduled in the day-ahead market.”³ If resource adequacy resources have to make themselves available for real-time exceptional dispatch even if they do not receive an energy, imbalance reserve, or reliability capacity award, this would alleviate much of the reliability concern. However, this would nullify what the proposal lists as the second most significant benefit: allowing resource adequacy resources not needed for reliability on a given day or hour to avoid the costs of making themselves available between the day-ahead and real-time market.

If resource adequacy resources need to be available in real-time even if they do not receive any kind of day-ahead schedule, these resources will not avoid this cost, and therefore will not be willing to accept lower resource adequacy contract payments from potential avoidance of this cost. Moreover, under the proposal, in the 2.5% or more of intervals when the realization of upward uncertainty exceeds the real-time must offer obligations, the resource adequacy capacity that did not receive day-ahead awards may not have their energy bids included in the real-time market energy supply stack. This would restrict real-time market supply relative to all resource adequacy resources having a real-time must offer obligation. This could increase real-time prices when the uncertainty materialization is high, but the CAISO does not need to exceptionally dispatch these resources.

The ISO has also suggested that from the perspective of consumers, the payments to generation resources in the day-ahead market for imbalance reserves and reliability capacity should be offset by reductions in resource adequacy contract prices. This could potentially occur if (1) there were no market power in the resource adequacy market; (2) there were not already long-term contracts signed for much of the resource adequacy capacity; and (3) generators could have sufficient knowledge about what their compensation for imbalance reserves and reliability capacity would be when signing resource adequacy contracts. However, none of these conditions are true. In particular, over the last several years, DMM has observed indications of significant market power in the local resource adequacy market for many local areas and in the system resource adequacy market in the summer months.

² DMM *Comments on Day-Ahead Market Enhancements Revised Straw Proposal*, August 18, 2021: <http://www.caiso.com/Documents/DMM-Comments-on-Day-Ahead-Market-Enhancements-Revised-Straw-Proposal-Aug-18-2021.pdf>

³ DAME third revised straw proposal, p.9.

As a result, DMM does not expect expected imbalance reserve and reliability capacity payments to reduce resource adequacy capacity payments in any amount close to the amount of actual day-ahead market imbalance reserve and reliability capacity payments. Therefore, we expect this trade-off to be a net cost to the end-use customer.

Potential Benefits

We briefly discuss the potential benefits listed by the proposal and possible issues that could reduce these benefits.

- **Imbalance reserves co-optimized with energy and ancillary services in the IFM, rather than procured in RUC.** DMM understands that this co-optimization could provide some benefits. It is not clear that this will be a substantial enough benefit to offset the costs described above associated with procuring imbalance reserves in the IFM. The ISO lists the benefits as more optimal unit commitment decisions and more optimal allocation of system ramping capability. If the IFM knew that additional import resources and long-start resources were going to be committed in residual unit commitment (RUC), some short-start units might not receive day-ahead energy or RUC schedules. However, with or without the imbalance reserve product, the real-time market will re-optimize the unit commitment of all resource adequacy resources besides long-start resources. Therefore, short-start units that ultimately do not receive binding start-up instructions in real-time will buy back their day-ahead schedules. As a result, this benefit may not be that significant. We look forward to seeing if the ISO could develop a reasonable estimate of the magnitude of this potential benefit.
- **Flexible reserves procured based on costs represented by imbalance reserve bids.** As explained above, this is not a benefit but would be a net cost given that resource adequacy resources without day-ahead awards still need to incur the costs to be available for potential exceptional dispatch in the real-time market, but they may not make their energy bids available to reduce real-time market prices.
- **Imbalance reserves ensure system has sufficient ramping capability.** Assuming the shown resource adequacy fleet is sufficient to meet CAISO BA reliability needs, the ISO should be able to ensure sufficient ramping capacity has a real-time must offer obligation without an imbalance reserve product. The ISO can do this through a combination of the existing real-time must offer obligation for resource adequacy resources and by adjusting RUC to commit long-starts and hourly block imports.
- **Deliverability of capacity through imbalance reserve is more sophisticated than capacity procured through RUC adjustments.** An alternative to imbalance reserves could simply be potential adjustments to the granularity of uncertainty incorporated into RUC. For example, instead of crude system load forecast adjustments, uncertainty at more granular load levels and generation locations could be considered.

- **Procuring flexible reserves in the IFM better ensures that IFM export schedules are “feasible”.** The ISO explains that procuring flexible reserves in the IFM will better ensure IFM export schedules will be closer to RUC export schedules. We agree. However, if this potential benefit were realized, it would come with an associated cost that would likely significantly outweigh this potential benefit.

The proposal explains that the IFM export schedules would in theory be closer to RUC export schedules if CAISO BA operators stop incorporating load and resource uncertainty into RUC. However, the proposed imbalance reserve demand curve design will allow exports self-scheduled into the IFM (or bid into the IFM at a high bid price) to have a higher priority than procuring imbalance reserves above the 77.5% uncertainty level. If CAISO BA operators do not incorporate load and resource uncertainty into RUC, exports that received IFM and RUC awards will need to be cut by the real-time market in situations when this upward uncertainty (above the 77.5% or 97.5% threshold) is realized in real-time. This design may result in RUC export awards being more similar to IFM export awards. But if that is the case, it would also result in RUC export awards being less likely to be feasible in real-time in tight west-wide conditions like those experienced in August and September of 2020. We believe this would be a worse outcome for WECC reliability than the current design. Currently, when exports receive IFM awards but do not receive a RUC award, the export scheduling coordinator is warned that they may not be able to count on the day-ahead market export out of CAISO in real-time.

- **Imbalance reserves will encourage more 15-minute import schedules.** The proposal implies that because imbalance reserves will be limited to capacity that is dispatchable within 15 minutes, hourly block imports will be incentivized to become 15-minute dispatchable so that they can be eligible to receive imbalance reserve awards. As explained in prior comments, a significant portion of uncertainty between the day-ahead and real-time markets would be realized more than an hour before the real-time interval. However, the ISO’s proposal is to limit imbalance reserve eligibility to only capacity that can be ramped up within 15 minutes. This is likely to reduce eligible supply of imbalance reserve capacity and result in IFM costs being significantly higher than needed to ensure that the capacity without IFM energy schedules which have real-time must offer obligations is sufficient to meet the CAISO BA reliability needs.⁴ It is extremely unlikely that this extra cost would be outweighed by the purported flexibility benefit of imports that otherwise would be hourly block converting to being 15 minute dispatchable.
- **Imbalance reserves align the CAISO resource adequacy resources with other EDAM participants.** As described more below, we recommend that the EDAM initiative consider other potential design options besides imbalance reserves in order to complete a reliable, equitable EDAM design.

⁴ DMM August 18, 2021 DAME comments, pp. 4-5.

In EDAM initiative, ISO should continue considering other potential day-ahead capacity procurement options that may better complete the EDAM design

Imbalance reserve and reliability capacity up products designed in this DAME initiative may ultimately be the best option for the EDAM's initial implementation. However, DMM is concerned about how the details of the EDAM RSE, imbalance reserve product, RUC, real-time must offer obligation and WEIM RSE design will work together. It is not yet clear how, or if, these elements will combine in an EDAM design that will meet the reliability needs of participating EDAM BAs, while equitably determining capacity requirements and discouraging capacity leaning.

As the ISO and stakeholders attempt to determine a feasible EDAM-WEIM design, it may be valuable to leave open the possibility of other options besides imbalance reserves and reliability capacity for determining the minimum real time must offer obligations for each EDAM balancing area. As described above, in the absence of EDAM, the current DAME design may not meaningfully decrease the overall costs of the CAISO BA's resource adequacy and spot energy markets. Therefore, we recommend the ISO and stakeholders not allow the current DAME design to limit the EDAM design. Instead, we recommend the ISO and stakeholders continue considering other potential day-ahead capacity procurement options that may better facilitate design compromises that may be needed to complete a reliable, equitable EDAM design.

II. Comments on current imbalance reserve design

This section contains brief comments on the current imbalance reserve design.

Imbalance reserve requirements need further review to ensure adequate real-time must offer obligations.

As discussed in previous comments, if imbalance reserves are relied on to provide sufficient real-time must offer obligations to ensure reliability, procuring capacity to meet 97.5% or less of net load errors may not be sufficient. With these requirements, in about 2.5% of real-time intervals or more—over half an hour each day—the ISO would expect to rely on operating reserves or regulation procured in the day-ahead market to meet real-time energy shortfalls caused by higher than expected net load outcomes.⁵

Further, this puts more pressure on the requirement calculations. More subtle estimation issues become more important. For example, the estimation of the net load forecast pools errors across an area. So if in one interval wind generation in the south falls, and wind generation in the north increases, these offset to reduce the overall observed net load error in that interval. However, if congestion constrains north to south flows, then an increase in wind generation in the north must be met with a reduction of other generation in the north and may

⁵ DMM *Comments on Day-Ahead Market Enhancements Second Revised Straw Proposal*, August 18, 2021: <http://www.caiso.com/Documents/DMM-Comments-on-Day-Ahead-Market-Enhancements-Revised-Straw-Proposal-Aug-18-2021.pdf>

not actually offset the decreased wind in the south. This effect can cause an under estimation of the errors. The potential significance of this underestimation may be larger when the CAISO uses the estimation for reliability purposes and setting real-time must-offer obligations.

As discussed in Section I above, the proposal explains that the requirement being too low to meet actual reliability needs should not cause reliability concerns because all short-start resource adequacy capacity that does not receive a day-ahead energy, imbalance reserve, or RC award would still have to be available in real-time to respond to exceptional dispatches if required. However, long-start resource adequacy resources and import resource adequacy may not be available to respond to exceptional dispatch within the real-time market time horizon. Given that an energy shortage every half hour clearly does not meet reliability standards, operators will still need to regularly perform out-of-market actions in RUC, post-RUC, and in real-time in order to meet the CAISO BA's reliability requirements under this proposal.

DMM suggests that the ISO consider studying whether a reserve margin should be added to the upward requirement in order to help ensure that the amount of capacity required to bid into the real-time markets meets reliability targets such as less than 1 day of load shed every 10 years, without the need for regular use of manual operator interventions.

Local market power mitigation is an important component of the proposal

The products introduced by the day-ahead market enhancements would be local and transmission constrained. Local market power could clearly exist for these products. Imbalance reserve bids could be used to exercise market power not only for reserves but also, as the CAISO proposal showed, for energy. Therefore, local market power tests and mitigation are an important component of the proposal.

Imbalance reserve product definition would change with adjustable parameter

The CAISO proposes to make the time period over which imbalance reserves must be deliverable an adjustable parameter. But this parameter is fundamental to what the product is. For example, spinning reserves must be reachable within 10 minutes — making them a 10-minute product. Without knowing whether imbalance reserves are 15-minute, 30-minute, 60-minute, or some other duration, one cannot know what the product actually is. The CAISO also does not explain how, and with what criteria, it will determine when adjustments would be made. Not knowing what the product will be makes it difficult to assess and provide more specific comments.

Unclear why imbalance reserves are not settled at locational prices

The CAISO proposes to settle imbalance reserve suppliers at local prices, but not settle imbalance reserve costs to load at local prices. Instead, the total payments to imbalance reserve suppliers at local prices will be calculated, and those payments will be allocated to load.

While imbalance reserve demand would be determined by the CAISO and not participant bids, this is largely true of real-time load as well. Real-time load is settled at local prices for the location at which the load is modeled as withdrawn.⁶ The CAISO should clarify why imbalance reserve costs that will be allocated to load and other drivers of uncertainty will not be calculated based on the prices and quantities at the locations imbalance reserves are modeled as withdrawn.

The real-time market needs to be able to hold and access reserves procured in day-ahead market.

As discussed in previous comments, the real-time market should have mechanisms to efficiently decide whether or not to hold onto flexible reserves procured in the day-ahead market. If the real-time market does not have a mechanism to maintain these reserves, the value of procuring them in the day-ahead market could be significantly reduced.⁷

⁶ Real-time load is settled at the weighted average of the real-time local prices.

⁷ DMM Comments on Day-Ahead Market Enhancements Second Revised Straw Proposal, August 18, 2021, pp. 1-2: <http://www.caiso.com/Documents/DMM-Comments-on-Day-Ahead-Market-Enhancements-Revised-Straw-Proposal-Aug-18-2021.pdf>