



California ISO

Price Formation Enhancements Phase 2

Stakeholder Meeting

Day 2: Scarcity Pricing

Price Formation Enhancements: BAA-Level MPM and Scarcity Pricing Revised Straw Proposal

July 14, 2026

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Where are we in the process?



Day 2 agenda and timing

Time	Block	Purpose
:00-:25	Opening, recap, and scarcity	Link Day 1 to Day 2 and define scarcity pricing scope
:25-1:20	Load shed pricing	Explain triggers, FMM/RTD scope, safeguards, and circuit breaker
1:20-2:05	Armed reserve pricing	Explain RTPD/RTD issue, armed load and reserves, and an example
2:05-2:25	Deferred issues	Administrative emergency actions and comprehensive scarcity pricing
2:25-2:30	Close	Summarize needed feedback and next steps

Day 2 meeting goals

Explain the revisions

What changed from the straw proposal and why

Walk through the mechanics

Armed reserved pricing, load shed pricing

Target feedback

Where written comments should focus before the draft final proposal

- Preserve time for questions after the technical sections
- Use examples to show how the proposals work
- Separate current items from future issues

Two-day roadmap



Ready to advance

Targeted BAAMPM reforms and scarcity pricing updates

Needs feedback

Implementation choices, safeguards, data inputs, and tradeoffs

Future phase

BAAMPM for CAISO and comprehensive scarcity pricing

RSP decision framework

Reduce over-mitigation

Account for neighboring BAA competition, load obligations, and truly pivotal suppliers

Preserve price signals

Do not suppress legitimate prices when supply is tight and the market needs resources

Defer unresolved issues

Do not expand BAAMP to CAISO or adopt comprehensive scarcity pricing in this proposal

Stakeholder feedback

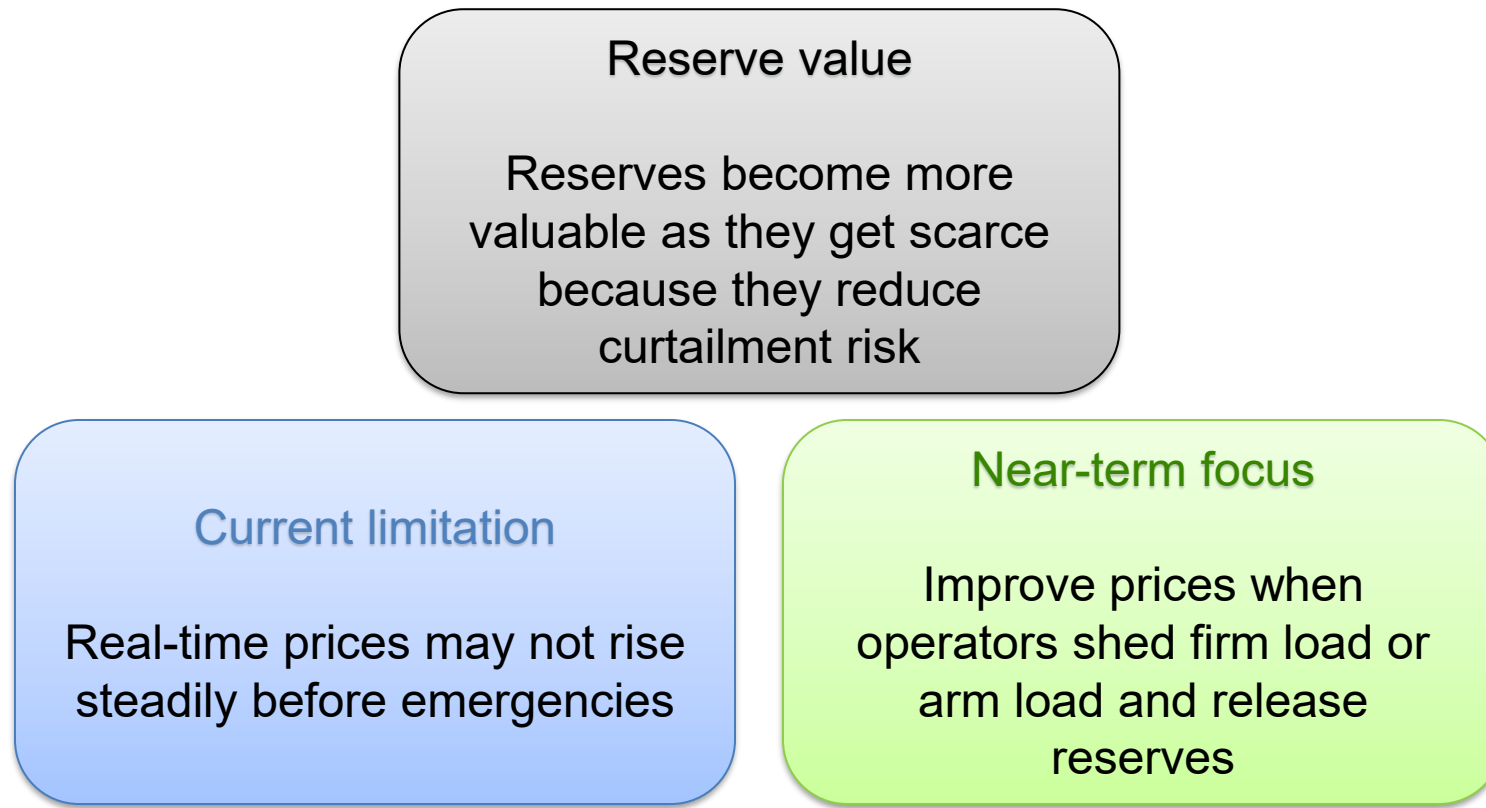
When	Forum	What changed
Sep 2025	Straw proposal meetings	Changes to grouping, CAISO BAA, LSO, pivotal suppliers, and scarcity pricing timing
Oct-Nov 2025	WEM GB spotlight #1 and scarcity pricing working groups	Two-track plan – near-term package plus broader scarcity pricing work
Jan 2026	MSC discussion	Updated BAAMPM analysis and input on mitigation and scarcity pricing
Mar 2026	WEM GB spotlight #2	Stakeholder differed on when to do comprehensive scarcity pricing

Stakeholder feedback directly changed the RSP scope, sequence, and technical design.

Price Formation Enhancements Revised Straw Proposal

CHANGES TO SCARCITY PRICING

Scarcity pricing problems



- The RSP does not propose a comprehensive scarcity pricing redesign
- The targeted proposals improve pricing during severe system stress under today's market structure

How stakeholder feedback shaped the proposals

Feedback	RSP change	Where it appears
Load shed pricing should affect real-time dispatch	Adopt an in-market approach rather than a settlement-only rule	Load shed pricing
RTD-only design would miss FMM-settled imports and transfers	Extend the load shed pricing mechanism to both RTD and FMM	Load shed pricing
Operational and credit risks need safeguards	Allow operators to pause the mechanism and keep a financial circuit breaker	Load shed pricing
Clarify armed reserve terminology and add examples	Define armed load vs. armed reserves and add a numerical example	Armed reserve pricing
Comprehensive scarcity pricing design remains disputed	Defer comprehensive redesign to future effort	Comprehensive scarcity pricing

Load shedding can make market demand look lower

Emergency

- BA operator orders firm load shedding

Metered load drops

- Disconnected firm load lowers observed load

Forecast follows

- Persistence forecast may lower the market demand input

Weak price signal

- Market may treat unserved load as lower demand

Prices may fall

- Scarcity prices may disappear while load is still curtailed

The market should not treat emergency curtailment as lower demand.

RSP treats firm load shed as unserved demand

Trigger

BAA is in EEA Level 3 and the BAA operator has an active firm load shed instruction

Market scope

Apply in RTD and FMM to preserve price signals

Pricing logic

If supply cannot meet adjusted demand, the power balance constraint binds at the penalty price

- FMM treatment matters for WEIM transfers and CAISO intertie resources that can respond to scarcity
- Mechanism extends to all WEIM BAAs
- Scarcity prices may reach neighboring BAAs when transfer paths are uncongested and can support the shedding BAA

Implementation options under review

Option	How it works
Add verified load shed	Add verified firm load shed MW to the applicable market demand input
Use a non-persistence forecast	Switch to a standard weather-based forecast during load shedding

- What quantity best represents unserved firm load without overstating the shortfall?
- Which option works best during an emergency?

FMM and RTD timing tradeoff

FMM run	Active instruction?	RTD run	Risk	RSP tradeoff
Prices a future 15-minute interval about 37.5 minutes ahead	The ISO may not know whether load shedding will be active then	Solves closer to real time	The instruction could change between FMM and RTD	Preserve the FMM scarcity signal during active load shedding

Operational and settlement safeguards

Operator authority

Suspend or reduce the mechanism to preserve reliability, manage ACE, or avoid infeasible dispatch

Settlement monitoring

Monitor real-time energy imbalance offsets as the system enters or exits load shedding

Circuit breaker

Turn off the mechanism for a BAA after four cumulative hours of load shed conditions in a rolling 24-hour period

- The tradeoff is to sustain a scarcity pricing signal without creating open-ended credit and settlement exposure during prolonged outages.

Why RTD can lose the scarcity signal

Market process	What it does	Pricing impact
RTPD / 15-minute process	When it procures incremental AS, it compares energy vs. AS value and can price reserve shortages through SRDC	Can reflect the opportunity cost of using limited capacity for energy instead of AS
RTD / 5-minute process	Dispatches energy only; does not re-procure or re-optimize AS	May dispatch armed reserve capacity as energy without reflecting reserve opportunity cost

RTD should preserve the scarcity value that RTPD reflects when reserves are scarce.

Armed load vs. armed reserves

Armed load

Firm load designated by operators as available for immediate controlled disconnection

Armed reserves

Generation capacity held as contingency reserves and then released into the market

- The purpose of this proposal is to reflect the opportunity cost of using reserve capability released only because operators armed load
- Arming load does not create new physical generation capacity

RSP adds opportunity cost logic to RTD

Operators arm load	Reserve capacity is released	RTD variable	Penalty value	Price signal
Firm load becomes a contingency reserve substitute	Previously awarded AS capacity becomes available for energy	Track how much armed reserve capacity is dispatched as energy	Apply a single reserve slack penalty based on SRDC values	RTD LMP reflects energy bid plus reserve opportunity cost

- RSP uses one reserve slack penalty instead of a three-tier curve.

Armed reserve pricing example

Condition	Value
Resource A max output	100 MW
Current energy output	50 MW
Spinning reserve award released after load is armed	50 MW
Prevailing energy bid cap / released energy bid	\$2,000/MWh
Reserve slack penalty at \$2k cap	\$700/MWh
Illustrative RTD price if 1 MW of released reserve is dispatched	$\$2000 + \$700 = \$2700/\text{MWh}$

The higher price reflects capacity held for contingencies, not just ordinary energy.

RSP does not extend this mechanism to WEIM BAAs

Current limitation

- WEIM BAAs do not have the same market-procured AS framework

Interim design risk

- A bespoke WEIM mechanism could add complexity, create inconsistencies, and become obsolete

Roadmap

- Address this issue in broader integrated AS procurement and scarcity pricing work

Deferred issue: administrative pricing for emergency actions

Issue

Out-of-market actions can add supply or reduce demand outside optimization and suppress prices

Why not now?

Emergency programs and operator actions differ across BAAs

Longer-term path

A future ORDC, energy supply margin, or similar framework could price scarcity using real-time conditions

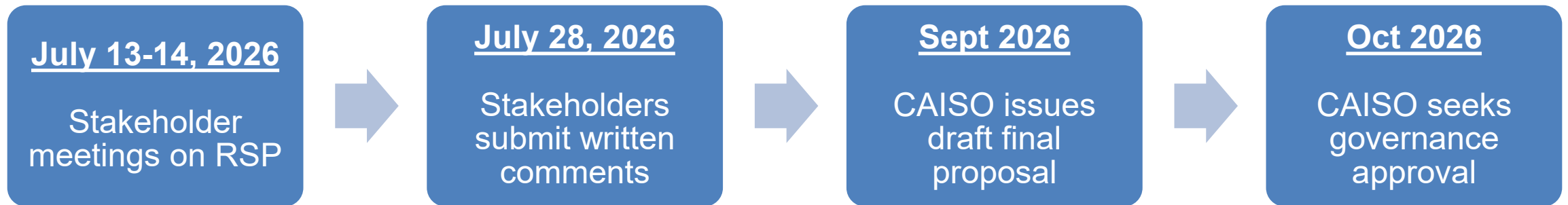
- The RSP treats firm load shedding as a clear and severe emergency action used consistently across WEIM BAAs.

Deferred issue: comprehensive scarcity pricing

Perspective	Arguments reflected in the RSP
Act sooner	Scarcity prices should rise before emergencies; weak signals may discourage supply, imports, and demand response / flexibility
Wait / limit near-term changes	EDAM/DAME are major market changes; comprehensive scarcity pricing could increase costs

- The RSP advances targeted changes now. PFE working group discussions will resume after the governance decision for these changes.

Next steps and governance



Price Formation Enhancements Revised Straw Proposal

APPENDIX SLIDES

Appendix: current scarcity pricing mechanisms

Mechanism	Current role
Scarcity reserve demand curve (SRDC)	Applies in CAISO BAA when CAISO cannot meet ancillary service requirements
FRP / imbalance reserve demand curves	Let the market trade off the cost of procuring flexible ramping or imbalance reserves
Administrative penalty prices	Apply when constraints must be relaxed to achieve feasible dispatch
Emergency pricing rules	Set rules for released reserves and reliability demand response resource bids
WEIM assistance energy transfer surcharge	Raises the cost of relying on external energy or flexibility after RSE failures and assistance transfers

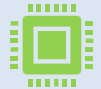
Next Steps



Comments due July 28, 2026, via ISO Commenting Tool



Publish Draft Final Proposal with Stakeholder Meeting *Please note that the dates above are tentative until the CAISO publishes a notice formally confirming them*



[Price formation enhancements phase 2](#)



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