Unwarranted Storage Bid-Cost Recovery (USBCR)

Today's Presenters…

- **Manager, Market Settlement Disputes:** Uma Ramanathan
- **Customer Readiness Trainer:** Dottie Vance

Options for Asking Questions

REMAIN MUTED

Keep yourself muted to minimize background noise

ASKING QUESTIONS

Unmute to ask verbal questions or write in the chat pod

RAISING HAND

Raise your hand using WebEx interactivity tools

Materials – Posted on the ISO Training Center

TRAINING MATERIALS

This presentation and recording will be posted on the ISO website in the Training Center. The recording is for informational and convenience purposes only. Any related transcriptions should not be reprinted without the ISO's permission.

Today's Learning Objectives…

UNDERSTAND Understand how to correctly apply the relevant rules and formulas to validate real-time energy bid prices for Optimal Energy.

IDENTIFY Identify which Trade Date(s) the rule will be applied to, ensuring accurate application within the energy bid process.

REVIEW Review which statement(s) will reflect corrections made to the real-time energy bid prices, and how those corrections will be documented.

EXAMINE Examine the changes to the Real-Time Energy Bid Cost calculations impact the BCR charge codes and the overall settlement process.

Project Timeline

Project Overview

Project Objective

This project updates the calculation of real-time Bid Cost Recovery for Limited energy storage resources (LESRs)

Optimal Quantity Bill Determinants

BA_5M_RSRC_FMM_IIE_OPT_QTY
BA_5M_RSRC_IIE_OPT_QTY
(Note: There will be no changes to the quantity).

Impacted Users & Resource Type

Users: CAISO, WEIM and EDAM BAAs
Resource: LSERs

Price Bill Determinants

BA_5M_RSRC_FMM_ENGY_BID_PRC
BA_5M_RSRC_RTM_ENGY_BID_PRC

Impacted Charge Codes

6620
66200

6620 Real-Time Market (RTM) Bid Cost Recovery (BCR) Settlement
66200 Real-Time Bid Cost Recovery EIM Settlement

Activation

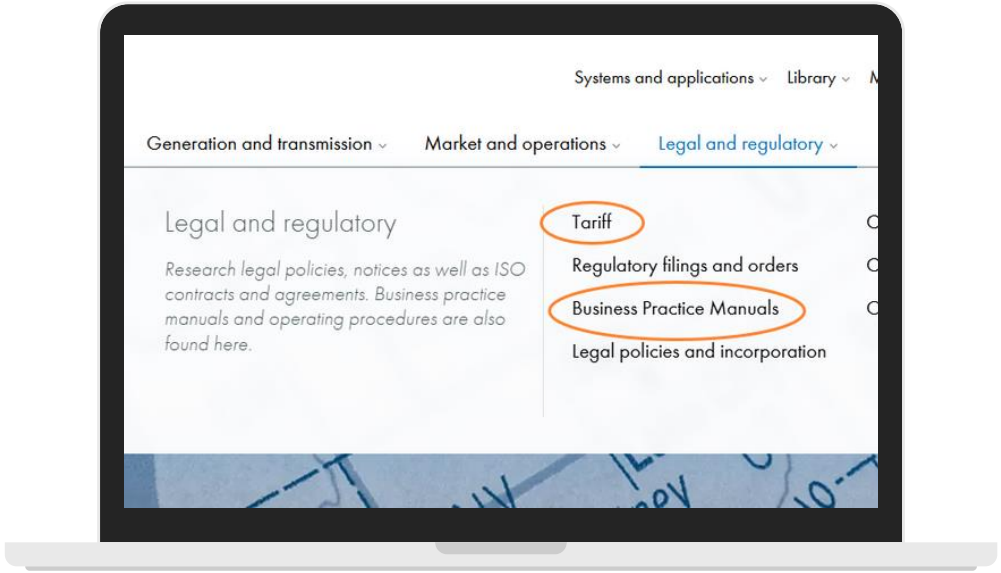
Settlements will apply the revised real-time bid price rules with effective from Trade Date 12/1/2024

LIVE

Tariff and BPM Impacts

Tariff Sections

- 11.8.4.1.5. RTM Energy Bid Cost
  - 11.8.4.1.5.1. RTM Energy Bid Cost for Storage Resources
- 29.11 Settlements and Billing for EIM Market Participant
  - 29.11 – (f) Real-Time Bid Cost Recovery
- 29.11 – (f) – (3) RTM Energy Bid Cost for Storage Resource



Business Practice Manual (BPM) - Market Operations

CAISO will update the rules for applying the prices to Optimal Energy (OE) for LESRs in Appendix C section of the Market Operations BPM and we will communicate the related Proposed Revision Request (PRR) at a later date.

What Questions Do You Have?

Unmute yourself

or

Raise your hand

Modification to the Real-Time BCR Calculation for Storage Resources

Dispatch Up

The equation selects the **lowest** of the three listed prices, then compares it to the original final bid price and uses whichever is **higher**

- Real-Time Default Energy Bid (RT-DEB)
- Real-Time Locational Market Price (RTPD or RTD LMP)
- Day-Ahead Locational Market Price (DA LMP)*

Dispatch Down

The equation selects the **highest** of the three listed prices, then compares it to the original final bid price and uses whichever is **lower**

- Real-Time Default Energy Bid (RT-DEB)
- Real-Time Locational Market Price (RTPD or RTD LMP)
- Day-Ahead Locational Market Price (DA LMP)*

*Note: The DA LMP comparison only applies if the storage resource had a Non-Zero Day-Ahead schedule.

Incremental Optimal Energy Equations *(Dispatch Up)*

If **DA schedule exists**, the Revised Bid Price =

Min(Real-Time Original Bid Price, **Max**(RT-DEB, RTPD/RTD LMP, DA LMP))

If **no DA schedule**, the Revised Bid Price =

Min(Real-Time Original Bid Price, **Max**(RT-DEB, RTPD/RTD LMP))

Example: Dispatch Up with Non-Zero DA Schedule

Trade Date	Time Interval	Resource ID	Market Type	Energy Bid Type	Energy Type Code	MWH	Bid Price (Original)	DA LMP	FMM/RTD LMP	RT-DEB Price	Bid Price (Revised)	Energy Bid Cost (Original)	Energy Bid Cost (Revised)	Energy Market Revenue	Net Amount (Original)	Net Amount (Revised)
2/1/2025	16:00	123456	RTD	F	OE	2.2705	369.09	$39.30	$21.29	$101.73	$101.73	$838.02	$230.97	$48.34	$789.68	$182.62

Key Values

Original Bid Price = $369.09

RT-DEB = $101.73

RTPD/RTD LMP = $21.29

DA LMP = $39.30

Formula

Revised Bid = Min(Original Bid, Max(RT-DEB, RT LMP, DA LMP))

→ **Min**(369.09, **Max**(101.73, 21.29, 39.30))

→ **Min**(369.09, 101.73)

→Revised bid = **$101.73**

Example: Dispatch Up with 0/Null DA Schedule

Trade Date	Time Interval	Resource ID	Market Type	Energy Bid Type	Energy Type Code	MWH	Bid Price (Original)	DA LMP	FMM/RTD LMP	RT-DEB Price	Bid Price (Revised)	Energy Bid Cost (Original)	Energy Bid Cost (Revised)	Energy Market Revenue	Net Amount (Original)	Net Amount (Revised)
2/1/2025	16:05	123456	RTD	F	OE	8.0750	369.09		$20.15	$101.73	$101.73	$2,980.40	$821.43	$162.75	$2,817.66	$658.69

Key Values

Original Bid Price = $369.09

RT-DEB = $101.73

RTPD/RTD LMP = $20.15

Formula

Revised Bid = Min(Original Bid, Max(RT-DEB, RT LMP))

→ **Min**(369.09, **Max**(101.73, 20.15))

→ **Min**(369.09, 101.73)

→Revised bid = **$101.73**

Decremental Optimal Energy Equations *(Dispatch Down)*

If **DA schedule exists**, the Revised Bid Price =

Max(Real-Time Original Bid Price, **Min**(RT-DEB, RTPD/RTD LMP, DA LMP))

If **no DA schedule**, the Revised Bid Price =

Max(Real-Time Original Bid Price, **Min**(RT-DEB, RTPD/RTD LMP))

Example: Dispatch Down with Non-Zero DA Schedule

Trade Date	Time Interval	Resource ID	Market Type	Energy Bid Type	Energy Type Code	MWH	Bid Price (Original)	DA LMP	FMM/RTD LMP	RT-DEB Price	Bid Price (Revised)	Energy Bid Cost (Original)	Energy Bid Cost (Revised)	Energy Market Revenue	Net Amount (Original)	Net Amount (Revised)
2/1/2025	16:15	123456	RTD	F	OE	-0.7693	384.49	$39.30	$24.13	$101.73	$384.49	($295.80)	($295.80)	($18.57)	($277.23)	($277.23)

Key Values

Original Bid Price = $384.49

RT-DEB = $101.73

RTPD/RTD LMP = $24.13

DA LMP = $39.30

Formula

Revised Bid = Max(Original Bid, Min(RT-DEB, RT/FMM LMP, DA LMP))

→ **Max**(384.49, **Min**(101.73, 24.13, 39.30))

→ **Max**(384.49, 24.13)

→Revised bid = **$384.49**

Example: Dispatch Down without 0/Null DA Schedule

Trade Date	Time Interval	Resource ID	Market Type	Energy Bid Type	Energy Type Code	MWH	Bid Price (Original)	DA LMP	FMM/RTD LMP	RT-DEB Price	Bid Price (Revised)	Energy Bid Cost (Original)	Energy Bid Cost (Revised)	Energy Market Revenue	Net Amount (Original)	Net Amount (Revised)
2/1/2025	16:20	123456	RTD	F	OE	-0.5694	369.09		$26.04	$101.73	$369.09	($210.16)	($210.16)	($14.83)	($195.33)	($195.33)

Key Values

Original Bid Price = $369.09

RT-DEB = $101.73

RTPD/RTD LMP = $26.04

Formula

Revised Bid = Max(Original Bid, Min(RT-DEB, RT/FMM LMP))

→ **Max**(369.09, **Min**(101.73, 26.04))

→ **Max**(369.09, 26.04)

→Revised bid = **$369.09**

What Questions Do You Have?

Unmute yourself

or

Raise your hand

Managing Multi-Segment Bid Price Allocation

Only Real-Time Final bid prices get changed by this process **EXCEPT:**

- When two records for different bid segments get changed to the same price.
- MWs are summed together to indicate all the Optimal Energy receives the same price.

Current					
Trade Date	Hour Ending	Interval	Energy Type	EE MWH	Original Bid Price
5/6/2025	15	3	OE	1.03	$32
5/6/2025	15	3	OE	0.78	$35
Revised					
Trade Date	Hour Ending	Interval	Energy Type	EE MWH	Revised Bid Price
5/6/2025	15	3	OE	1.81	$28

Implementation in Production

CAISO will be implementing the fix in production starting from **Trade Date 9/17/2025**.

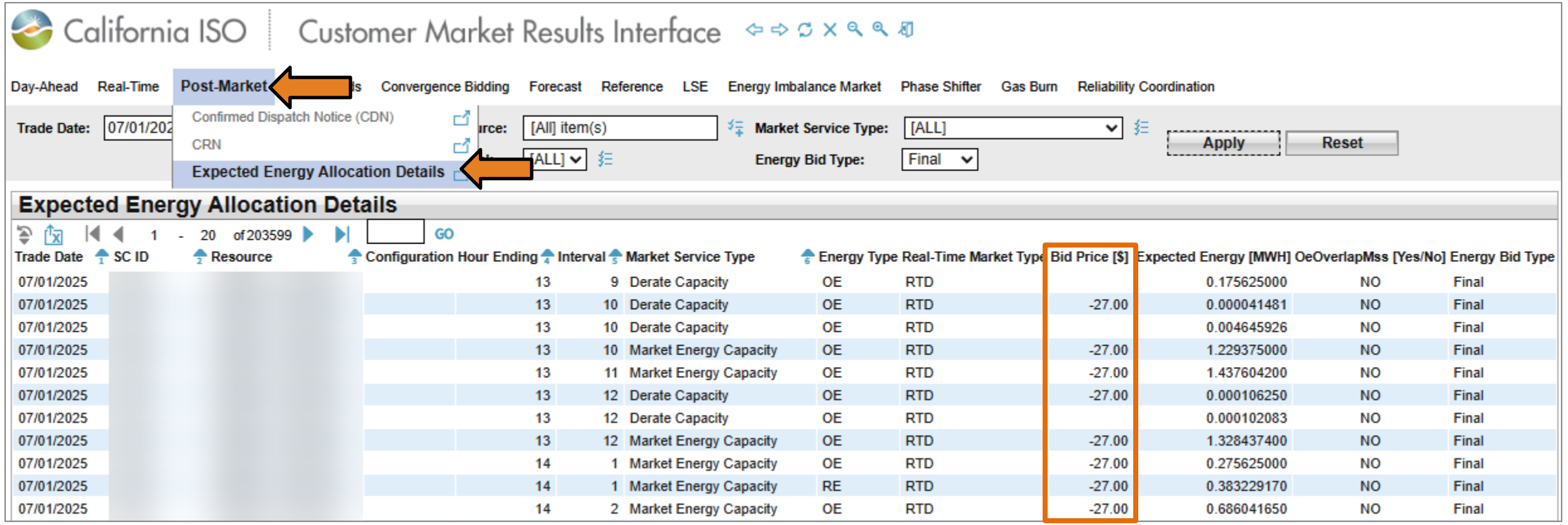
- Corrections regarding this change will follow the schedule below:

Statement	Trade Dates
T+11M	12/1/2024 through 6/23/2025
T+70B	6/24/2025 through 9/9/2025
T+9B	9/10/2025

The CAISO tested 5/6/25 Trade Date in the Stage environment. These statements will not be published. For questions or requests of additional review, please submit a CIDI Inquiry Ticket.

Existing Report Customer Market Results Interface (CMRI)

Navigation: Market Participant Portal (MPP) > CIRA > Post-Market > Expected Energy Allocation Details



Trade Date	SC ID	Resource	Configuration Hour Ending	Interval	Market Service Type	Energy Type	Real-Time Market Type	Bid Price [$]	Expected Energy [MWH]	OeOverlapMss [Yes/No]	Energy Bid Type
07/01/2025			13	9	Derate Capacity	OE	RTD		0.175625000	NO	Final
07/01/2025			13	10	Derate Capacity	OE	RTD	-27.00	0.000041481	NO	Final
07/01/2025			13	10	Derate Capacity	OE	RTD		0.004645926	NO	Final
07/01/2025			13	10	Market Energy Capacity	OE	RTD	-27.00	1.229375000	NO	Final
07/01/2025			13	11	Market Energy Capacity	OE	RTD	-27.00	1.437604200	NO	Final
07/01/2025			13	12	Derate Capacity	OE	RTD	-27.00	0.000106250	NO	Final
07/01/2025			13	12	Derate Capacity	OE	RTD		0.000102083	NO	Final
07/01/2025			13	12	Market Energy Capacity	OE	RTD	-27.00	1.328437400	NO	Final
07/01/2025			14	1	Market Energy Capacity	OE	RTD	-27.00	0.275625000	NO	Final
07/01/2025			14	1	Market Energy Capacity	RE	RTD	-27.00	0.383229170	NO	Final
07/01/2025			14	2	Market Energy Capacity	OE	RTD	-27.00	0.686041650	NO	Final

What Questions Do You Have?

Unmute yourself

or

Raise your hand

Next Steps

ACTIVATION IN PRODUCTION ENVIRONMENT AFTERNOON OF 9/17/25

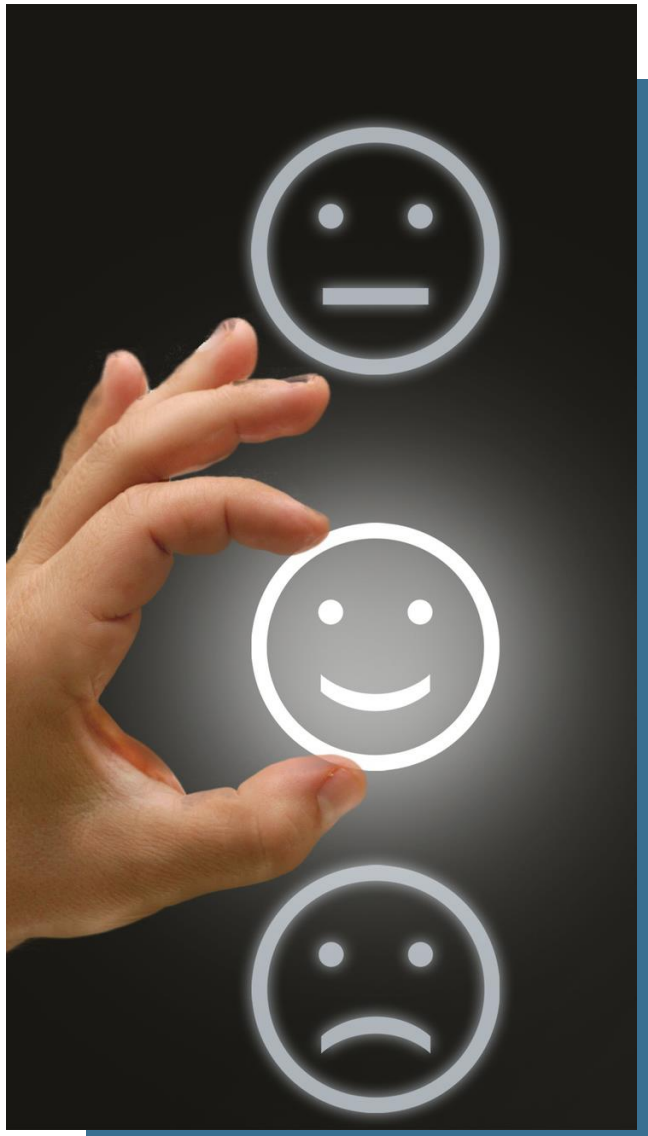
Settlements will apply the revised real-time bid price rules with effective from Trade Date 12/1/2024

Submit a CIDI Inquiry Ticket for Project Questions

For questions or requests of additional review, please submit a CIDI Inquiry Ticket and the ISO can set up a separate call.

MATERIALS POSTED

As a reminder, the slide deck and video recording will be posted to the Training Center as soon as available *(three business days).*



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Helps us improve future training

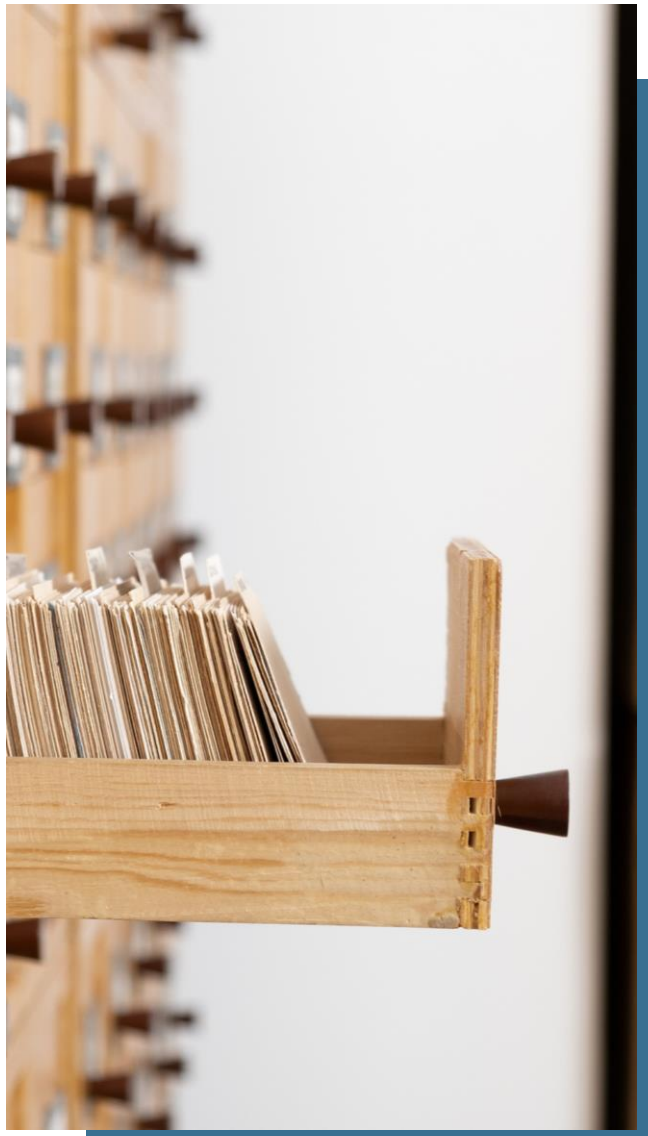
Link: https://www.surveymonkey.com/r/caisocoursesurvey

Thank you for your participation!

For clarification on anything presented in this training, send an email to: CustomerReadiness@caiso.com

For other questions or stakeholder specific questions or concerns use one of these methods:

- Submit a CIDI ticket
- Contact your Scheduling Coordinator
- Use the "Contact us" page on caiso.com to submit questions



Reference Links

Settlement Webpage

- https://www.caiso.com/market-operations/settlements

Training Center:

- https://www.caiso.com/stakeholder/training/releases-and-initiatives

Settlement Examples for USBCR Project:

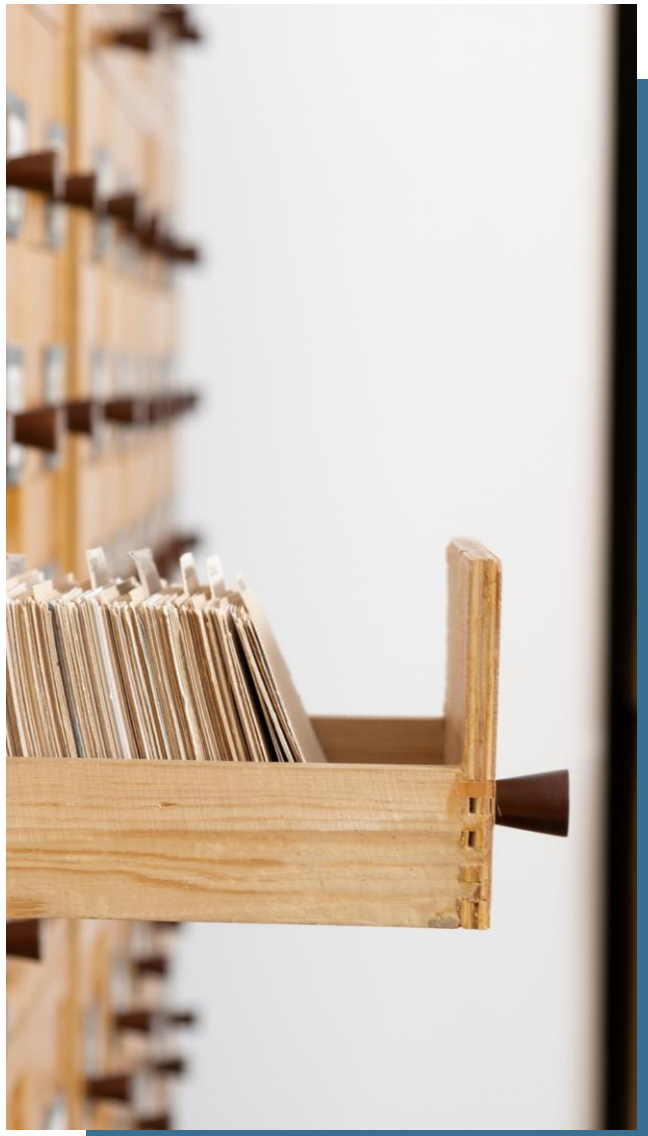
- https://www.caiso.com/documents/settlement-examples-for-unwarranted-storage-bid-cost-recovery-project.xlsx

Business Requirement Specification (BRS):

- https://www.caiso.com/documents/external-business-requirements-specification-unwarranted-storage-bid-cost-recovery.pdf

Settlement User Group (SUG):

- https://www.caiso.com/meetings-events/topics/settlement-user-group



Reference Links

Policy:

- Final Proposal - Storage Bid Cost Recovery and Default Energy Bids Enhancements - Oct 31, 2024
- Presentation - Storage Bid Cost Recovery and Default Energy Bids Enhancements - Nov 19, 2024

Revised Tariff:

- Revised Draft Tariff Language - Storage Bid Cost Recovery and Default Energy Bids Enhancements - Nov 18, 2024

Filed Tariff:

- Nov 26, 2024 Tariff Amendment Bid Cost Recovery to Storage Resources (ER25-576)

Business Practice Manual (BPM) – Market Operations:

- https://bpmcm.caiso.com/Pages/BPMDetails.aspx?BPM=Market%20Operations

Incremental Optimal Energy v. Decremental Optimal Energy

Incremental Optimal Energy

If DA scheduled exists

- Revised Bid Price = Min(Real-Time Original Bid Price, Max(RT-DEB, RTPD/RTD LMP, DA LMP))

- If no DA schedule
  - Revised Bid Price = Min(Real-Time Original Bid Price, Max(RT-DEB, RTPD/RTD LMP))

Decremental Optimal Energy

If DA schedule exists

- Revised Bid Price = Max(Real-Time Original Bid Price, Min(RT-DEB, RTPD/RTD LMP, DA LMP))

- If no DA schedule
  - Revised Bid Price = Max(Real-Time Original Bid Price, Min(RT-DEB, RTPD/RTD LMP))