California ISO

Price Formation Enhancements

Market Surveillance Committee General Session

January 16, 2026

Price Formation Enhancements

BAA-LEVEL MARKET POWER MITIGATION

Market Power Mitigation in EDAM

- EDAM policy extended the WEIM's MPM framework to EDAM.
  - Local market power mitigation (LMPM) addresses market power issues that arise from congestion within BAAs.
  - BAA-level market power mitigation (BAAMPM) addresses market power issues that arise from congestion between BAAs (EDAM/WEIM transfers).
- CAISO and stakeholders found the existing BAAMPM design outdated.
- EDAM policy deferred BAAMPM design improvements to the Price Formation Enhancements initiative.

2022 Issue Paper

- Current test evaluates each BAA in isolation when import transfer constrained from the CAISO.
  - CAISO BA MEC is the competitive reference price

- The test limits the identification of potentially pivotal suppliers to those within the tested BAA. That could cause “false positives” because those suppliers may be competing across a broader unconstrained WEIM region.

- The ISO proposed a “grouping" approach that tests BAAs with similar prices and transfer capability together.

2024 Discussion Paper

- Scope expanded to:
  - Consider testing the CAISO BAA, which is currently assumed competitive by default.
  - Consider mitigating only pivotal suppliers rather than all suppliers in a failed BAA.
  - Consider an “impact test” that mitigates only when bids raise prices above a defined threshold.

Data Analysis and MSC Discussion (early 2025)

- Initial analysis suggested grouping would reduce mitigation, but when the ISO reanalyzed with the CAISO BA included, the results showed that CAISO BA frequently failed the competitiveness test, especially on summer evenings, and other BAAs' pass rates dropped sharply along with it.

- MSC suggested results driven by flaw in the test, which assumes load-serving entities would withhold all available capacity. The MSC argued it would be economically irrational to withhold supply needed for its own load because it would then have to procure that energy at the inflated price it helped create.

- MSC urged CAISO to consider two improvements:
  - Consider retail load obligations when calculating withholdable capacity.
  - Mitigate only 'net pivotal' suppliers — those with both the ability and incentive to withhold.

August 2025 Straw Proposal

- The 2025 straw proposal incorporated MSC feedback to fix issues the data analysis exposed.

- The ISO proposed:
  - A formal grouping algorithm that includes the CAISO BA.
  - To consider affiliate “load-serving obligations (LSO)” when calculating its withholdable capacity.
  - To mitigate only pivotal suppliers rather than all suppliers in a failed group.

Price Formation Enhancements

CALCULATING LOAD-SERVING OBLIGATIONS (LSO)

Integrating LSO into the BAAMPM Test

- Before LSO:
  - Withheld capacity (WC)

$$WC = S_{max} - S_{min}$$

  - Residual Supply Index (RSI)

$$RSI_{BAA} = \frac{Supply}{Demand} = \frac{\sum_{i \in FCS} S_{i,max} + Imp + \sum_{j \in PPS} S_{j,min}}{Load + Exp}$$

- After LSO:
  - Withheld capacity (WC)

$$WC = \max\{0, S_{max} - \max\{S_{min}, LSO\}\}$$

  - Residual Supply Index (RSI)

$$\sum_{j \in PPS} S_{j,min} \Rightarrow \sum_{j \in PPS} \min\{S_{j,max}, \max\{S_{j,min}, LSO_j\}\}$$

August 2025 Straw Proposal

- The ISO proposed a conceptual methodology to prompt discussion:
  - The ISO would create a set of “LSO profiles” for each affiliate using historical metered data broken down by hour, season, and day-type.

- The proposal self-identified its limitations (confirmed by stakeholders):
  - It ignores real-time conditions. Averages will underestimate LSO during heatwaves (overstating a supplier’s incentive to withhold) and overestimate LSO on mild days.
  - It fails to capture recent load growth or migration.
  - Due to settlement timelines, the ISO might have to wait until April to use the previous year's data effectively.

DAM LSO

- In the DAM, the clearest measure of what you must serve tomorrow is what you actually scheduled and cleared in the DAM.

DAM LSO = cleared scheduled load + net virtual demand?

- Summed across all SCs in the affiliate group. Values taken from the MPM pass.

- Should we include net virtual demand? Incentives may align because it is part of the affiliate's cleared DAM "buy-side position" and is fungible with load. However, DAM load bids and virtual demand bids differ in granularity, affiliates may offer virtual demand for unrelated financial reasons, and may give LSO credit to affiliates with no actual retail load.

RTM LSO (simple case: one affiliate)

- In the RTM, the clearest measure of what load exists right now is the BAA real-time demand forecast.

RTM LSO = BAA real-time demand forecast for that interval

- If there is only one affiliate, the whole BAA forecast is their load obligation.

RTM LSO (multiple affiliates and in EDAM)

- Now we must split the BAA forecast among affiliates. LSEs within an EDAM BA that bid separately must also meter separately.

RTM LSO = (BAA real-time demand forecast) x (Affiliate's historical % share)

Where "historical % share" is computed by hour, day-type, and season using the previous calendar year's metered data.

RTM LSO (multiple affiliates and not in EDAM)

- For WEIM-only multi-affiliate BAAs, we may not have the metering data needed to allocate based on historical metered load share.

- We are considering two workarounds:
  1. If affiliate-level load metering exists (or can be made available), use the same metered load-share approach.
  2. If affiliate-level load metering does not exist:
     - Set merchant affiliates LSO = 0?
     - Allocate LSO only to LSE affiliates using "supply share". Define supply share as: affiliate's total maximum available capacity from resources inside the BAA ÷ total maximum available capacity of all resources inside the BAA, updated annually.

     LSO = (affiliate supply share %) x (BAA real-time demand forecast)
     - If merchant LSO = 0, do we reallocate their supply share to the LSEs (normalize to 100%)?

Example

- Forecast 1000 MW; supply shares: LSE1 80%, LSE2 15%, Merchant 5% ⇒
  - LSE1 LSO 800 MW
  - LSE2 LSO 150 MW
  - Merchant 0 MW
  - 50 MW unallocated

- OR
  - LSE1 LSO 842 MW | (80/95%) of 1000MW
  - LSE2 LSO 158 MW | (15/95%) of 1000MW
  - Merchant 0 MW
  - 0 MW unallocated

Price Formation Enhancements

SCARCITY PRICING

Core Problem Statements

- The market lacks mechanisms that gradually increase energy and reserve prices ahead of shortages. Today's mechanisms are reactive and leave too little time for market participants to respond and can create volatile price swings.

- Administrative penalty prices are anchored/scaled to the bid cap and may be out-of-date, so they may not reflect the "true" value of reliability/scarcity or keep pace with tighter supply and inflation. This potentially weakens incentives to offer into CAISO during scarcity.

- Scarcity pricing does not apply consistently across the regional footprint, which can create inconsistent outcomes.

August 2025 Straw Proposal

- CAISO deferred a comprehensive footprint-wide scarcity pricing redesign.
  - Implementing a new reserve product was not a popular option in the working group.
  - Extending FRP for this purpose may be premature before ongoing FRP performance and design work is complete (including interactions with imbalance reserves).
  - Using AS for this purpose would require a comprehensive redesign of AS procurement including extension to the EDAM/WEIM footprint.
  - CAISO recognized some stakeholders suggested an energy supply margin approach as a more direct path, which it initially dismissed but later reconsidered.

- CAISO proposed more incremental improvements instead:
  - Ensure scarcity prices when operators shed load
  - Enhance scarcity pricing when operators “arm load”

October 2025 WEM Governing Body (general session) meeting

- CAISO staff gave the Governing Body a “foundational knowledge” briefing on scarcity pricing theory and its place in the PFE initiative.
  - On scarcity pricing, staff highlighted near-term items discussed in the straw and noted that a comprehensive scarcity pricing design would be explored with stakeholders in the working group.
- Vitol presented to the Governing Body on price formation and scarcity pricing.
  - Vitol advocated for enhanced scarcity pricing in real-time and day-ahead markets to make prices rise more gradually and send earlier scarcity signals.
- The Governing Body received stakeholder public comment letters urging opposite directions on “comprehensive scarcity pricing” timing and scope
  - WPTF urged the Governing Body to direct CAISO to fully develop a robust scarcity pricing design.
  - Joint CA LSEs urged the Governing Body to hold off on comprehensive scarcity pricing revisions.

November 10 and 20 Working Group Sessions

CAISO Presentation:

CAISO presented a plan to split the initiative into two parallel tracks:

- **Track 1:** Continue with BAA-level MPM and the limited scarcity pricing enhancements from the straw proposal.
- **Track 2:** Resume working group discussions on comprehensive scarcity pricing to eventually combine with Track 1 for a joint governance decision.

Stakeholder Presentations:

- **Joint LSEs (SCE on behalf of IOUs, POUs, and Six Cities):** Opposed Track 2. They said EDAM/DAME changes the market too much to add scarcity pricing reforms now.
- **WPTF (Gridwell Consulting):** Presented an energy supply margin (ESM) framework. They said CAISO could implement ESM faster than a new reserve product and use it to signal tightening supply before emergency conditions occur.

Key Technical Discussions (led by CAISO):

- CAISO contrasted a **Reserve + ORDC** approach with an **ESM** approach. The two approaches could produce similar outcomes but would differ in how CAISO implements them.
- CAISO framed some major design questions.

Summary of Written Comments (Submitted Dec 12)

Camp A

- It is premature to design comprehensive scarcity pricing while EDAM/DAME are still being implemented and their real-world impacts are not yet understood.
- Recent storage additions and the RA program reduce the missing-money concern. Scarcity pricing is a cost to ratepayers without guaranteed reliability benefits.
- Recommend CAISO finalize the straw proposal (Track 1) and pause Track 2 until CAISO can review post-EDAM market performance.

Camp B

- CAISO's lack of a sufficient scarcity pricing design undermines reliability and efficient price formation.
- CAISO should not expand BAA-level MPM to the CAISO without adding scarcity pricing.
- Many support the ESM concept for adding scarcity signals.