



California ISO

Price Formation Enhancements

Working Group Session #1

08/03/2023

Housekeeping reminders

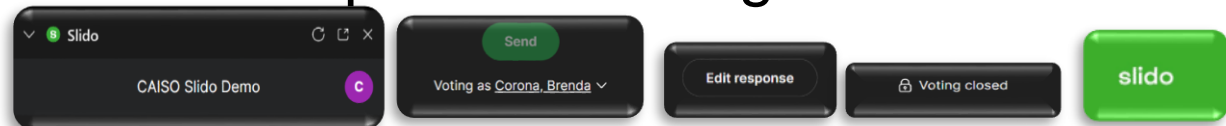
- This call is being recorded for informational and convenience purposes only. Any related transcriptions should not be reprinted without ISO's permission.
- These collaborative working groups are intended to stimulate open dialogue and engage different perspectives.
- Please keep comments professional 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 Brenda Corona or to all panelists.

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.
- Polling App: *Slido* you can select the answer to the question.
- Virtual Attendees will see questions on right screen above the chat window.



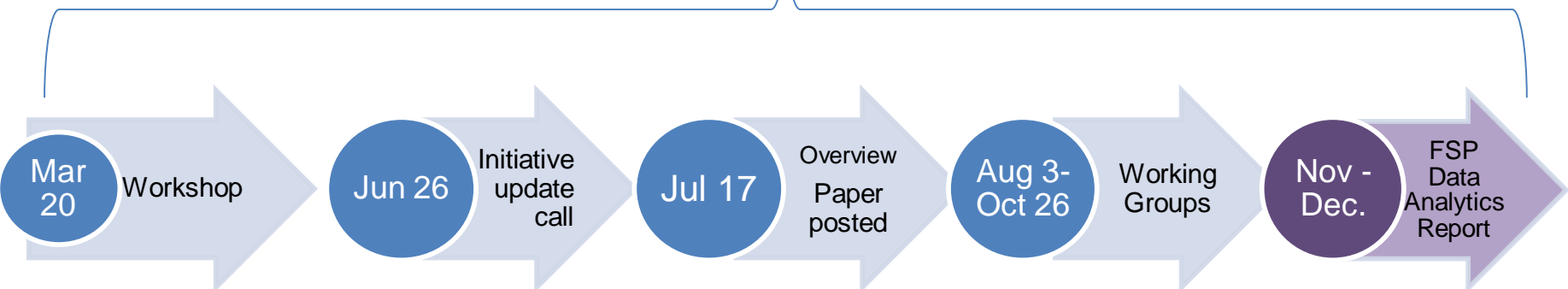
- In-Person Attendees will use the passcode to login from a device to answer questions

Today's Working Group Agenda

Time	Topic	Presenter
9:00 – 9:10	Welcome, Slido Polling Overview, Today's Agenda, Stakeholder Process Overview	Brenda Corona
9:10 – 9:20	Working Group Deliverables	Juan Buitrago
9:20 – 10:10	Overview of Issue Paper	James Friedrich
10:10 – 10:55	Guiding Principles and Problem Statements – Open Discussion	Juan Buitrago
10:55 – 11:00	Next steps	Brenda Corona

Pre-Development Phase: PFE Approach

Stakeholder Input



2023

2024

Scarcity Pricing

BAA-Level Mitigation

Fast Start Pricing (Part of Phase 1 & 2)

Phase 1

ISO Policy Initiative Stakeholder Process



This represents the typical process, and often stages of the process run in parallel.

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

We are here

- Working groups will inform the Phase 1 straw proposal and development of a *Fast Start Pricing Analytics Report*
- The ISO will take notes and produce reports of each of our working group meetings.



Price Formation Enhancements

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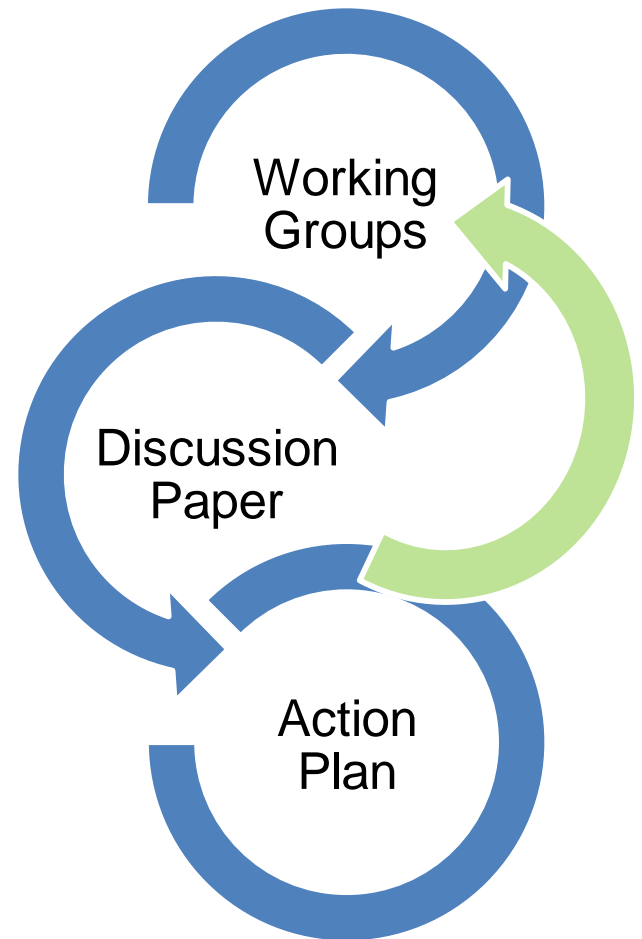
Juan Buitrago, Account Manager, Stakeholder Engagement
08/03/2023

Working Group Deliverables

Action Plan: A bridge between the working groups and a straw proposal, the Action Plan will inform the policy direction for Price Formation Enhancements Phase 2 stakeholder initiative.

The action plan will recap all perspectives shared in the working group process and identify the policy direction/basis of the straw proposal

You will have an opportunity to provide written comment on the Action Plan



Goals of the Price Formation Enhancements Working Groups

Stakeholders have the opportunity to provide input on key components leading up to proposal development--

1. **Define Guiding Principles and Form Problem Statements:**

- Define and illustrate principles for solutions explored in policy development
- Form problem statements collaboratively to reflect stakeholder concerns and scope policy development

2. **Align on priorities and establish cadence**

- Balance staff and stakeholder bandwidth

3. **Illustrate/Justify problem statements and proposed solutions:**

- Explore current ISO market operations, functionality, processes meant to address problem statements and receive stakeholder proposals on solutions

4. **Produce Action Plan and move into Policy Development**

- Have a plan for each problem statement
- Provide a bridge between working groups and straw proposal development

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

- **Overview of Issue Paper**
- **Focus on Guiding Principles and Problem Statements**
 - “Accept” Guiding Principles and Problem Statements agreed upon by the community for the Policy Development phase
 - Identify Guiding Principles and Problem Statements that need further refinement to reflect needs and concerns
 - Capture newly proposed Guiding Principles and Problem Statements to be explored further within Working Group structure inclusive of Stakeholder Presentation



California ISO

Price Formation Enhancements Issue Paper Overview

James Friedrich, Lead Policy Developer, Policy Development
08/03/2023

Summary of Recent Developments & Upcoming Activities

- **Price Formation Enhancements Overview ([link](#))**
 - Posted recently on our website to guide future working group discussions.
 - Covers two main topics: Scarcity Pricing and BAA-Level Market Power Mitigation.
- **Scarcity Pricing:** Addresses CAISO's pricing mechanisms under scarcity conditions.
- **BAA-Level Market Power Mitigation:** Potential application of BAA-level market power mitigation to EDAM, possible enhancements to our methodology, and consideration of CAISO BAA inclusion.

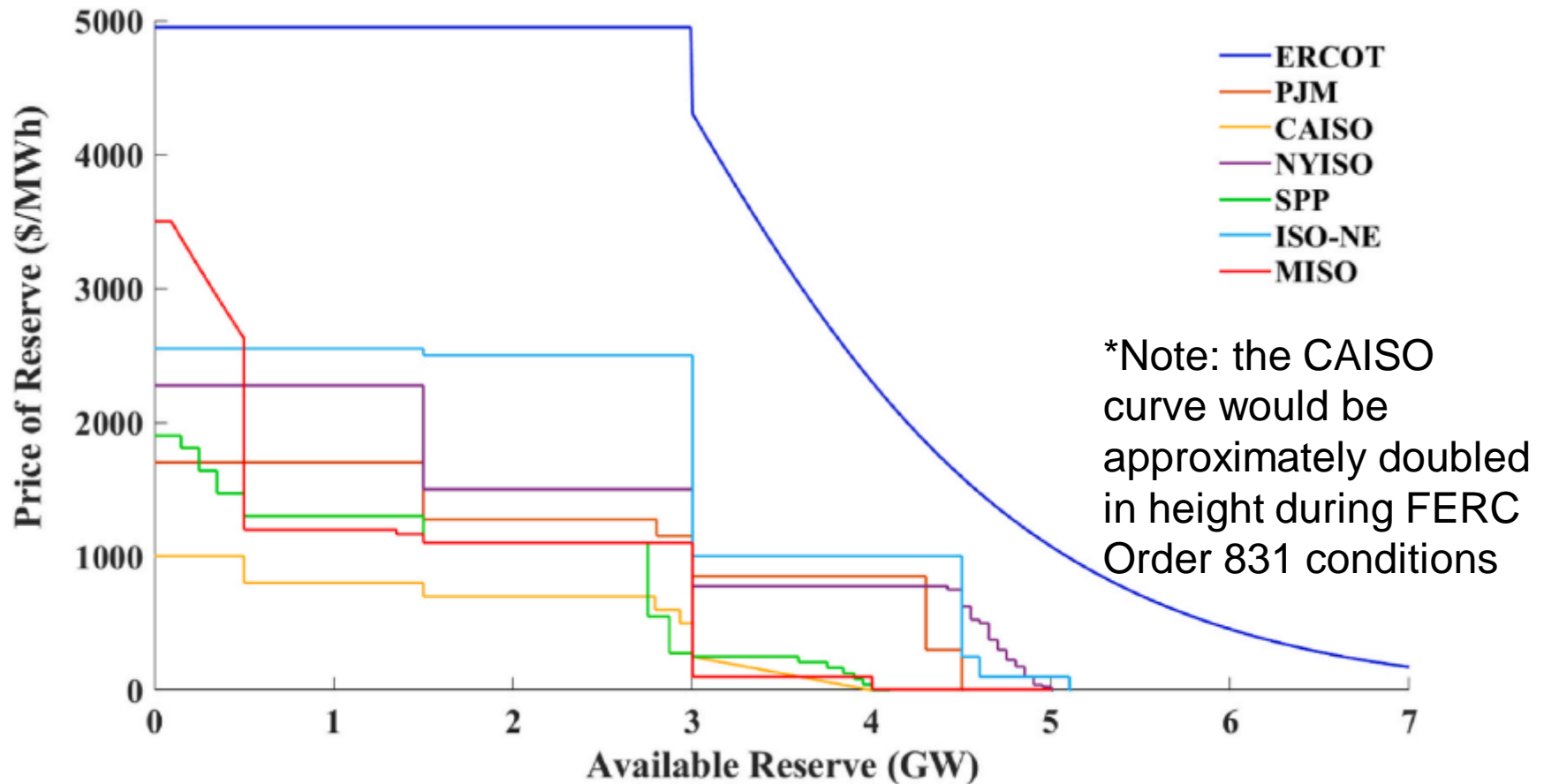
Potential Problem Statements and past Feedback

SCARCITY PRICING

CAISO's energy bid caps and penalty prices may not provide appropriate incentives for market participants during tight system conditions

- In most cases, the offer caps in effect during the day-ahead market are the same as the real-time market.
- A lack of downside risk may result in poor incentives for market participants during tight system conditions (e.g., load, supply, convergence bidders, storage resources).
- In addition, reserve scarcity values may need to be holistically re-examined.

Comparative numerical example for scarcity premiums across seven U.S. ISOs



*Note: the CAISO curve would be approximately doubled in height during FERC Order 831 conditions

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)

CAISO's ancillary service (AS) scarcity pricing might not be effective in setting scarcity prices

- AS scarcity pricing effectuates energy scarcity pricing through opportunity costs
- AS scarcity pricing might not be fully effective in setting energy scarcity prices in the ISO market for several reasons:
 - CAISO market only procures incremental ancillary services in the real-time market
 - CAISO market only applies AS scarcity pricing during an actual shortage
 - CAISO market only procures incremental AS in FMM and not RTD
 - Western Energy Imbalance Market does not procure AS outside of CAISO

CAISO's bid cost recovery rules may not provide appropriate incentives for energy storage resources during tight system conditions

- Scarcity pricing intends to reward available suppliers during tight system conditions; for storage resources that means having available SOC
- Bid cost recover (BCR) may prevent scarcity pricing from having this intended incentive effect on storage resources because it insulates them from buying back day-ahead awards or for day-ahead charging at a net loss.
- New BCR rules (or other changes) may be needed to address these challenges

CAISO may need to reevaluate administrative pricing for energy and ancillary services during periods of curtailed demand.

- CAISO could consider mechanisms to ensure the marginal energy price is the same as the power balance violation price for the entire period of curtailed demand.
- CAISO could consider mechanisms to ensure the operating reserve marginal price is the same as the power balance violation price for the entire period 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.

- This could be achieved either by modifying the settlement structure for ancillary services to mirror that of energy, or by making alterations to the 'no-pay' provisions of 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 could consider updating energy storage resource bids/DEBs to scale to \$2000/MWh to reflect the true value and opportunity cost of these resources

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.

- Non-market demand response and strategic reserve resources can play a crucial role in maintaining grid reliability during tight system conditions.
- However, the CAISO market currently lacks a mechanism to reflect these resources in real-time price formation.
- This could lead to price signals that do not accurately represent the state of the system.

CAISO's market does not currently have a "circuit breaker" mechanism in the event scarcity pricing occurs for an extended period of time.

- If scarcity pricing occurs for an extended period of time, it could lead to very high prices that could be economically damaging without any commensurate operational benefit.
- A 'circuit breaker' mechanism would intervene in such situations as a stop loss to mitigate these high prices when they no longer provide incentives for suppliers
- Similar discussions ongoing in PJM and ERCOT

Potential Problem Statements

BAA-LEVEL MARKET POWER MITIGATION

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.

- 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.

Market power mitigation could be made more accurate and efficient by grouping balancing authority areas together when performing the DCPA.

- Market power mitigation measures are applied independently for each balancing authority area, not considering the competitive supply across a group of areas.
- CAISO put forth a grouping methodology in the June 2022 Issue Paper

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.
- Alternative grouping methodologies may need consideration and may provide a better balance between computational complexity and accuracy.
 - 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.

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.

- The CAISO BAA is not part of BAA-level MPM tests performed in the WEIM

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 conduct test evaluates whether a supplier's offer is significantly higher than the reference cost of energy for that technology type.
- The impact test determines whether that offer would significantly impact the market prices.
- If a supplier is found to have failed both conduct and impact tests, mitigation measures can be applied.

How BAA-level market power mitigation applies to BAAs that fail the Resource Sufficiency Evaluation (RSE) should be considered

- Should BAA-level mitigation procedures apply differently to BAAs that fail the RSE?

Guiding Principles to enhance the CAISO's scarcity pricing mechanisms

- 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.
- **NEW:** Protect from scarcity pricing provisions triggered through the exercise of market power

Current Scarcity Pricing Guiding Principles



- Slido Polling for further discussion

Objectives of BAA-level market power mitigation discussion

- 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.
- 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.

Gauging feedback on BAA MPM discussion paper topics



- Slido Polling for further discussion

Next Working Group Session

- Continue discussion on Guiding Principles and Problem Statements
 - Please let us know if you are interested in presenting

Next Steps – Schedule

August						
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		



- Aug 3, 2023 – Working Group Session 1 – Hybrid
 - Summer Performance Market Report June 2023 call at 11am, and Energy Storage Enhancements Hybrid Workshop at 1pm
- Aug 10, 2023 – Working Group Session 2 – Hybrid
- Aug 17, 2023 – Working Group Session 3 – Hybrid
- Aug 23, 2023 – Working Group Session 4 – Virtual

September						
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

- Sep 4, 2023 – Holiday – Office Closed
- Sep 7, 2023 – Working Group Session 6 – Virtual
- Sep 14, 2023 – Working Group Session 7 – Virtual
- Sep 28, 2023 – Working Group Session 9 – Hybrid
 - Market Performance and Planning Forum Q3 at 9am

October						
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
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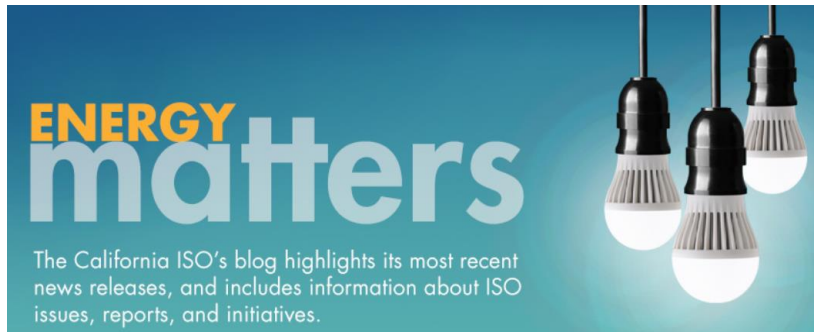
- Oct 4, 2023 – Working Group Session 10 – Virtual
- Oct 11, 2023 – Working Group Session 11 – Virtual
- Oct 18, 2023 – Working Group Session 12 – Virtual
- Oct 26, 2023 – Working Group Session 13 – Hybrid

 Hybrid Working Group
 Virtual Working Group

Please note the working group date is tentative until confirmed through a notice in the ISO's daily briefing.

For reference

- Visit initiative webpage for more information:
<https://stakeholdercenter.caiso.com/StakeholderInitiatives/Price-formation-enhancements>
- If you have any questions, please contact Brenda Corona at bcorona@caiso.com or isostakeholderaffairs@caiso.com
- Working Group Session #2 - August 10, hybrid – to [register](#) to attend in person
 - Review Overview Paper, stakeholder submitted topics and scope items
 - Stakeholder presentations on principles (ongoing through working group series)



- *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>.

Read a recent article featured in the blog:



July 24, 2023
Transmission

A big step forward on transmission infrastructure

By Deb Le Vine, Director, Infrastructure Contracts & Management

As anyone in the electricity business knows, planning, siting, permitting, financing and building transmission infrastructure is a complex, time-consuming and difficult process. Congress, the Federal Energy Regulatory Commission (FERC), state legislators and bulk electric system operators like the California ISO and others around the country ...

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Next PFE Working Group: Aug. 10th

at 1:00 P.M

