

## Price Formation Working Group Discussion – Phase 1

In the upcoming Price Formation Enhancements Working Group, we will be navigating through two complex yet essential topics, each characterized by a unique set of goals and issues. The preliminary list below is designed to help contextualize and lay out the scope and issues that have already been raised to date on these topics by both Stakeholders and CAISO. However, this list is by no means comprehensive or final. It serves as a starting point for discussion, allowing for the introduction of fresh perspectives and unanticipated matters that may arise as we delve deeper into working group discussions. We encourage Stakeholders to revisit and consider these ideas to empower your active participation in the working group sessions. The objective is to provide stakeholders ample time to gather their thoughts, shape perspectives, and, if desired, prepare any presentations they wish to deliver.

### Scarcity Pricing

What scarcity pricing enhancements are trying to achieve:

- Enhance the CAISO's pricing mechanisms under scarcity conditions with the following principles in mind:
  - Enable prices to accurately reflect the willingness of market participants to avoid involuntary demand curtailments
  - Enable prices to indicate that reserves are dwindling and approaching NERC-required minimum levels, and to reflect costs that operators may be incurring to maintain those reserves.
  - Ensure CAISO's scarcity pricing mechanisms allow market participants to transact in an equitable manner compared to non-market transactions in the broader Western interconnection.
  - Provide stronger incentives for market participants to perform and deliver in tight system conditions.

Potential problem statements scarcity enhancements could solve as identified by Stakeholders and CAISO:

- CAISO's energy bid caps and penalty prices may not provide appropriate incentives for market participants during tight system conditions.
- CAISO's ancillary service scarcity pricing might not be effective in setting scarcity prices.
- CAISO's bid cost recovery rules may not provide appropriate incentives for energy storage resources during tight system conditions.
- CAISO may need to reevaluate administrative pricing for energy and ancillary services during periods of curtailed demand.
- CAISO may need to reassess its 'no-pay' rules for ancillary services to ensure unavailable suppliers repay the replacement costs associated with procuring real-time ancillary services.
- Energy storage resource bids/DEBs are limited to a bid cap of \$1000/MWh, which may not reflect opportunity costs in tight system conditions when the bid cap is raised to \$2000/MWh.

- CAISO's market lacks a mechanism to reflect the dynamics of significant non-market demand response and strategic reserve resources in real-time price formation during tight system conditions.
- CAISO's market does not currently have a "circuit breaker" mechanism in the event scarcity pricing occurs for an extended period of time.

## BAA-Level Market Power Mitigation

What BAA-level market power mitigation is trying to achieve:

- Determine whether to apply BAA-level market power mitigation, as done in the WEIM today, to the EDAM
  - BAA-level market power mitigation utilizes a dynamic competitive path assessment (DCPA) to evaluate if the available generation in a WEIM BAA can competitively meet the demand without additional WEIM transfer imports. If the DCPA detects non-competitive conditions, all WEIM participating resource bids in that BAA are subject to mitigation. This process is intended to prevent potential market power abuse and ensure competitive prices.
- Consider enhancements to CAISO's methodology for applying BAA-level market power mitigation.
- Determine whether the CAISO BAA should be included in BAA-level market power mitigation that applies to the EDAM, WEIM, or both.

Potential issues identified by CAISO and stakeholders:

- The current dynamic competitive path assessment only considers constraints within the same balancing authority area, which may not reflect the true scope of a resource's impact. There is an opportunity to improve the DCPA by considering all constraints impacted by a resource, not just those within the same balancing authority area.
- Market power mitigation measures are applied independently for each balancing authority area, not considering the competitive supply across a group of areas. Market power mitigation could be made more accurate and efficient by grouping balancing authority areas together when performing the DCPA.
- The grouping methodology may need evaluation. For example, assuming all BAAs are competitive if the one with the highest power balance constraint shadow price is deemed competitive may lead to gaps in detecting and mitigating market power.
- The composition of the Residual Supply Index (RSI) may need evaluation. For example, assuming non-transfer exports as load when determining an entity's supply included in the RSI may lead to gaps in detecting and mitigating market power.
- CAISO BAA's inclusion in the grouping method for market power assessment and mitigation may need evaluation.
- Alternative grouping methodologies may need consideration. For example, instead of grouping BAAs from the highest to the lowest-priced power balance constraints, CAISO may group BAAs from the lowest to the highest, iteratively testing all BAAs together for market power with the

lowest-priced BAAs removed after each round, until the highest-priced group is tested. Other alternatives may provide better balance between computational complexity and accuracy of the algorithm.

- The conduct-and-impact framework used in numerous other ISOs/RTOs could be considered as part of the BAA-level market power mitigation mechanism.
- The application of BAA-level market power mitigation applies to BAAs that fail the Resource Sufficiency Evaluation (RSE) should be considered.

## In Conclusion

As we move forward, we request stakeholders to:

- Review the issues and principles outlined in this document.
- Consider if new issues and principles should be incorporated into the discussion.
- Reflect on how these issues impact your operations and what solutions you envisage.
- Prepare to share your insights, concerns, and suggestions during the working group sessions.
- If possible, prepare presentations to share your perspectives and potential solutions in a structured way.

This working group provides an opportunity for stakeholders to engage and contribute to this critical conversation. We look forward to a productive discussion, where we can collectively shape and influence the future of price formation in CAISO's markets.