



### Day Ahead Market Enhancements (DAME) Initiative

Stakeholder comment themes across proposal iterations and ISO responses that informed the revised final proposal

May 2023

Topic	Stakeholder Position	ISO Reply
Need for imbalance reserve product	<p>Entities both inside and outside the ISO BAA largely agree on the need for an imbalance reserve product, support the product's development, and agree that the product will improve reliability and price efficiency. Stakeholders support the ISO's analysis that the imbalance reserve product will achieve these objectives by ensuring the day-ahead market schedules sufficient flexible reserves to meet net load imbalances and ramping needs that materialize between the day-ahead and real-time markets. Stakeholders agree that there is a clearly demonstrated need to reduce out-of-market actions and address imbalances between markets that will be addressed by the imbalance reserve product. Stakeholders also largely agree that the imbalance reserve product will enhance diversity benefits for EDAM participants and is an important component of the EDAM proposal. Stakeholders support the ISO's analysis that imbalance reserves will reduce each EDAM BAA's individual net load uncertainty requirements, build confidence in energy transfers between BAAs scheduled in the day-ahead market, and more efficiently reserve resource capacity by allowing BAAs access to resources across the EDAM.</p>	<p>The declining predictability of energy imbalances between the net load forecasted in the day-ahead market and the net load forecasted in the real-time market is creating the need for system operators to increasingly rely on out-of-market actions to procure additional capacity. The proposed imbalance reserve product will ensure the day-ahead market schedules sufficient flexible reserves to meet net load imbalances and ramping needs that materialize between the day-ahead and real-time markets.</p>
	<p>Despite being broadly supportive of the imbalance reserve product, a diverse array of stakeholders expressed a desire for the ISO to provide a more robust benefit analysis of the imbalance reserve product, with some of these stakeholders withholding their support for the product until a more thorough net benefits analysis could be provided. Although the entities acknowledged the general utility of the imbalance reserve product, they expressed concern that inefficiencies and costs associated with the complexity of the design might outweigh the potential benefits, particularly</p>	<p>In response to stakeholder requests, a sensitivity analysis to elaborate on the impact of the ability to address uncertainty and flexibility requirements in the day-ahead market was included the ISO-commissioned EDAM benefits study published in November 2022. Study results showed the ability to address uncertainty and flexibility is an important component in realizing the regional dispatch efficiency, and found that without the ability to address</p>



	<p>for specific EDAM participants. These stakeholders included: CalCCA, CPUC Public Advocates Office, NV Energy, Powerex, Salt River Project, SCE, Six Cities, and WPFT.</p>	<p>uncertainty and flexibility in the day-ahead market, the EDAM benefit would be about 60% lower.</p>
<p>Need for new downward reserve products</p>	<p>The ISO continues to receive questions about the need for the new downward reserve products, with some stakeholders asserting that the ISO has not provided sufficient evidence of the need for downward uncertainty products. These stakeholders include: Puget Sound Energy, CESA, Six Cities, and Vistra.</p>	<p>The imbalance reserve and reliability capacity products form the real-time must-offer obligations for EDAM entities, so it is important to consider both upward and downward directions. For imbalance reserves, the ISO has shown that uncertainty materializes rather symmetrically in both directions, so a downward uncertainty product is appropriate. There are potential EDAM entities that say the downward flexibility is important to them, so the downward product allows the day-ahead market the flexibility to accommodate needs of different BAAs for residual unit commitment (RUC), even if oversupply conditions were not as egregious for the ISO BAA, we cannot presume that will be the case generally for the EDAM or that oversupply conditions may increase as the generation fleet comprises higher amounts of wind and solar resources. Reliability capacity down also gives the market a way to manage oversupply or congestion conditions in RUC without operator out-of-market actions. Overall, introduction of these downward products to the day-ahead market maximizes the regional market’s flexibility for current and future system conditions and new day-ahead market participants.</p>
<p>Contractual settlement of imbalance reserves</p>	<p>California LSEs, the CPUC and the CPUC Public Advocate's Office maintain that the addition of the imbalance reserve product could result in double payments to generators until new RA contracts are negotiated, or unless new settlement mechanisms are developed to align imbalance reserve product revenues with RA contractual provisions. Some stakeholders, including PG&amp;E,</p>	<p>Management determined that parties to these contracts can address these issues between themselves given they are most familiar their contracts provided they provide the parties certain information. For example, certain stakeholders have indicated they can reconcile any double payment concerns</p>



	<p>SCE, and SDG&amp;E, contended that it would be more efficient and effective to let counterparties handle settlement of imbalance reserve revenues bilaterally. These stakeholders expressed they did not need an ISO settlement mechanism to facilitate reliability capacity revenues. However, other LSEs, including CalCCA and Six Cities, stated they don't have a mechanism to efficiently facilitate these bilateral settlement agreements.</p>	<p>provided the ISO provides a breakdown of the imbalance reserve marginal price by capacity versus opportunity cost. Management proposes to provide this information and continue to work with stakeholders to further refine what information they require to reconcile their contractual issues. For LSEs without the means to facilitate these contractual settlements bilaterally, the ISO will implement an RA “true up” mechanism within the ISO settlement system that will be available for a three-year period. Management commits to work with the CPUC and the contracting parties to provide specific solutions to existing contracts the parties to such contracts cannot reconcile based.</p>
<p>Day-ahead bidding rules</p>	<p>Stakeholders within the ISO BAA offered strong support for adding a requirement for RA resources to bid for imbalance reserves, agreeing that the MOO would help ensure sufficient imbalance reserves to meet the EDAM RSE and therefore reduce the risk of the ISO BAA not passing the EDAM RSE.</p>	<p>Consistent with the current must-offer requirement for resource adequacy resources, an RA day-ahead must-offer obligation was included in the Draft Final Proposal in response to stakeholder comments on the need for an RA must-offer requirement for imbalance reserves.</p>
	<p>Some stakeholders from the ISO BAA expressed concerns about asymmetrical participation between CAISO and non-ISO BAAs in EDAM due to the SO's RA program requirement that all RA capacity offer into the day-ahead market. ISO LSEs expressed concern that they would have no mechanism to hold back a portion of their RA capacity from supporting firm EDAM transfers.</p>	<p>The EDAM proposal includes a net export transfer constraint that allows EDAM entities to manage the amount of supply available to each BAA that can support EDAM export transfers out of the BAA. For the ISO BAA, this constraint can be utilized to address an asymmetry created by the RA MOOs, and would allow the ISO BAA to retain whatever capacity it deems necessary to manage its own reliability between the DA and RT markets.</p>
<p>Real-time bidding obligations</p>	<p>There is widespread support among entities within the ISO BAA for retaining the RA real-time MOO to ensure reliability under extreme or unexpected conditions.</p>	<p>Based on stakeholder feedback, this proposal keeps the resource adequacy real-time must-offer obligation in place.</p>



<p>Nodal vs zonal</p>	<p>Several parties expressed concerns that nodal procurement of imbalance reserves could add unnecessary complexity and delay DAME implementation, noting the challenges associated with deploying FRP. Some of these stakeholders have urged the ISO to adopt a zonal approach in order to simplify market design and reduce the need for additional elements like local market power mitigation. Stakeholders also questioned some of the assumptions made in the imbalance reserve deployment scenarios and its impact on price formation. Stakeholders that generally supported elements of the nodal approach include: BANC, California Department of Water Resources (CDWR), DMM, Middle River Power, PacifiCorp, Public Generating Pool, Sacramento Municipal Utility District (SMUD), SCE, Seattle City Light, and Tacoma Power. Stakeholders that generally supported elements of the zonal approach include: BPA, CalCCA, CESA, CPUC Public Advocates Office, NV Energy, Puget Sound Energy, SDG&amp;E, Vistra, and WPTF.</p>	<p>Nodal procurement has several benefits over zonal procurement, including:</p> <ul style="list-style-type: none"> <li>• Supports an operationally feasible and reliable day-ahead market by enabling the market to ensure the reserves are deliverable to locations where the uncertainty is expected to materialize without violating transmission constraints.</li> <li>• Assures the market would not award and pay for reserves on resources that are behind constraints and undeliverable in the day-ahead timeframe. Zonal procurement could lead to awarding and paying for reserves on resources that are knowingly behind constraints. Operators would need to continue to take out-of-market actions to make up for undeliverable imbalance reserves.</li> <li>• More accurate prices for imbalance reserve awards because they represent a locational value of flexible reserves.</li> <li>• Improves confidence in EDAM transfers by modeling the deliverability of imbalance reserves.</li> </ul> <p>To accommodate stakeholder concerns, the proposal includes an additional flexibility to the design described in the revised final proposal. Specifically, the ISO will implement the flexibility to activate/deactivate specific locational constraints if the need arises. In addition, the ISO will implement a tunable parameter to adjust the quantity of imbalance reserve awards that are evaluated against transmission constraints. These changes build into the market software an architecture that</p>
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		can accommodate a range of zonal/nodal designs.
Market Power Mitigation	<p>Default availability bid: several stakeholders, including BPA, REV Renewables, CESA, and Independent Energy Producers Association, objected to the default availability bid, stating that it is a one-size-fits all solution that is unnecessary due to local market power already being mitigated via default bids for energy, and expressed concerns that resources could be mitigated to a level that makes their bids uneconomic. Stakeholders further stated that the ISO already has access to mitigated energy through its energy markets and under the default availability bid proposal there is a significant risk of over-mitigation. These parties requested additional documentation regarding the methodology for setting the default availability bids.</p>	<p>The demand curve approach described in the revised final proposal reduces the need for local market power mitigation of upward imbalance reserves. Since the \$55/MWh administrative cap on imbalance reserves is equivalent to the proposed upward imbalance reserve mitigation price, there is no need to apply local market power mitigation to imbalance reserve bids. However, the proposal includes the local market power mitigation functionality to apply to upward imbalance reserve bids in the DAME implementation, even if the functionality is not immediately employed. This will provide the flexibility for local market power mitigation to be deployed if the need arises to adjust the imbalance reserve demand curve calculation.</p>
Imbalance Reserve Demand Curve	<p>In response to a number of penalty price structures proposed in previous DAME proposals, stakeholders expressed a range of opinions, but overwhelmingly supported a demand curve structure. Some stakeholders (DMM, NV Energy, SDG&amp;E) voiced that the penalty structure should relax at lower prices than were previously considered, with the EDAM resource sufficiency evaluation still ensuring there is sufficient supply of imbalance reserves across the EDAM footprint. Other stakeholders maintained that it is important to protect a significant quantity of imbalance reserves, even at high costs, to provide confidence in the day-ahead market solution and prevent entities from taking out-of-market actions to protect reliability (REV Renewables, BPA). Some stakeholders (CESA, AES) would be interested in lower penalty prices for imbalance reserve down since the operational consequences resulting from large downward uncertainty materializing is generally easier to manage and less costly.</p>	<p>Many options were considered over the course of the initiative, with previous DAME proposals suggesting various penalty price structures, ranging from demand curves to graduated penalty prices to strict penalty prices to a hybrid approach. After considering the hybrid approach in the draft revised final proposal, further evaluation and stakeholder feedback revealed that this approach could lead to high prices that exceed the operational benefit of the product. In response to stakeholder feedback during the extended stakeholder engagement period, the proposal includes an imbalance reserve demand curve for all EDAM BAAs, including the ISO BAA, and cap the imbalance reserve up and down demand curve values at \$55. \$55 represents the “avoided cost” of replacing the loss of imbalance reserves</p>





	<p>As for the final proposal, some stakeholders support the proposed demand curve as a measure to tradeoff the value and cost of reserves, but other stakeholders express concerns about the proposed \$55/MWh imbalance reserve price cap without the ISO providing further justification (BPA, Middle River Power, NV Energy, PG&amp;E, Powerex, Public Power Council, REV Renewables, Six Cities, Vistra, Wellhead Electric Company, WPTF).</p>	<p>in real-time with higher cost spinning reserves. This value ensures the cost of the imbalance reserve product does not exceed the operational value it provides. In response to stakeholder requests for further justification, the ISO held a final informational stakeholder call reviewing this change on May 2, 2023.</p>
<p>Congestion Revenue Rights Issues</p>	<p>Several stakeholders (CDWR, PG&amp;E, SDG&amp;E, Six Cities, WPTF) expressed the concern that the proposal will increase CRR shortfalls. By settling the cost of imbalance reserves through a cost allocation rather than a direct settlement with load and VERs using the locational marginal price of imbalance reserves, the ISO may not collect enough congestion revenues to cover the imbalance reserve marginal cost of congestion in the imbalance reserve deployment scenarios.</p>	<p>The revised final proposal includes a mechanism to collect congestion rent on imbalance reserve flows and redistribute it to entities entitled to the congestion revenue. This mechanism will involve calculating the "displaced" congestion revenue from imbalance reserve flows, collecting it through the existing imbalance reserve cost allocation, and redistributing it according to existing processes (e.g. through congestion revenue rights (CRRs) or to the EDAM BAA to distribute through their Open Access Transmission Tariff (OATT)).</p>
<p>Defining Imbalance Reserves as a "RUC Successor" Product</p>	<p>Due to RUC successor provisions in some contracts that require counterparties to amend contracts when new market products are created, several stakeholders (AES, CESA, Public Advocates Office, REV Renewables, Wellhead Electric Company) have requested clarity on whether the CAISO considers imbalance reserves to be a "RUC successor product".</p>	<p>Management has declined to participate in contract issues, and therefore does not define imbalance reserves as a RUC successor product. This issue could be viewed differently by contract parties. For instance, RUC was not designed to procure the uncertainty and intra hour ramping reliability needs that the imbalance reserve product is designed to meet. However, ISO operators have been committing additional resources through the RUC by biasing the RUC demand forecast to meet uncertainty and intra hour real-time ramping reliability needs. The evolving documents in this stakeholder initiative extensively described what the function and purpose of the new</p>



		products are, and do not provide further confirmation or denial as to the definition of the imbalance reserve relevant to existing contracts, as this inappropriately interprets contractual terms that the ISO is not a party to.
Potential duplicative payments for RA capacity	Stakeholders (California Community Choice Association (CalCCA), CPUC Public Advocates Office, Middle River Power, Vistra, WPTF) expressed concern that the introduction of Imbalance Reserve and Reliability Capacity products may lead to double payments for contracted resource adequacy resources. This is because the services these new products offer are already included in RA contracts through provisions like the must-offer obligation and RA contracts already account for costs related to these services.	The proposal cautiously avoids interfering with procurement contracts but acknowledges the need for additional information for settling revenues from new market products. The ISO will collaborate with parties during the DAME implementation to provide necessary information and facilitate contractual settlement provisions. The ISO will offer a breakdown of the imbalance reserve marginal price and introduce a three-year "opt-in" transitional resource adequacy true-up mechanism, allowing entities to choose how specific payments are handled. This mechanism will enable better coordination between load serving entities and generators for settling payments related to RA capacity.
Quantity of ramp associated with imbalance reserve awards	Concerns have been raised about the ISO's proposal to restrict imbalance reserves to a resource's 15-minute ramp capability (BANC, DMM, LADWP, NV Energy, PacifiCorp, PG&E, CPUC, and Seattle City Light). Stakeholders presented analysis that suggests forecast errors between day-ahead and real-time markets do not materialize solely within 15 minutes, but rather can occur over longer periods. Stakeholders were concerned that restricting the supply to 15-minute capacity may inflate the costs of imbalance reserve procurement, making it unnecessarily expensive.	In response to stakeholder concerns, the proposal expanded the imbalance reserve product to include the 30-minute ramp-capable portion of the resource.
Storage resource participation	Stakeholders expressed concern that the role of storage resources in the new market products was not well enough defined. There were also concerns that storage resources may not be able to maintain sufficient state of charge to honor	The revised final proposal includes three main changes/clarifications to storage resources modeling and participation in the day-ahead market. First, storage resources will be required



imbalance reserve and reliability capacity awards throughout the day. There were also concerns about the "envelope" constraints introduced to manage the state of charge for storage, as they may unnecessarily limit storage participation in the new market products (AES, CESA, REV Renewables).

to participate in the residual unit commitment process. Currently, schedules for storage resources from the integrated forward market are directly copied into the residual unit commitment market run. Second, this proposal confirms imbalance reserve up and down and reliability capacity up and down will be included in the equations that determine the state of charge for storage resources when awarded ancillary services. Finally, this proposal includes new requirements for the amount of state of charge that a storage resource must hold to support imbalance reserve awards in the day-ahead market. This includes anticipating upper and lower values (or an envelope) for state of charge to ensure that storage resources can deliver imbalance reserve awards in the real-time market, as failure to do so could have negative reliability implications. The potential negative effects on reliability require a cautious initial approach to storage participation in these products, which will be monitored and evaluated after gaining operational experience.

Stakeholder process and timing

Several stakeholders (BPA, Middle River Power, Powerex, Six Cities, The Energy Authority, WPTF) continued to request additional time to review elements of the proposal, particularly the changes made during the extended stakeholder process. These stakeholders have expressed that insufficient time has been dedicated to discussing changes added during the extended stakeholder process, and request that the ISO delay the taking the proposal to the Board of Governors and WEIM Governing Body for a decision until there have been further opportunities for input and the ISO provides additional justification for key proposed changes.

Management initially intended to bring the DAME final proposal to the Board of Governors and WEIM Governing Body for a decision in February 2023. In response to stakeholder concerns, Management initiated an extended stakeholder process to fully consider feedback and address remaining concerns. Management's proposal is the result of an extended stakeholder process that included five comprehensive stakeholder workshops, a draft revised final proposal, and two rounds of formal comments. In addition to the described extended stakeholder process, the ISO held an informational





		<p>meeting following the publication of the revised final proposal to provide stakeholders with additional justification and context for key proposal changes. Management recognizes that some stakeholders would appreciate the opportunity for continued discussion and additional justification and analysis of various elements of the proposal, and remains committed to continuing to work with stakeholders through the testing and implementation phases to clarify and refine these elements. However, it is not possible to further delay the Board of Governors and WEIM Governing Body decision without risking delaying the planned Fall 2024 implementation of EDAM.</p>
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