



Price Formation Enhancements

Working Group Session #11

Sprint 2

1/17/2023

Housekeeping reminders

- This call is being recorded for informational and convenience purposes only. Any related transcriptions should not be reprinted without ISO's permission.
- These collaborative working groups are intended to stimulate open dialogue and engage different perspectives.
- Please keep comments professional and respectful.
- Note: The ISO encourages any verbal or written agreements to comments made during this working group session.
- You may also send your question via chat to either Isabella Nicosia or to all panelists.

Recent changes to the Intellor platform, specifically around audio while joining meetings

- The “call me” feature is no longer being offered when joining Operator assisted meetings.
 - You must chose between Computer Audio option and a Dial-In audio options.
 - Dial In options (including your Attendee ID#) will be provided in the meeting details upon registration
 - This attendee ID is unique to your registration
- We are actively working with Intellor on alternatives options and appreciate your patience. I will provide and update at the beginning of the year.

Instructions for WebEx

- The “raise hand” icon is located in the lower tool bar. You will hear a beep tone when you are un-muted; at that time please state your name, and question. Attendees dialed in on the phone only press #2 will hear a notification when you are un-muted; at that time please state your name and question. 
- WebEx platform will **LOCK** and mute you if you mute yourself once you have finished your question. Do not mute yourself until you have completed your question or comment.

Today's Working Group Agenda

Time	Topic	Presenter
9:00 – 9:05 AM	Welcome, Today's Agenda	Isabella Nicosia
9:05 – 9:10 AM	Today's Goals / Next Sessions	Juan Buitrago
9:10 – 10:45 AM	Sprint 2 – Scarcity Pricing Problem Statement	James Friedrich
10:15 – 10:45 AM	Stakeholder Discussion : Scarcity Pricing	Juan Buitrago
10:45 – 11:00 AM	Next Steps	Brenda Corona

Goals of Today's Working Group Session

The Working Group structure is meant to embrace flexibility to allow organic and robust conversation on the topics at hand – it is still key for us to drive towards solutions collaboratively

- **Return the Working Group conversation to Scarcity Pricing**
 - Briefly Review concepts around the Scarcity Reserve Demand Curve, root causes, and topics for discussion to refine issue identification
- **Stakeholder Discussion on Problem Statement**
 - Receive stakeholder feedback on issue identification and appropriate framing of issue identified
 - Receive feedback on potential solutions from Stakeholder community
 - Receive feedback on necessary considerations for solutioning

ISO Policy Initiative Stakeholder Process



Stakeholder meetings, working groups and workshops may occur throughout the stakeholder process.

We are here

- Working groups will inform the Phase 1 straw proposal
- The ISO will take notes and produce reports of each of our working group meetings.



Price Formation Enhancements

Working Group Session – Scarcity Pricing Sprint #2
Staff Presentation

January 17, 2024

Review: What we covered last week

- Scarcity pricing occurs when the market enables prices to rise above the highest offer price of an available resource due to a shortfall in meeting demand.
- CAISO uses a Scarcity Reserve Demand Curve (SRDC) during periods of supply shortfalls to clear the ancillary services market using administratively determined penalty prices.
 - This mechanism aims to increase supply and decrease demand

Review: What we covered last week

- The discussion reflected on CAISO's market design features that limit activation of the SRDC under tight system conditions and considered improvements such as a stronger deliverability test for ancillary service procurement to enable complete re-optimization of ancillary services in the real-time market.
- Last week, we discussed the market's response to actual shortages. This week, we'll explore actions the market should take before a shortage occurs.

Reserve shortage pricing in ISO/RTO markets

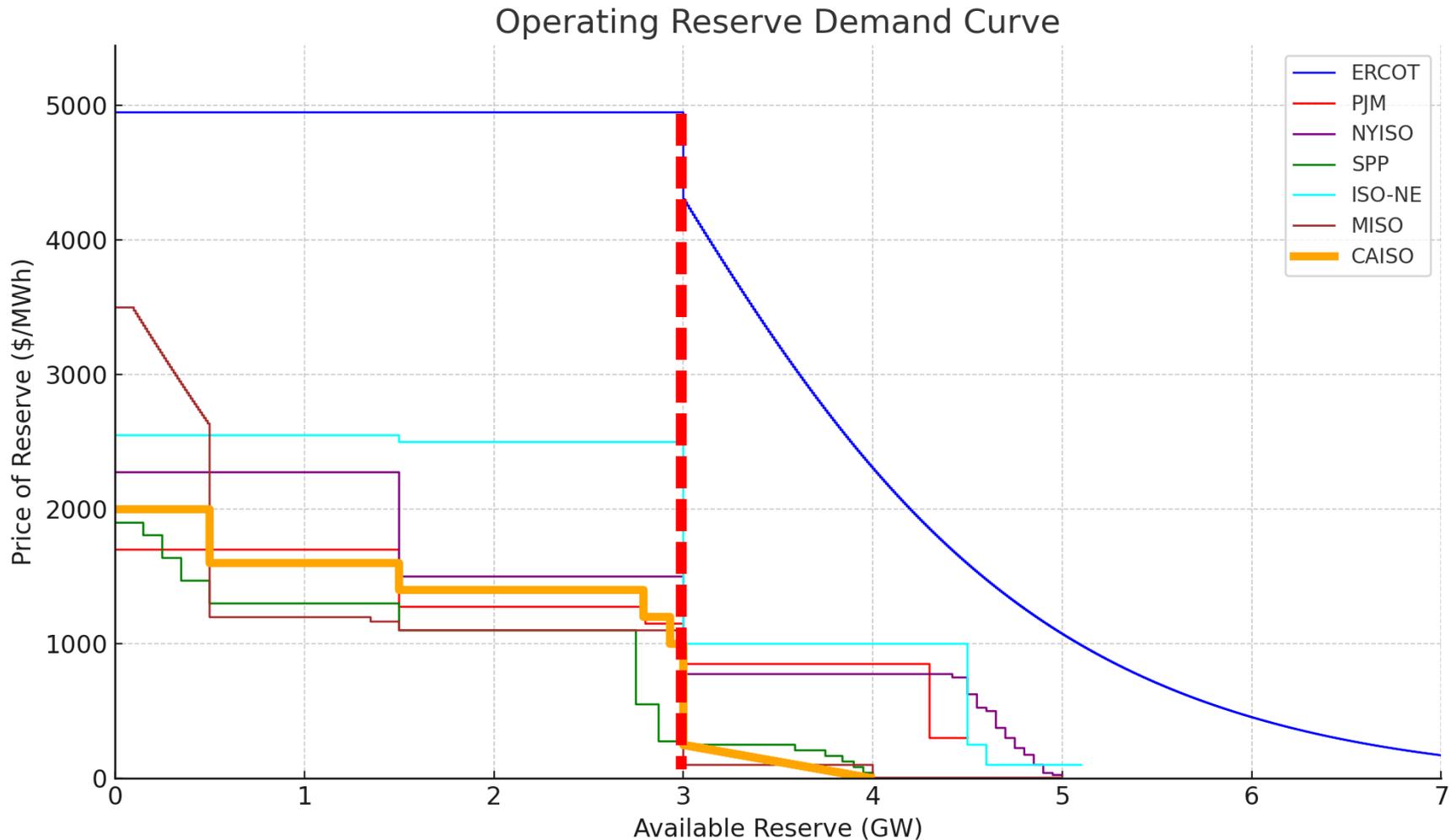


Chart adapted from Mehrtash, Mahdi, Benjamin F. Hobbs, and Erik Ela. "Reserve and energy scarcity pricing in United States power markets: A comparative review of principles and practices." *Renewable and Sustainable Energy Reviews* (2023)

Problem Statement

CAISO's market design limits the opportunity for energy prices to gradually rise ahead of impending demand shortfalls.

Why is that a problem?

- Insufficient time for market participants to respond and resolve impending demand shortfalls. Increased risk of reliability events.
- Greater frequency of large and sudden energy price spikes. Increases risk and creates confusing price signals for market participants.
- System operators are otherwise taking actions that may not be reflected in market prices

Preliminary options for discussion

- Extend the procurement curve of our non-required NERC reserve (FRP)
- Extend the procurement curve of our required NERC reserves (spin/non-spin) in excess of the NERC requirement
- Implement a latent-supply based ORDC or some other new reserve product

What's to the right of the dashed line?

ISO/RTO	Product
CAISO	Flexible Ramp Product
ERCOT	Spinning Reserve 30-minute Reserve
ISO-NE	30-minute Reserve (System, Local, and Replacement)
MISO	30-minute Reserve Flexible Ramp Product
NYISO	10-minute Reserves (Spin and Non-Spin) 30-minute Reserve
PJM	Spinning Reserves Primary Reserves (Spin + Non-Spin)
SPP	Flexible Ramp Product

EPRI - Comparison of Flexibility Reserves and Operating Reserve Demand Curves (October 2023)

Table ES-1
Comparison of implementation features for flexible reserve and ORDC

	Flexible Reserve	Operational Reserve Demand Curve
Pros	<ul style="list-style-type: none"> Increases operating reserves to increase system flexibility Allows tailoring of reserve parameters to required flexibility needs Allows different resources to provide the reserve Can vary requirements often to avoid over- or under-procurement 	<ul style="list-style-type: none"> Increases operating reserves to increase system flexibility No need to design new reserve product No need to certify generators to provide reserve Can vary requirements often to avoid over- or under- procurement
Cons	<ul style="list-style-type: none"> Need to certify resources for providing flexible reserve Need to design a new product Generator ramp sharing between reserve products may be a concern Increased computational complexity may slow market clearing 	<ul style="list-style-type: none"> Existing reserve design is not tailored to flexibility needs Only allows same resources to provide flexibility that provide existing reserve May not be available if reserve is limited to contingency events only Demand curves are more difficult to tune



California ISO

Stakeholder Feedback

Next steps

PFE Working Group Sprint #3

- Wednesday January, 24th, 2023, virtual
- Feedback on today's problem statement/potential solution conversation
- Continue conversation on Scarcity Pricing Problem statements

Next steps

Upcoming PFE Working Group Sessions

- January 2024 – Scarcity Pricing
- Jan 17- Virtual 9-11am
- **Jan 24 – Virtual 9-12pm**



Meeting
 Holiday Office Closed

Please note the working group session is tentative until confirmed through a notice in the ISO's Daily Briefing

Price Formation Enhancements Working Group Tentative Schedule

January						
Su	Mo	Tu	We	Th	Fr	Sa
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

- Jan 10, 2024 – Working Group – Scarcity Pricing
- Jan 15, 2024 - *Holiday Office Closed*
- Jan 17, 2024 – Working Group – Scarcity Pricing
- Jan 24, 2024 – Working Group – Scarcity Pricing

February						
Su	Mo	Tu	We	Th	Fr	Sa
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29		

- Feb 12, 2024 – Working Group – Fast Start Pricing
- Feb 19, 2024 – *Holiday Office Closed*
- Feb 26, 2024 – Working Group – BAA Level Market Power Mitigation (MPM)

- <http://www.caiso.com/InitiativeDocuments/Price-Formation-Enhancements-Working-Group-Schedule-2024.pdf>

For reference

- Visit Price Formation Enhancements Working Group initiative webpage for more information:
<https://stakeholdercenter.caiso.com/StakeholderInitiatives/Price-formation-enhancements>
- Price Formation Working Group Schedule
<http://www.caiso.com/InitiativeDocuments/Price-Formation-Enhancements-Working-Group-Schedule-2024.pdf>
- If you have any questions, please contact Brenda Corona at bcorona@caiso.com or isostakeholderaffairs@caiso.com

NEWS RELEASE: FERC accepts ISO tariff changes for a Western day-ahead electricity market

- New rules adopted for the Day-Ahead Market Enhancements (DAME) and the Extended Day-Ahead Market (EDAM).
- Stakeholders were deeply engaged in designing the market rules through a collaborative working group process, which included regional utilities, independent energy providers, state regulators, public interest organizations, and a variety of entities representing various interests and points of view throughout the Western Interconnection.
- Learn more about EDAM through this [link](#).
- Find out [What They're Saying](#), [News Release](#)



- *Energy Matters* blog provides timely insights into ISO grid and market operations as well as other industry-related news

<http://www.caiso.com/about/Pages/Blog/default.aspx>.

December 18, 2023
Leadership, Western EIM

WEIM Governing Body has two positions to fill in 2024

By Nicole Hughes

In 2024, the Western Energy Imbalance Market (WEIM) Nominating Committee will reconvene and lead the stakeholder effort to recommend candidates to fill two positions on the WEIM Governing Body that are set to expire at the end of June. This time around, there is the added consideration of candidates' qualifications to meet the additional ...

[READ MORE](#)

The article preview includes a large image on the left with the text "WESTERN ENERGY IMBALANCE MARKET" and "WEIM" in large, white, block letters over a blue background with a faint grid pattern.

December 11, 2023
Leadership

California ISO 2023 Year in Review

Last year, following extensive engagement with our partners and stakeholders, the California ISO published its 2022-2026 Strategic ...

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The article preview includes a large image on the left showing a modern building at night with the text "CALIFORNIA ISO 2023 YEAR IN REVIEW" overlaid in white.

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