

Market Performance and Planning Forum

Q3

September 18, 2024

Housekeeping Forum Reminders:

- This quarterly forum that engages stakeholders in review of market performance issues and in high level dialogue on release planning, implementation and new market enhancements. This is intended to foster open dialogue and sharing of ideas and perspectives
- This call is being recorded for informational and convenience purposes only. Any related transcriptions should not be reprinted without ISO's permission.
- Please keep comments brief and refrain from repeating any comments previously made.



Instructions to ask a question

- Select the raise hand icon blocated 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.
- Phone only use *3 when dialed into the meeting.
 - Please remember to state your name and affiliation before making your comment.
- If you need technical assistance during the meeting, please send a chat to the event producer.
- Do not mute yourself until you have completed your question or comment. WebEx platform will LOCK and mute you if you mute yourself once you have finished your question.



Objective: Enable dialogue on implementation planning and market performance issues

- Review key market performance topics
- Share updates to 2024-2025 release plans, resulting from stakeholders inputs





Market Performance and Planning Forum

Agenda – Sep 18, 2024

9 a.m. – 4 p.m. (PST)

Time:	Торіс:	Presenter:
09:00-09:05	Introduction, Agenda	Brenda Corona, Stakeholder Affairs
9:05 – 12:00	Market Performance Update	Market Performance and Advanced Analytics Short Term Forecasting
12:00-13:00	Lunch	
13:00 – 14:00	Policy Update	Becky Robinson, Market Policy Development
14:00-15:00	Release Update	Trang Vo, Project Management



MARKET UPDATE



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Agenda for Market Update

- July 2024 market performance
- Price formation enhancements Rules for bidding above the soft offer cap
- Shaping factor and maximum import bid price –Analysis and proposed enhancement
- Load conformance
- Western Energy Imbalance Market -transfer limitations
- Daily storage-resource report and data availability
- Reduction of renewable production and oversupply
- Flexible Ramping Product update
- Load and renewable forecasts
- Energy storage resources
- Gas and power prices, and CAISO wholesale costs
- General market performance metrics



July 2024 Market Performance Market Performance and Advanced Analytics



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The Western Interconnection reached a new all-time peak of 167,988 MW on July 10



This record surpassed the previous peak of 167,530 MW in 2022



CAISO's loads in July were moderate, reaching a peak of 45,426 on July 25



The peak in July 2023 was at 43,545 MW on the 24th, relatively lower than in July 2024



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CAISO's loads in June and July were relative moderate

The CAISO's load peak happened on July 25 at 45, 426 MW, below the CEC forecast of 45, 596 MW



Peak Load

Monthly CEC Forecast

The monthly RA showings were sufficient to cover CAISO's load plus operating reserves.





The monthly RA showing for July 2024 was 52,441 MW, which is higher than July 2023's monthly showing of 51,144 MW



The RA composition for the monthly RA showings for July 2024 saw moderate changes relative to July's 2023





RA capacity was sufficient in July to meet load needs, including July 25 when CAISO observed the monthly peak load





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CAISO prices increased in July, reaching maximum levels on July 24





- IFM - FMM - RTD



Prices in the imbalance market exhibit similar trend with maximum levels on July 24



- California - Central/Mountain - Pacific Northwest - Southwest





Average daily resource-adequacy capacity on outage was within typical ranges, on average, at about 5,400 MW





About 99.4 percent of RA imports bid in at or below \$0/MWh in July

The majority of imports with self schedules or bids at or below \$0 were cleared in both the dayahead and real-time markets

Up to 640 MW of bid-in RA imports could not clear given the path derates on Malin intertie due to impacts of the Park Fire





High volume of exports observed in July driven by record loads across the western interconnection

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The ISO area's average prices were generally lower than external bilateral prices. As expected, exports from the lower priced CAISO area cleared, to serve high demand outside of the balancing area.

The majority of exports were self schedules bid in the day-ahead market



DLAP SCE-APND

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The ISO's market cleared substantial volumes of exports in July, resulting in several days with a net export position





Up to 680 MW out of 690 MW of high-priority wheel-through transactions were bid in and cleared in the market in July

Source	Sink	(MW)
MALIN500	PVWEST	77
NOB	MEAD230	325
NOB	PVWEST	53
PVWEST	SYLMAR	10
RDM230	MCCULLOUG500	75
RDM230	PVWEST	150
Grand Total		690

No wheel-through transactions were curtailed in June and July

There were also modest level of low-priority wheel-through transactions participating in the **CAISO** market 800 DAM Wheel Cleared (MW) 000 000 000 0 01-Jun 04-Jun 9-Jun 07-Jun unc-0 3-Jun e-Jun 22-Jun 25-Jun 28-Jun 01-Jul 04-Jul 07-Jul 10-Jul 13-Jul 16-Jul InL-6 22-Jul 25-Jul 28-Jul 31-Jul



In July, the hour-ahead process reduced up to 900 MW of exports

HASP assesses the feasible and reliable level of exports that can be scheduled and supported for the upcoming hour

Economic and low-priority exports are reduced first to determine the optimal level of exports cleared



With the enhancements implemented on November 15 2023 to mitigate for exports deviations, the export reductions on July 2024 were largely followed



Average CAISO daily wholesale cost in July was about \$43 million with the highest at \$93 million on July 11



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Real-time offset

The WEIM facilitated balancing area access to assistance energy transfers, providing operational benefits

- There were 10 WEIM balancing areas opting into the assistance energy transfer (AET) program in July, the largest participation since its inception
- This program allows areas to receive energy transfers when they do not meet resource sufficiency requirements
- The total AET surcharges assessed in July were approximately \$520,000 for all the BAAs



RSE Failure



Areas for improvement

- Incorrect triggering of RUC infeasibility
 - On July 4 the RUC process triggered undersupply infeasibility without any prior reduction of low priority exports
 - This issue was fixed on July 5, 2024
- Incorrect reporting of exports reductions in the customer portal (CMRI)
 - This was a reporting issue and was fixed on July 9
- Incorrect loss of high priority to certain exports
 - Under different permutations of bidding in day-ahead and real-time markets, different bid validation rule triggered and resulted in unintended loss of high priority status for some exports
 - CAISO is assessing enhancements to the validation rules and an implementation date will be provided once determined



Price Formation Enhancements – Rules for Bidding Above the Soft Offer Cap Market Performance and Advanced Analytics



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Default energy bids are resource-specific verified costs

- FERC Order No. 831 requires that
 - each resource's bid is subject to a soft offer cap of \$1,000/MWh
 - Bids above \$1,000/MWh must be cost-verified by the ISO or market monitor
 - Verified cost-based incremental energy offers be capped at \$2,000/MWh
- Bids above \$1,000/MWh in ISO markets before August 1, 2024 were
 - capped by the higher of \$1,000/MWh or default energy bid (DEB)
 - However, DEBs were also capped at \$1,000/MWh
 - DEBs represent resources' marginal energy costs based on information known to the ISO i.e., DEBs are resource specific verified costs

Source: https://stakeholdercenter.caiso.com/InitiativeDocuments/Presentation-PriceFormationEnhancements-May2-2024.pdf



Modifications to increase bidding flexibility were effective August 1st, 2024

- Increase the cap on all Default Energy Bids from \$1,000/MWh to \$2,000/MWh
- Modify the bid cap for energy storage resources to provide comparable bidding flexibility using a proxy value

Source: https://stakeholdercenter.caiso.com/InitiativeDocuments/Presentation-PriceFormationEnhancements-May2-2024.pdf



Increase the default energy bid (DEB) based bid cap

- This allows hydro resources to bid up to a value that reflects the opportunity costs above \$1,000/MWh as defined by their DEB
- This also allows generating resources to bid up to a value that reflects their marginal costs above \$1,000/MWh as defined by their DEB
- Resources would not have to take action to verify these costs, but would still use the RLCR process to adjust the DEB in response to intra-day costs (no change to existing process)
- Scope: all resources with DEBs in both day-ahead and real-time markets
- **Change**: Revise the cap on all DEB calculations from \$1,000/MWh to \$2,000/MWh

<u>Bidding above the soft offer cap</u>: a bid above \$1,000/MWh is capped by max(1000, DEB, adjusted DEB)

Source: https://stakeholdercenter.caiso.com/InitiativeDocuments/Presentation-PriceFormationEnhancements-May2-2024.pdf
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Modify the bid cap for energy storage resources using a proxy value

- **Scope:** all battery storage resources with DEBs in real-time
- The DEB can go above \$1,000/MWh

- Bidding rules:
 - Bidding above the soft offer cap: a bid above \$1,000/MWh is capped by max(ECIC DEB, 1000, 4th highest RTM MIBP, highest cost-verified bid)

Source: https://stakeholdercenter.caiso.com/InitiativeDocuments/Presentation-PriceFormationEnhancements-May2-2024.pdf



PFE Bidding Above the Soft Offer Cap impact analysis from August 1 – September 8

- Increase the DEB
 - One resource had DEB above \$1,000/MWh
- Energy bid ceiling raised to \$2,000/MWh
 - The energy bid ceiling remained at \$1000/MWh from August 1 to September 4 and from September 6 to 8
 - On September 5, Maximum Import Bid Price (MIBP) exceeded \$1,000/MWh, triggering an increase in the energy bid ceiling to \$2,000/MWh
- Storage bid cap remained at \$1,000/MWh
 - No non storage DEBs for LESRs above \$1,000/MWh
 - The 4th highest RTM MIBP remained below \$1,000/MWh
 - The highest cost verified bid did not exceed \$1,000/MWh



Increase the DEB

- Only one DEB calculated above \$1,000/MWh for a hydro resource since August 1, 2024
- This bid was driven by the Opportunity Cost adder estimated for August



This bid was driven by the Opportunity Cost adder estimated for August



Storage bid cap remained at \$1,000/MWh from August 1 to September 8

- Storage bid cap = max(1000, DEB, 4th highest RTM MIBP, highest cost-verified bid)
 - No DEBs for storage resources above \$1,000/MWh
 - The highest cost verified bid did not exceed \$1,000/MWh due to:
 - the absence of a reference level change request and
 - no bids submitted above \$1,000/MWh when the DEB was above \$1,000/MWh



Storage bid cap remained at \$1,000/MWh from August 1 to September 8: 4th highest RTM MIBP only reached up to \$488/MWh in RTM on September 5



— DAM — RTM



All bids for storage resources submitted above \$1,000/MWh were capped at \$1,000/MWh in RTM since storage bid cap remained at \$1,000/MWh





Storage resources bids in DAM were capped at \$1,000/MWh



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Storage resources bids in DAM were capped at \$1,000/MWh



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Storage resources bids in RTM were capped at \$1,000/MWh



Storage resources bids in RTM were capped at \$1,000/MWh



Data for September includes only the first days of the month



With the implementation of the enhancement, there was a bid validation issue with a very narrow and isolated impact

- Condition 1: Storage resource energy bid had 2 segments, one for charging and one for discharging:
- Condition 2: Discharging bid was submitted above \$1,000/MWh
- Outcome: charging bid was revised inappropriately to \$0/MWh

MW1	MW2	Initial Bid	Revised Bid	Expected result	Comment
-75	0	-150	0	-150	Bid revised inappropriately
0	75	2000	1000	1000	Bid capped at \$1000 appropriately

- Impact:
 - Two resources affected for first day of August
 - Day-ahead market (DAM) only
- Issue corrected in Production on 7/31/24 before real-time market for August 1



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With the implementation of the enhancement, there was a bid validation issue with a very narrow and isolated impact

- Condition 1: Storage resource energy bid had 3 or more segments:
- Condition 2: Only discharging bid for highest segment was submitted above \$1,000/MWh
- Condition 3: Any lower segment bid above DEB
- Outcome: Any lower segment bid above DEB was revised inappropriately to DEB

DEB	MW1	MW2	Initial Bid	Revised Bid	Expected result	Comment
0.2	-10	0	-15	-15	-15	Bid allowed as is
0.2	0	5	65	0.2	65	Bid revised inappropriately to DEB
0.2	5	10	1050	1000	1000	Bid capped at \$1000 appropriately

- Impact:
 - Two resources affected for two days of August
 - Real-time market (RTM) only
- Issue corrected in Production on August 8



Shaping factor and maximum import bid price analysis and proposed enhancement Market Performance and Advanced Analytics



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Background on FERC Order No. 831 – Import Bidding and Market Parameters initiative

- FERC Order No. 831 (2016)¹ directed ISOs/RTOs to allow cost-verified energy bids above \$1,000/MWh up to \$2,000/MWh
- CAISO opened the stakeholder initiative titled "FERC Order 831 Import Bidding and Market Parameters"² to comply with the order
 - The Max Import Bid Price (MIBP) calculation was a way to screen import/virtual supply bids above \$1,000/MWh
 - MIBP is intended to represent prevailing energy prices outside of the CAISO area using two main bilateral power hubs: Mid-C, Palo Verde
 - Bilateral power prices are published in multi-hour blocks (on-peak and off-peak)
 - MIBP enables CAISO to translate block power prices into an hourly curve, reflecting the fact that CAISO prices vary hourly

2 Initiative home page: <u>https://stakeholdercenter.caiso.com/StakeholderInitiatives/FERC-Order-831-Import-bidding-and-market-parameters</u>



¹ FERC order text: https://www.ferc.gov/sites/default/files/2020-06/RM16-5-000.pdf

The hourly energy shaping factor is used in the Maximum Import Bid Price calculation to scale block bilateral prices

- During the Maximum Import Bid Price Analysis Workshop on May 28, CAISO presented analysis and discussed potential improvements to the shaping factor
- Implications of the current formulation and a literal shaping factor were explored and compared for high-priced historical days
- Stakeholders provided feedback regarding the formulation and application of the shaping factor
- The proposed enhancement to the current shaping factor is to change the calculation for alignment of days used in the shaping factor
- The enhancement is expected to be implemented in Mid November

May 28 workshop: <u>https://www.caiso.com/meetings-events/topics/miscellaneous-meetings</u> White paper: <u>https://www.caiso.com/documents/whitepaper-maximum-import-bid-shaping-factor.pdf</u> Presentation: <u>https://www.caiso.com/documents/presentation-maximum-import-brid-price-workshop-may-28-2024.pdf</u>



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Proposed enhancement to the hourly energy shaping factor uses the Literal formulation derived from a literal reading of the Tariff where the days used are aligned

Current:

Hourly DA SMEC_{current}

Average DA SMEC_{high-priced}

Literal:

 $\frac{Hourly \, DA \, SMEC_{high-priced}}{Average \, DA \, SMEC_{high-priced}}$

 $MIBP_i = Electric Hub Price_{TOU} * Hourly Shaping Factor_i * 1.1$

Where:

i : hour between 1 and 24 Electric Hub Price : the maximum of Mid-C or Palo Verde bilateral index price TOU : Time of use, peak or off-peak

2 Presentation: https://www.caiso.com/documents/presentation-maximum-import-brid-price-workshop-may-28-2024.pdf



¹ White paper: <u>https://www.caiso.com/documents/whitepaper-maximum-import-bid-shaping-factor.pdf</u>

Proposed enhancement to the hourly energy shaping factor needs to consider some nuanced conditions

- The shaping factor is an hourly value, and there are days when the hours of the high-priced day and trading day will be misaligned
 - Daylight Savings short day (March) has 23 hours
 - Daylight Savings long day (November) has 25 hours
 - Daylight Savings change falls within Winter season (November to March) such that days before and after change have different time zone conversion
 - Days with all Off-peak hours (Sundays)
- Proposed logic re-aligns the two days by matching the start and end times of each hour



Shaping Factor and MIBP analysis from August 1 to September 8

- Energy bid ceiling raised to \$2,000/MWh
 - The energy bid ceiling remained at \$1000/MWh from August 1 to September 4 and from September 6 to 8
 - On September 5, Maximum Import Bid Price (MIBP) exceeded \$1,000/MWh, triggering an increase in the energy bid ceiling to \$2,000/MWh
- Current and literal shaping factors were the same on high priced days September 5 to 7
 - Literal shaping factor was higher in the days leading to the high-priced period



MIBP increased above \$1,000/MWh on September 5 – Energy Bid Ceiling was raised to \$2,000/MWh



MIBP increased above \$1,000/MWh on September 5 – next-day on-peak bilateral power prices spiked above \$250/MWh at the Mid-C hub; shaping factor spiked



- MIDC - PV



Current and Literal MIBP converged to the same value for September 5 to 7





Current and Literal shaping factors converged to the same value for September 5 to 7 as the current day became the high-priced day



Literal Shaping Factor — Current Shaping Factor



Load conformance

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The primary objective of load conformance is different for each market

Residual Unit Commitment (RUC adjustments):

Commit sufficient capacity to meet operational risks, including net-load uncertainty Hour-Ahead/Fifteen minute market:

Position resources to have needed supply and ramp capability

Real-time Dispatch:

Manage deviations and power imbalances



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The guidance, magnitude and frequency of RUC adjustments have evolved over the years



Over this period there has been a significant evolution of the resource mix including growth of utility-based and behind-the-meter solar generation



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ISO has continued to enhance the estimates used to guide RUC adjustments to cover for net load uncertainty



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Hourly profile of RUC adjustments in Q2 2024 were mild but they increased in Q3 with summer conditions





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High bid cost recovery in RUC subsided since the enhancement to the requirement estimates in December 2023



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ISO has continued to assess the need to use RUC adjustments in all seasons and their cost-benefit

- ISO further tuned the logic on May 7, 2024 to consider projected supply available, and weather conditions in ISO area and the wider footprint
- For non-summer months, this has resulted in using lower percentiles and targeting only peak hours
- These enhancements consequently have resulted in lower requirements
- These logic enhancements were captured in updates to the public ISO Operating Procedure 1210
- RUC adjustments are posted publicly
- As the system faced summer conditions, the logic is being further adjusted with higher requirements for all peak hours
- This has resulted in higher RUC adjustments during the summer timeframe
- The ISO will continue to update OP1210 to reflect any further adjustments to the current practice



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CAISO continues to analyze the root causes for the need to use load conformance

Load conformance is lastopportunity to address current and projected mismatch between markets and the system

From this effort, ISO has identified the need to enhance formulation to account for state of charge for storage resources procuring FRP





ISO has been evaluating the use and implications of load conformance in the real-time market as well



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Renewable resources and oversupply

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Production of renewable resources

- Renewable resources, like other type of generation, can participate in the market with economic or self-schedule bids
- Based on price and location, the market will redispatch resources to address either oversupply or congestion
- The term "curtailment" was originally used when renewable resources used to self-schedule and the market required to curtail these
- In recent years, renewable resources have significantly increased their economic dispatch participation with price bids, allowing the market to economically redispatch. Curtailments of self-scheduled are a rare condition



About 80 percent of reductions of renewable production is mainly driven by economic congestion relief while 20 percent due to oversupply conditions

Instances of congestion are classified based on whether there is a negative marginal congestion component of the resource price.



There can be cases where both congestion and oversupply result in reductions.

This classification is based on original market dispatches and prices, and is not based on counterfactual assessments to surgically identify the extent of congestion impact from transmission upgrades.

The annual CAISO's transmission planning process provides an opportunity for stakeholders to explore the benefits of reducing congestion from transmission upgrades.



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Production of renewable resources

- The extent of congestion is wide spread, going from major and regional conditions to more local conditions
 - For instance, northbound congestion on Path 15 would require all resources in southern California to reduce generation
- When managing congestion, any type of generation including renewables can be decrementally dispatched
- The majority of reduction of renewable production has been driven by congestion
- Integration of storage resources has helped manage oversupply by charging during hours when solar production is plentiful
- Although reductions of renewable production due to congestion see an increasing trend, the integration of collocated resources can offset the need for further reductions



About 94 percent of production reduction is for solar resources



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Reduction of renewable production has increased throughout the ISO footprint





In 2024, records of max solar production were more significant, coming close to 20,000MW



The number of days with load served fully with renewable resources increased to 44 in 2024 from seven in 2023



The maximum level of load served with renewables is just below 120% The load definition consists of the forecast component plus pumps and charging side of storage



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The maximum level of load served by renewable resources happens during hours when batteries are charging, solar production is high and demand is low



Hydro production trending higher in 2024 than previous years, complementing higher solar production



Discharge of storage resources is providing increasing volumes of supply to the ISO system





Storage resources have significantly increased the energy arbitrage from midday hours to peak hours


Storage resources are helping to flatten the net load that needs to be met with conventional resources



Nuances to consider when calculating ISO's system statistics

- As the ISO system evolves and new technologies are integrated, there is a growing interest in tracking different statistics on the ISO's system performance
- The use of different conventions can lead to largely different statistics and records:
 - Variable energy resources, includes only wind and solar
 - Renewable resources also includes small hydro, geothermal and bio resources
 - Non-emitting clean resources may also include large hydro and nuclear
 - Total CAISO load needs to include pumps and charging of storage resources



WEIM transfer limitations

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The ISO balancing area limited dynamic transfers into its area between July 26 and November 16, 2023

- This practice led to price separation:
 - Higher prices in ISO area
 - Lower and economic prices in other WEIM areas
 - WEIM areas were not detrimentally impacted by this price separation as it isolated them through congestion
- This resulted in the redistribution of transfers among other balancing areas
- This practice was necessary to manage the dynamic real-time conditions observed with the July 2023 energy emergencies
- By November 15, 2023 the ISO addressed the main root causes that exacerbated the conditions of the July emergencies



The CAISO balancing area has not deployed transfer limitations throughout the 2024 summer

- Any WEIM area, including the CAISO, can apply transfer limitations to their own area at any time
- CAISO area conditions has not require to deploy this limitation again so far in the summer
- If needed, ISO expects to use this limitation on targeted intervals based on expected real-time conditions
- CAISO has also enhanced its communication protocol to more timely notify the market of transfer limitations



Daily storage report and data availability Market Performance and Advanced Analytics



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As storage resources continue to growth, since July 2022 the ISO has published a Daily storage-resource report on the CAISO Website

California ISO Daily Energy Storage Report

Wednesday, September 11, 2024 Storage Hybrid

Battery Resources - System Level





The report has attracted the interest of different sectors in the energy community

- The report is published daily and contains selected metrics on the performance of storage resources
- The reports are available at:

https://www.caiso.com/library/daily-energy-storage-reports

- There are continuous request to provide the underlying data of these reports
- The data used to generate the report is not available on OASIS system for download
- Starting in October, CAISO will make available the historical raw data and will provide regular updates moving forward
- A market notice will provide the details to access the raw data

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Flexible Ramping Product

Market Performance and Advanced Analytics Short Term Forecasting



FRP Up Requirement for CAISO area remain within typical ranges



FRP Down Requirement for CAISO area remain within typical ranges



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The daily distribution of FRP Up requirement in the last 3 months for CAISO area exhibits a steady trend





The daily distribution of FRP Down requirement in the last 3 months for CAISO area exhibits a steady trend





The hourly profile of upward FRP tends to follow a pattern of morning and evening peaks





The hourly profile of downward FRP tends to follow a complementary pattern to the upward FRP, with higher values in midday hours



Sampling scheme enhancement effective 8/14/2024

- The two mosaic enhancements planned for 2024 have been completed. Symmetric sampling was implemented effective 8/14/2024.
- The June 2024 MPPF covered FRP performance since 4/4/24 enhancement. The following slides focus on performance of FRP since the 8/14 enhancement.

FRP Timeline



Requirements have mostly decreased since sample scheme enhancement • Pre-change 7/15/24 - 8/13/24 • Post-change 8/14/24 - 9/11/24

Requirement comparison for EIM AREA FRU FRD 1800 1600 requirement magnitude [MW] 400 1200-1000-Aug 2023 Aug 2023 Post-change Pre-change Post-change Pre-change 8/14/23 -7/15/24 -8/14/24 -8/14/23 -7/15/24 -8/14/24 -9/11/23 8/13/24 9/11/24 9/11/23 8/13/24 9/11/24

Average daily requirement per period focusing on enhancement effective 8/14/2024

*Requirement plots shows daily average positive and negative requirements, FRU and FRD respectively.

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FRU AVA -AVRN · AZPS · BANC BCHA BPAT · CISO EIM AREA EPE · IPCO-LADWP NEVP -NWMT -PACE PACW · PGE PNM · PSEI · SCL SRP TEPC TIDC TPWR-WALC FRD AVA · AVRN · AZPS · BANC BCHA · BPAT CISO . EIM AREA EPE IPCO-LADWP NEVP -NWMT -PACE · PACW PGE PNM · PSEI · SCL-SRP-TEPC-TIDC -TPWR-WALC -500 1000 1500 0 Requirement magnitude [MW]

Mixed trends in daily coverage



Daily coverage pre- and post- enhancement effective 8/14/2024

Based on simulation results over one year periods, coverage is generally expected to increase with the symmetric sampling scheme enhancement. Note that results displayed here come from a limited sample (29 days per period) across different stages in summer, the latter of which included a major heat event in most entities.

*Coverage plot shows distribution of daily average mosaic coverage. Target coverage is 95% for combined FRU and FRD.



FRP Coverage





■ 2023 ■ 2024





■ 2023 ■ 2024



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FRP Requirement











FRP Exceedance







EIMAREA 450 400 350 300 FRD 250 200 150 100 50 0 Jan Feb Mar Apr Jun Aug Sep Oct Jul May Nov Dec ■ 2023 ■ 2024

The ISO is working to update the tracking metrics as discussed in the November 29th, MSC.



Upward FRP is largely procured from areas in the Pacific Northwest and California





Upward FRP procurement from CAISO area is largely occurring in the peak hours





Upward FRP procurement is supported by various types of technologies and more recently mainly by storage resources



Storage resources tend to support upward FRP procurement for evening ramping hours



Through the analysis of FRP performance, the ISO has identified the need to enhance the logic to account for state of charge when storage resources procure FRP

Frequency of intervals with non-zero FMM prices for upward FMM continues to be low after nodal implementation



Frequency of intervals with non-zero RTD prices for upward FRP continues to be low after nodal implementation



Load and Renewable Forecasts Short Term Forecasting



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Summer Temperature Debrief





Load forecast performance in CAISO and WEIM

T-60 Accuracy During Peak Hour

Average for 10 highest load days



Accuracy reported as MAPE = (T60 Forecast – Actual) / Actual



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Real time solar forecast accuracy

- System-level RT solar MAPE shows improvement compared to previous years, however we see evidence of increased positive forecast error over time. Short Term Forecasting is actively reviewing.
- Contributing factors include complexity of properly defining "actual", increased supplemental dispatch over time, growth of co-located and hybrids, HSL data quality, resource following DOT, and telemetry quality.









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Forecast Error = (Forecast – Actual) / Capacity Actual = Telemetry + Abs(Supplemental energy)

Data quality is critical to operational forecasting as it informs both model training and real-time prediction

Scheduling coordinators and operators of VERs need to :

- Provide accurate and up to date information about site capacity including outages and availability MW.
- Provide meteorological points that are in good quality and consistently reporting. Verify meteorological sensors are unobstructed throughout the year.
- Submit telemetry exemptions as appropriate. See Section 8.4 in Direct Telemetry BPM.
- For those providing a high sustainable limit (HSL) point:
 - HSL should be approximately equal to telemetry unless there is supplemental dispatch present.
 - HSL should be unaffected by supplemental dispatch.



Energy Storage Performance Market Performance and Advanced Analytics



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Energy storage enhancements Track 2 was activated on November 1, 2023

• The original state of charge equation

$$SOC_{i,t} = SOC_{i,t-1} - \left(EN_{i,t}^{(+)} + \eta_i EN_{i,t}^{(-)}\right) \frac{\Delta T}{T_{60}}$$

$$\underline{SOC}_{i,t} \le SOC_{i,t} \le \overline{SOC}_{i,t}$$

(SOC: original SOC with energy impact only)

• A new set of constraints is introduced $SOC_{i,t}^{AT} = SOC_{i,t-1}^{AT} - \left(EN_{i,t}^{(+)} + \eta_i EN_{i,t}^{(-)} + ATRU_t RU_{i,t} - ATRD_t \eta_i RD_{i,t}\right) \frac{\Delta T}{T_{60}}$

(*SOC*^{AT} : SOC with attenuation factors)



In recent months there is no material change in the share of regulation requirement supported by storage resources





Share of regulation down requirements by storage resources has steadily increased in recent months




No material change in the hourly profile of the LESR percentage share of the Ru requirement after implementation of enhancements



No material change in the hourly profile of the LESR percentage share of the Rd requirement





Monthly average IFM AS awards for storage shows no significant change in pattern



GAS WATER OTHER LESR

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Monthly IFM AS market awards show no significant change in pattern



🎯 California ISO

Regulation up awards in the day-ahead market have not seen a material change in trend





Regulation down awards in the day-ahead market have not seen a material change in trend





The relative size of Regulation award on individual resources tends to be within typical ranges



- Req-Mean

🛱 Percentage



Resource Rd awards as percentage of Rd requirement sees not notable change in pattern with enhancements



IFM Resource level regulation prices have not seen negative since the implementation of the enhancements





Real-time resource level regulation prices have not been negative since the implementation of the enhancements





As part of the storage enhancements, CAISO estimates attenuation factors for each calendar season

- Estimating the actual utilization of regulation
- Data: the corresponding quarter from the prior year
- Metric:
 - a) Data source: resource level AGC setpoint vs. DOP
 - b) Reference: RTPD regulation awards
 - c) System aggregated percentages

 $Percentage\ utilization\ Ru(Rd) = \frac{Total\ utilized\ Ru(Rd)}{Total\ Ru(Rd)awards}$



2024 Q3 (Jul – Aug) Actual utilization of regulation up remains relatively low





2024 Q3 (Jul – Aug) Actual utilization for regulation down continues to be high





Most of the time storage resources have SOC below full capacity for months from Jun to Aug 2024



🎯 California ISO

Day-Ahead state of charge for storage resources is typically achieved between hour ending 16 and 18





CAISO PUBLIC

Real-Time State of charge for storage resources was in line with the day-ahead state of charge



🍣 California ISO

CAISO PUBLIC

Storage resources were consistently charging during solar hours and discharging during net load peaks





CAISO PUBLIC

Storage resources were consistently charging during solar hours and discharging during net load peaks, and reached new highs at over 7,000MW in April and May





CAISO PUBLIC

Storage resources procure mostly regulation while in recent months they have also increased the provision of Spinning reserves. Day Ahead



RU RD SR NR



Storage resources procure mostly regulation while in recent months they have also increased the provision of Spinning reserves. Real time



📰 RU 📃 RD 📒 SR 📃 NR



Gas and Power Index Prices CAISO Market Costs Market Performance and Advanced Analytics



CAISO PUBLIC

California next-day gas prices has seen lower levels in 2024 trading compared to winter 2023



Western next-day gas prices reached elevated levels in mid-January 2024 and continue to be lower for summer 2024



Future gas prices for summer 2024 and Autumn indicates price stability but spiked in mid-January 2024, corresponding to the cold snap





Next-day on-peak bilateral power prices were responsive to high-load conditions in July 2024, spiking above \$250/MWh at the Mid-C hub



CAISO PUBLIC



Future on-peak bilateral power prices for Summer 2024 increased for August, but traded fairly lower for other future months



California ISO

Daily market costs is higher during July 2024 and reaches the lowest on May 25th, 2024





Monthly totals for 2024 remained low compared to the previous years



🍣 California ISO

Q3 2024 total costs are \$2.3B lower than Q3 2023 total costs.





CAISO PUBLIC

Monthly totals for second Quarter 2024 are lower than previous year.



California ISO

General Market Performance Metrics



CAISO PUBLIC

ISO total monthly VERS schedules and forecasts compared to actuals





Self scheduled imports increased since June



California ISO

CAISO PUBLIC

Prices increased in July due to high temperatures



Note: Metric Based on System Marginal Energy Component (SMEC)



CAISO PUBLIC

Real-time prices higher than day-ahead prices for both NP15 and SP15 in July



California ISO

Insufficient upward ramping capacity in ISO real-time remained at low levels



🍣 California ISO

Count of Intervals

CAISO PUBLIC
Insufficient downward ramping capacity in real-time stayed low



California ISO

Count of Intervals

ISO area real-time congestion and energy offset cost increased in July and fell in August



Real-time congestion offset Real-time imbalance energy offset



Exceptional dispatch volume in the ISO area remained low



🍣 California ISO

Exceptional dispatches volume driven by a variety of reasons



🍣 California ISO

Bid cost recovery (BCR) by Local Capacity Requirement area





CAISO price correction events remain low





EIM-related price corrections remain low





Day-ahead load forecast



*MAPE = abs(Forecast - Actual)/Actual



CAISO PUBLIC

Day-ahead peak forecast



*MAPE = abs(Forecast - Actual)/Actual



Day-ahead wind forecast



*MAPE = abs(Forecast - Actual)/Actual



CAISO PUBLIC

Day-ahead solar forecast



*MAPE = abs(Forecast – Actual)/Actual **MAPE only calculated for intervals where Forecast > 0



CAISO PUBLIC

Real-time wind forecast



*MAPE = abs(Forecast - Actual)/Actual



CAISO PUBLIC

Real-time solar forecast



*MAPE = abs(Forecast – Actual)/Actual **MAPE only calculated for intervals where Forecast > 0



CAISO PUBLIC

Real Time Solar Hybrid Performance *Comparison of DOT to MW Production



*MAPE = abs(DOT - Actual)/Capacity





IPCO T-60 Forecast



■2022 ■2023 ■2024 PGE T-60 Forecast

Aug

Jul

Sep

Oct

Nov

NVE T-60 Forecast



■ 2022 ■ 2023 ■ 2024



1.4%

1.2%

1.0%

0.8%

0.6%

0.4%

0.2%

0.0%

CAISO PUBLIC

Dec



PACE T-60 Forecast

PACW T-60 Forecast



-2022 -2023 -202



■ 2022 ■ 2023 ■ 2024

PSE T-60 Forecast

SRP T-60 Forecast



■ 2022 ■ 2023 ■ 2024



CAISO PUBLIC



SCL T-60 Forecast

LADWP T-60 Forecast



2022 2023



■2022 ■2023 ■2024

TIDC T-60 Forecast

PNM T-60 Forecast





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BANC T-60 Forecast

NWMT T-60 Forecast



■2022 ■2023 ■2024



AVA T-60 Forecast

BPA T-60 Forecast









The magnitude of the overall CRR settlements saw an increase in the last 2 months



California ISO

Implementation of pro-rata funding continues to improve revenue adequacy through 2024





Auction efficiency has been fairly variable based on level of congestion observed



POLICY UPDATE

Becky Robinson Director, Market Policy Development



Extended Day Ahead Market (EDAM) & Day Ahead Market Enhancements (DAME)

- On June 11th, FERC issued an order accepting the EDAM Access Charge design.
 - With that order, the EDAM Tariff is fully FERC-approved.
- In July, we held a DAME implementation stakeholder meeting to provide a testing timeline, testing approach, and set expectations on communications and engagement with stakeholders.
 - This was a precursor to our commitment to hold implementation working groups to test and refine certain "tunable parameters."
 - Stakeholder comments received September 4



DAME Implementation Working Group Schedule





WEIM Resource Sufficiency Evaluation Enhancements (RSEE)

- Implementation of enhancements to E-tagging process
 - Align market E-tags to market results to enable identification of lower priority exports in the event postmarket curtailments are necessary
 - Fully implemented as of July 2024
- July 2024 Assistance Energy Transfer activity: 10 BAs that represent majority of load served by the WEIM opted in
- Planned 2024 kick-off for RSEE Phase 3
 - Scope informed by analysis of recent peak seasons
 - Proposed Decisional Classification: Joint Authority



Price Formation Enhancements working groups

- On July 31, FERC accepted our tariff amendment to allow limited energy resources to include their opportunity costs in supply offers when they exceed the \$1,000 soft offer cap.
 - The ISO implemented this functionality on August 1.
 - The ISO will be implementing changes to the Max Import Bid Price in Q4 2024.
- On September 5, the ISO published a Discussion Paper on next steps on scarcity pricing, BAA-level market power mitigation, and fast-start pricing.
 - Working groups will begin October 2024; we encourage stakeholders to engage in these to develop the market design to form a straw proposal.



Penalty Enhancements: Demand Response, Investigation, and Tolling (PEDRIT)

- Establish materiality threshold for inaccurate meter data penalty
 - Inaccuracies < 3% or 3MWh will not be penalized
- Create late and missing demand response monitoring data penalty structure that aligns with meter data penalty structure
- Lessen administrative burden
 - Allow for FERC appeal to occur prior to penalty settlement
 - Shorten investigative process
 - Eliminate additional reporting to the Department of Energy
- Presentation at Sept. 25-26 joint session of ISO Board of Governors and WEM Governing Body for decision



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Greenhouse Gas Coordination (GHG) working group

- GHG accounting for state policies without a price on carbon emissions
 - Moving forward to design policy on an out-of-market GHG "accounting and reporting" approach, introduced and supported by stakeholders
 - Issue paper to be published this fall and continue design discussions in upcoming working groups
- GHG information and metrics
 - Heard stakeholder requests for additional GHG metrics and information to help support compliance with different state programs
 - The ISO started publishing average GHG emissions rate monthly and annual reports
 - Additional metrics reports will become available through the accounting and reporting approach
 - Finalizing GHG metrics that will be monitored with EDAM launch
- Continued review of GHG design
 - Ongoing review of GHG design in the WEIM and EDAM



Gas Resource Management working groups

- Stakeholders identified problem statements, and potential solutions, associated with three main issue areas:
 - Increasing certainty for advance fuel procurement,
 - Precision of gas market inputs used for electricity market operations, and
 - Facilitation of resource-specific cost adjustments.
- Working groups discussed analysis of gas price volatility and cost adjustment functionality to ensure diverse stakeholder experiences are accurately represented.
- Published a working group discussion paper with stakeholder recommendations for policy development in May 2024.
 Planning to publish an issue paper in September.



California ISO

Storage Bid Cost Recovery and Default Energy Bid Enhancements

- Current rules create two concerns specifically for storage resources:
 - Storage assets are not exposed to real-time prices for deviating from day-ahead schedules
 - Storage assets may have an incentive to bid strategically to maximize the combined BCR and market payments
- The ISO has held six stakeholder meetings since July and on September 4th published a Revised Straw Proposal that describes and evaluates different potential solutions.
- Policy efforts are currently focused on mitigating strategic bidding concerns in the near-term, targeting the November BOG/GB meeting
 - Efforts on this matter will continue beyond November, focusing on a holistic review of how BCR applies to energy storage resources



Inter-SC Trades in Regional Markets

- Inter-SC trades are an optional market feature facilitating settlement of aspects of bilateral contract between scheduling coordinators through the market.
 - No effect on market optimization, schedules, or dispatch.
- Inter-SC trades functionality is only supported today within the ISO balancing area.
- The initiative proposes to extend inter-SC trade for energy functionality to WEIM and EDAM areas.
- Presentation of proposal to the joint session of ISO Board of Governors and WEM Governing Body on September 26.



Transmission Services and Market Scheduling Priorities (TSMSP)

- Wheeling through priority automated systems implemented seamlessly in April.
 - Support the calculation of ATC and processing of requests for ATC.
 - New functionality for Daily ATC now implemented and market participants can now request to reserve daily ATC.
 - As of June 1 wheel through priority established through the new process (monthly and daily) can be scheduled.
- On July 8, FERC granted our petition for a limited waiver of the tariff provisions for the resale of wheeling through priority filed in April.
 - FERC waiver is through December 17, 2024.
 - Anticipate implementation of this feature in Q4 2024.
- TSMSP phase 2, focused on the study and expansion process for establishing long-term wheel through priority, is being evaluated in light of Order No. 2023 interconnection process enhancements and FERC guidance.



Resource Adequacy (RA) working groups

The working group issued a *Revised Discussion Paper and Final Recommendations* paper. The ISO will publish an Issue paper on the topics in the tracks this Fall, while remaining items will be discussed in a future working group:

Track 1: Modeling & Default Standards

LOLE Modeling

- Default PRM and default counting
- UCAP for default counting, in collaboration with the CPUC and other LRAs
- Incorporating ambient derates due to temperature

Track 2: Outage and Substitution & Availability and Performance Incentives

Updating the ISO's outage and substitution processes

Reforming availability and performance incentives

Track 3: Backstop Reform

- · Increase the ISO's visibility into available backstop capacity
- Increase transparency to stakeholders on backstop decision making
- Updating the current backstop product
- · Longer-term solutions for the ISO BAA around curing deficiencies and assigning costs related to the EDAM RSE

Continued Working Group Topics

- Requirements for RA capacity (energy sufficiency, Flex RA)
- Deliverability
- · Continual assessment of interoperability with existing and emerging RA programs



Policy Initiatives Catalog & Roadmap

- 2024 Final Discretionary Policy Initiatives Catalog released in July
 - Describes stakeholder-identified priorities among the discretionary policy initiatives submitted by stakeholders
 - Catalog items & stakeholder prioritization considered as an input to the Policy Roadmap, the work plan for future policy initiatives
- Draft Policy Roadmap to be released October
- Final Policy Roadmap by end of year
- 2025 Catalog & Roadmap development begins January with stakeholder submissions of policy initiative proposals California ISO CAISO PUBLIC



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Policy initiative process



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

This represents the typical process, and often stages run in parallel. *Discussion papers and working groups will be incorporated into the process as needed.


Current policy initiative status

	2024				
	Q1	Q2	Q3	Q4	
EDAM	Implementation activities				
Gas Resource Management	Working groups	Discussion paper	Issue paper	Straw Proposal	
Greenhouse Gas Coordination		Working groups		Action plan Issue Paper	
Inter-SC Trades in Regional Markets			Straw proposal Final prosal	Decision	
Penalty Enhancements: Demand		Strow proposal	Final proposal	Inclosentation	
Response, Investigation, and Tolling			Decision	implementation	
Policy Catalog & Roadmap	Working groups		Final Catalog	Final Roadmap	



Pre-proposal development	
Proposal development	
Decision	
Implementation	

Current policy initiative status

	2024			
	Q1	Q2	Q3	Q4
Price Formation Enhancements	Working groups		Discussion paper	Working groups for Straw Proposal Development
Rules for Bidding Above Soft		Straw proposal Final Proposal	Inclosed	
Offer Cap		Decision	Implementation	
Storage Bid Cost Recovery & Default			Straw proposal	Final proposal
Energy Bids Enhancements			Straw proposal	Decision
WEIM Resource Sufficiency Evaluation Enhancements		Phase 2 implementation enhancements		Phase 3 issue paper
Resource Adequacy Modeling and Program Design	Working groups	Discussion papers	Issue paper	Straw proposals
Transmission Services and Market Scheduling Priorities	Manual implementation activities	Discussion papers		



Pre-proposal development Proposal development Decision Implementation Release Plan Update

Trang Vo Release Manager, Project Management



Release Plan Summary

Fall 2024 Settlements Release (No Projects)

Independent 2024 Releases

FERC 2222 – Distributed Curtailment Resources Application Delivery Resiliency – URL & IP Changes (& AUP Changes) Transmission Service & Market Scheduling Priorities Phase 2 – Resale Scope* FERC 2023 – Generator Interconnection Life Cycle Congestion Revenue Rights System Upgrade Highest Emergency Rating WEIM FAB Enhancements Hybrid Resources Phase 2C – RIMS* Transmission Exchange Agreement FERC 881 – Managing Transmission Line Ratings Track 2 – Operational/EMS Model Data & Applications* Enable Non-Generating Resources to Participate in Inter-SC Trade Modification of Maximum Import Bid Price Hourly Energy Shaping Factor

Spring 2026 Release

Day-Ahead Market Enhancements Activation* Extended Day-Ahead Market Activation* EDAM ISO BAA Participation Rules Track A* EDAM Onboarding Pacificorp, BANC, PGE WEIM BHE Montana*

Future Release

Subscriber Participating Transmission Owner Model* Settlement Upgrade Project – Next RUG/SUG quarterly update October 2024

*Policy California ISO

New: BRS Stakeholder Comments & Review Sessions

Stakeholders can now submit comments on Business Requirements Specifications

– BRS Comments open for:

Clo	osed	Open	Upcoming
•	Subscriber PTO thru 8/15/24 5PM PT FERC Order 2222 thru 8/9/24 5PM PT • Responses published EDAM ISO BAA Participation Rules v1.0- 1.1 thru 8/2/24 5PM PT	 DAME v1.3 thru 9/30/245PM PT EDAM v1.3 thru 9/30/245PM PT EDAM ISO BAA PR v1.2 - thru 10/9/245PM PT 	• EDAM ISO BAA PR v1.3

- Access from Release Planning at http://www.caiso.com/informed/Pages/ReleasePlanning/Default.aspx or access from Policy page
- ISO will schedule BRS reviews as appropriate
- Learn how to use the commenting tool:
 - View presentation
 - View video





Fall 2024 Settlements Release – No Projects



Fall 2024 Settlements Release

• Scope as of 9/4/24 Communication:

Fall 2024 Settlements Release C	omponent Summary
CHANGE SUMMARY	IMPACTS
FERC 2222 • FERC Order 2222 seeks to remove barriers for DCR (Distributed Curtailment Resources) participation in RTO/ISO markets. The CAISO will amend it's existing DER (Distributed Energy Resource) policy to accommodate FERC 2222, which will include reducing the maximum capacity requirement and introducing a new DERA resource type with underlying DCR.	 No PRR required There are no configuration/formulation changes, hence no tech doc or PRR/BPM posting. For information only. Effective Start Date: 11/01/2024
COTP Loss • Defect: Apply losses for the California Oregon Transmission Project (COTP) scheduled into the California Independent System Operator Corporation (CAISO) Balancing Authority Area using COTP capacity made available by Pacific Gas and Electric Company (PG&E) and the Transmission Agency of Northern California (TANC) consistent with the CAISO Tariff. This is an enhancement to implement an amended LOA among TANC, PGAE, WAPA. Instead of using average Day-Ahead Nodal prices for all nodes that includes the intertie (TRCYCOTPISO), a five -year rolling average cost will be used as as alternative for comparison with an hourly MEAA – another agreement - price. The MEAA price is at the intertie TRCYPGAE and Apnode WAPAMEEA3_ON_ASR-APND.	 PRR 1583 For those with schedules tagged at the intertie TRCYCOTPISO, the CAISO shall accumulate daily each scheduling coordinator's portion of COTP losses on an hourly basis and invoice each scheduling coordinator per payment calendar. Effective Start Date: 11/01/2024
RC Config Change • Defect: Issue with multiple BAA for Minimum RC Charge Flag. BA_RC_SVCS_NLOAD_TOP_MTH_EXMPT_FLAG has reference date "S" and needs to be updated to "T" to correctly be included in RC Settlement runs.	 No PRR required There are no configuration/formulation changes, hence no PRR/BPM posting. Updates is to reflect CAISO internal processing to ensure data is captured correctly. Effective Start Date: 11/01/2024
 RAAIM LESR change Defect: Revise the Generic Availability and Flexible Obligation calculations for Limited Energy Storage Resources (LESR) RA resources. Consistent with how generic obligation award is computed only for positive capacity, the generic availability will recognize only bids/availability for the capacity above zero. Conversely, since flexible obligation award allows for the full range – from negative Pmin to positive Pmax – the flexible obligation assessment shall recognize the negative capacity values, particularly for NGRs which can operate in the negative range. 	 PRR 1584 This will directly impact non-generating resources (NGR) and LESR generic availability calculation and flexible obligation assessment. More likely, as a result of these resettlement, the other resources (non-NGRs, traditional generators and supply resources) may have more or less adjustments in the incentives they settled previously. The generic issue only occurs when the NGR resources has outage on its positive capacity. The flexible issue more likely will be a charge to NGRs for those with penalties, a slight uptick in incentives if they were previously getting incentives, and a likely net effect to non-NGRs to be an increase incentives. Effective Start Date: 3/1/2023. This is retrospective going as far back at T+21M.

Fall 2024 Settlements Release (continued)

• Scope as of 9/4/24 Communication:

Fall 2024 Settlements Release Component Summary				
CHANGE SUMMARY	IMPACTS			
RMR • Defect: Fix a typo in BD with impact to CC 6470 design template. Typo correction will allow an RMR specific daily amount to be consumed by 7020 correctly.	 No PRR required There are no configuration/formulation changes, hence no PRR/BPM posting. Update is for typo error clean-up only. Effective Start Date: 11/1/2024. 			
BD Name Alias Change • Defect: Hierarchy Charge Names with Discrepant BILL_DETERMINANT_NAME & BILL_DETERMINANT_ALIAS Values. The BILL_DETERMINANT and ALIAS columns should be exact matches except that the enumeration in the BILL_DETERMINANT column should have an '@' sign in the name. The ALIAS enumeration will have an '_' (underscore) in the same position. As long as we do not plan to recalc the BD for any trade dates in the past that have calculated using the previous spelling in the enumeration column we can make the change prospective without causing calculation errors going forward.	 No PRR required There are no configuration/formulation changes, hence no PRR/BPM posting. No financial impact because the impacted BDs (some PTB BDs) were never used. Effective Start Date: 11/1/2024. 			
T vs. S: • Defect: Some Bill Determinants need to be updated from reference date "S" to "T" to align with best business practices. During review there were three bill determinants that had a different reference date than expected. While no settlements issues have been reported, to align the bill determinants with best practices, they will be updated prospectively. The following are the bill determinants impacted. RSRC_DAILY_APPLY_WHSL_CHG_FLAG, RSRC_DAILY_NGR_VER_FLAG, BA_5M_RSRC_TIE_DEV_EXEMPT_FLAG.	 No PRR required There are no configuration/formulation changes, hence no PRR/BPM posting. Updates is to reflect CAISO internal processing to ensure data is captured correctly. Effective Start Date: 11/1/2024. 			
TSMSP2: • When updates (with a 6/1/2024 Effective Date) associated with the TSMSP2 project were released to Production with the Summer 2024 Release a defect discovered that entities with ATC Reservations are seeing a doubling of the export quantities associated with that intertie. This occurred because the PriorityWheelThruPosition payload (which provides the ATC PWT Reservation Quantity derived in WebWheel) provides the CONTRACTRIGHT_MRID attribute and the DReAMS and MSDC team had believed this to be a renaming of the CONTRACT_REF_ID which we were expecting in existing configurations. This is causing conflicts with existing business drivers and leads to inaccurate calculations.	 PRR 1585 A change is required to sum over this conflicting attribute in the configuration so that it not cause conflicts. Its purpose is informational and summing over it will not impact calculations. Effective Start Date: 6/1/2024. 			



Draft of 2024 Fall Settlements Release Milestones

Release Milestones:

- \checkmark 1st draft config output file + release component summary posted: 8/13/24
- ✓ PRR/BPM posting: 8/27/24
- ✓ 2nd draft config output file + revised release component summary posted: 9/4/24
- Market sim/sample statement window: 9/16 10/14
 - Active in MAPSTAGE as of TD 8/1/24
 - Unstructured Sample Settlements Statements for Tuesday & Thursday TDs 9/17/24 thru 10/10/24
 - First Sample Settlement TD is 9/17/24, to publish 9/24 for Daily Initial
- Pre-prod configuration output file + release artifact revisions targeting: 10/23
- Anticipated prod activation effective trade date: **11/1**



Independent 2024 Releases



2024 – FERC 2222 – Distributed Curtailment Resources

Project Information

FERC Order 2222 seeks to remove barriers for DCR (Distributed Curtailment Resources) participation in RTO/ISO markets. Through its prior initiatives, CAISO already supports DER (Distributed Energy Resource) market participation. In this implementation, the CAISO will amend its existing DER policy to accommodate FERC Order 2222, which will include reducing the maximum capacity requirement and introducing a new DERA resource type with underlying DCR. In total, FERC Order 2222 requires RTOs/ISOs to revise the Tariff to establish a DERA participation model, which will:

- 1) Allow DERAs to participate in markets and establish DERAs as a type of market participant,
- 2) allow aggregators to register operational characteristics of a DERA,
- 3) establish maximum capacity requirements for DERAs,
- 4) address locational requirements,
- 5) address distribution and bidding,
- 6) address data and information,
- 7) allow for coordination between necessary entities,
- 8) address metering and telemetry,
- 9) address modifications to the list of resources in DERA, and
- 10) address market participation agreements.

The CAISO and its participating transmission owners have already gone to great lengths to ensure that DERs can easily access the wholesale markets for energy and ancillary services. These include ensuring that the CAISO does not prohibit any particular DER from participating in DERAs. This implementation now builds on this work by adding the DCR as an underlying resource type for the Distributed Energy Resource Aggregate (DERA). DERAs with any underlying DCR will be considered HDERA (given its capability to support both DER and DCR types) as opposed to the existing DERA (which only allow s underlying DER). Demand response is considered a type of DCR in this context. Similarly, as with demand response, the metering performance of DCRs will be reflected as supply (or metering channel 4).

The existing CAISO Tariff already complies with most of FERC Order 2222; how ever, a few changes will be needed to align the tariff with the order by including a new resource classification, reducing the minimum allow able DER energy nameplate capacity limit (i.e. Pmax), and the creation of DCRs. Some of these changes will include:

1) Adapt small utility opt-in provision in its pro forma Demand Response Provider agreement for the CAISO's pro forma DERP Agreement, replacing Demand Response references with DER references.

- 2) Change definition of DER to align with the Commission's definition as found in section III B of the Order No. 2222 DERAs Compliance Filing.
- 3) CAISO proposes to implement a heterogeneous DERA model such that:
 - "Heterogeneous" DERAs must consist of at least one curtailment resource, and may comprise of the aggregate's underlying capacity in part or total. - Heterogeneous DERAs will provide a net response of energy, demand curtailment or both at its PNode(s). Settlements for heterogeneous DERAs will
 - be based on the net service provided to the CAISO. This will be a sum of the net energy and the demand curtailment provided by the aggregate.
- 4) Define "Distributed Curtailment Resource" as a DER providing demand curtailment in a heterogeneous DERA.
- 5) Settle heterogeneous DERAs as a single supply resource, as a sum of net energy provided by DERs and the demand curtailed from DCRs.

6) The CAISO will apply a net benefits test to determine a threshold Market Clearing Price for Demand Response Providers and the new HDERA resource type. 7) Provision against double counting for any possible future scenarios, prevents a DER from participating in a DERA where the DER already participates in a retail net energy metering program that does not expressly permit wholesale market participation, requiring the distribution company to confer regarding any double-counting concerns

8) Reduce the minimum aggregate capacity limit of DERs from 500kW to 100kW for a DERA.

9) Revise Tariff to require DERPs to notify the CAISO whenever DERA information changes due to the removal, addition or modification of a DER within a DERA.



2024 – FERC 2222 – Distributed Curtailment Resources

Project Information	Details/Date
Description	The proposed changes amend the CAISO's Tariffto comply with FERC Order 2222. FERC Order 2222 requires that all RTOs/ISOs all ow for Distributed Curtailment Resources (DCRs) that can provide a minimum qualified aggregate Pmax value of at least 100kW to participate in all markets. The CAISO already allows for DER participation but will have to make some adjustments to ensure compliance with FERC 2222. Key Notes: • Reduces DERA and HDERA minimum participation capacity to 100kW • Introduction of HDERA Resource, aggregate with underlying DCR • Settlements for HDERAs • Same Net Benefitstesting as PDR for HDERAs
Scope	 RIMS add new Interconnection Customer display to process HDERA/DERA resource project details during NRI; change Pmax limit from 500 kW to 100 kW Master File GRDT, API Web Service update to accommodate HDERA_YN flag, + HDERA/DERA attributes receive (read-only, may only submit HDERA MF data through Concurrence Letter Attachment A submission and successful NRI process) SIBR enhancements to recognize HDERA resources, apply them to NBT with PDR prices, update rules to allow hourly GDF submission with bids IFM/RTM markets will model HDERA asgeneric NGR with NREM MRI-S extension of meter submission support for HDERA resources Settlements will configure HDERA charges and payments to settle as generic NGR with NREM (no new charge codes) Process Only (no system impact): Internal ISO process will track HDERA SQMD and monitoring data submission to ensure complian ce; ISO will contact SCs with delinquent submissions
BPM	 Definitions and Acronyms: Include HDERA, DCR terms Demand Response: Elaboration of net benefit testing Distributed Generation for Deliverability: Addition of the HDERA resource type. Generator Management: Inclusion of DCR in DERPAs, Schedule 1, and Concurrence Letter A template (add HDERA language) Market Instruments: Revision to minimum allowed Pmax limit; and HDERA (aggregate includesboth DER and DCR child units, models as an aggregate generic NGR, bidshave NBT applied, may submit GDFs with bidselse default used) Market Operations: Revision to minimum allowed Pmax limit; and HDERA (aggregate includesboth DER and DCR child units, models as an aggregate generic NGR, bidshave NBT applied, may submit GDFs with bidselse default used) Metering: New HDERA resource type includesnet energy meter submission for DERA, as well asmonitoring requirement data from DCR and underlying consumption/energy data used with metering basisfor baseline determination); HDERA monitoring Settlements and Billing: Impactson settlementsfor HDERAs
Tariff Changes	§ 4.17.7 § 11.6.5.1 § 30.5.2.6 § 4.6.3.2 (existing) Appdx K: A 1.1 B 1.1 C 1.1 (existing)
Impacted Systems	RIMS, Master File, SIBR, MRI-S, Settlements Page 19

2024 – FERC 2222 – Distributed Curtailment Resources

Milestone Type	Milestone Name	Dates	Status
Tariff	FERC Filing ER21-2455	Jul 19, 2021	\checkmark
	FERC Filing ER21-2455 Amend Effective Date NLT Nov 01, 2024	Aug 15, 2022	\checkmark
	FERC Order Accepting ER 21-2455	May 18, 2023	\checkmark
BRS	Publish BRS 1.2 BRS <u>comment</u> period open thru Aug 09, 2024 05:00 pm (PT) Responses to BRS Comments published	Jul 01, 2024 Closed Sep 09, 2024	\checkmark
Tech Spec	MF Generator RDT v6: Add HDERA flag and baseline methodology attributes (read-only): Validation: values must be read-only; cannot be submitted via: Generator RDT excel template or SubmitGeneratorRDT_MFRD SubmitGeneratorRDT_MFRD_DocAttach RDT Definitions Draft	Aug 08, 2024 Aug 16, 2024	√
ВРМ	Definitions and Acronyms Demand Response PRR 1588 Distributed Generation for Deliverability– Not applicable Generator Management Market Instruments PRR 1586 Market Operations Metering– Not applicable Settlements and Billing– Not applicable	Yes Aug 23, 2024 NA Yes Aug 21, 2024 Yes NA NA	✓ NA ✓ NA
Operating Procedures	5330 – Resource Testing Guidelines	Yes	
Training	Training	Sep 12, 2024 9-10 AM PT	\checkmark
Market Simulation	Market Simulation Scenarios Market Simulation – Unstructured	Jul 22, 2024 Sep 16 – Oct 11, 2024	✓
Production	FERC 2222 – Distributed Curtailment Resources	Nov 01, 2024	



2024 - Application Delivery Resiliency: API Customer Transition & Cutover



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2024 – Transmission Service & Market Scheduling Priorities Phase 2

Project Information	Details
High Level Business Need	Presents a long-term, durable framew ork to establish w heeling through scheduling priorities in the ISO markets that can further evolve with operational experience. It does not focus on, nor does it change, the processes for w heeling out or exporting from the ISO BAA. This project introduces a design to identify Available Transfer Capability (ATC) that can be allocated to Priority-Wheeling-Through (PWT) across the ISO system. This project also provides opportunity for external entities to drive transmission upgrades across the ISO system to support a w heeling-through. Will result in updates to the Wheel Export Quantity PC. The Original Wheeling Priority SC should be charged WAC for the Maximum of Wheeling Priority Quantity and scheduled export. If a resale should occur the purchaser of the resale Wheeling Priority SW and zero.
High Level Project Scope	 The following are the key design elements for Priority-Wheeling-Through (PWT): Calculating PWT Available Transfer Capability (ATC) Aw arding PWT ATC to PWT Requests Using PWT Aw ards in Market Operations Settling PWT Aw ards and Schedules Transmission Planning for PWT Capacity
BPM Changes	 Market Instruments – MF & SIBR Changes Market Operations – ITS, DAM, RTM Changes Reliability Requirements – Internal System Changes Settlements and Billing – Settlements Changes Transmission Planning Process – Impact for long term ATC Generator Interconnection and Deliverability Allocation Procedures – Impact for long term ATC
Tariff Changes	 §23.1, §23.2, §23.3, §23.4, §23.5, §23.6, §23.7 §26.1.4.5 §30.5.1 §34.12.3 §Appendix A §Appendix L §Appendix DD § New Appendix GG Long-Term Transmission Service & Market Scheduling Priorities
Impacted Systems	 AIM CIRA MF New system for ATC calculation, access, and reservation SIBR RTM Settlements OA SIS RIMS

2024 – Transmission Service & Market Scheduling Priorities Phase 2

Milestone	Milestone Name	Dates	Status
Board Approval	Obtain Board of Governors Approval	Feb 01, 2023	\checkmark
Extornal RDS	Post External BRS	Jan 31, 2024	\checkmark
External DNS	Post External BRS – Resale Scope	Sep 20, 2024	
Settlements	Tech Doc	Feb 12, 2024	\checkmark
Config Guides	1 st Draft Config File & Release Component Summary	March 4, 2024	\checkmark
Tech Spec	Create ISO Interface Specifications – OASIS	Jan 12, 2024	\checkmark
Tech Spec	Create ISO Interface Specifications – OASIS	Sep 2024	
	Filed ER23-2510 for Wheeling Through	Jul 28, 2023	\checkmark
	FERC Acceptance of ER 23-2510 (calculation of available transfer capability (ATC) and the process for establishing	Oct 30, 2023	\checkmark
	market scheduling priority for wheeling through the ISO transmission system)		
	Compliance Filing	Nov 29, 2023	\checkmark
Tariff	Petition for Limited Waiver for resale or assignment of monthly Wheeling Through Priority	Apr 12, 2024	\checkmark
Tahin	Order Granting Petition for Limited Waiver ER 23-2510 NLT Dec 17, 2024	Jul 08, 2024	\checkmark
	Track 2 DTL	Jul 14, 2023	\checkmark
	Track 2 Revised DTL	Oct 05, 2023	\checkmark
	Track 2 Final DTL	Dec 19, 2023	\checkmark
	Draft BPM changes – Market Instruments (PRR1558)	Mar 20, 2024	\checkmark
	Draft BPM changes – Market Operations (PRR1548)	Jan 16, 2024	\checkmark
	Draft BPM changes – Market Operations (Automation) (PRR 1570)	Apr 19, 2024	\checkmark
BPMs	Draft BPM changes – Reliability Requirements		
	Draft BPM changes – Settlements and Billing (PRR1560)	Mar 20, 2024	\checkmark
	Draft BPM changes – Transmission Planning Process		
	Draft BPM changes – Generator Interconnection and Deliverability Allocation Procedures		
Market Sim	Market Simulation – Resale Scope	Oct 07 – Oct 21, 2024	
	Implementation of wheeling through priority process supports load service planning for Summer 2024		
	ISO begin implementation thru manual processes		
	- Publication of Monthly ATC values for June 2024 to January 2025 (13-month horizon)	Jan 16, 2024	√
	- Request window opened (Submit via CIDI)	Jan 18 – Jan 31, 2024	√
	- Results communicated	Feb 5, 2024	\checkmark
	Monthly Scope: New automation functionality available to support reservation of Monthly and Daily ATC in June 2024	Apr 19, 2024	~
Production	and beyond		
Activation			,
	Daily Scope: Transmission Service & Market Scheduling Priorities Phase 2 – Activate daily and long-term increment	May 24 for Jun 01, 2024	\checkmark
	calculations		
	Resale Scone: Resale or Assignment of Monthly Wheeling Through Priority	Oct 31 2024	
	Nesale Scope. Nesale of Assignment of Wonting Wheeling Through Fridity	001 31, 2024	
	OASIS FTC. Data	2024	
		2021	
	2024 Monthly Wheeling Through Priority Request Due Dates		

FERC 2023 – Generator Interconnection Life Cycle

Project Information	Details/Date
High Level Business Problem or Need	Effective with Cluster 15, the Generation Interconnection process will transition to maintain compliance with FERC Order 2023 using a new cloud platform from Grid Unity. This mandate will streamline the intake, study processes for generator interconnection requests, contracting and management of the queue.
High Level Project Scope	 Align the following Cluster 15 Generation Interconnection processes with FERC Order 2023 tariff provisions: Enhanced interconnection information for public access (Interactive Heatmap, Cluster Study Status Report) Transition from GIDAP to new RIS Interconnection Procedures Initiate IR submission, Customer Engagement Window, Cluster Request Window Cluster 14 and prior will initially remain in RIMS but will migrate to GridUnity next year
BPM Changes	Definitions and Acronyms (new) Resource Interconnection Standards (applies Tariff Appendix KK procedures) Generator Interconnection Procedures Generator Management Transmission Planning Process
Tariff Changes	Section 25: 25.1, 25.4, 25.5 Appendices A, B.23 (removed), DD, KK (new), LL (LGIA), MM (SGIA)
Impacted Systems	RIMS, Market Participant Portal, CAISO Public Website



FERC 2023 – Generator Interconnection Life Cycle

Milestone Type	Milestone Name	Dates	Status
Policy	FERC Order 2023 is a mandate, but the project will additionally implement scope from the Interconnection Process Enhancements (IPE) 2023 initiative.	NA	NA
Board Approval	FERC Order 2023 compliance filing does not require Board approval. IPE 2023 Track 1 and 2 have been approved by the Board.	NA	NA
BRS	No BRS will be provided. Effective with Cluster 15, business processes shall align with the new Resource Interconnection Standards per FERC Order No. 2023 (ER24-2042). This will be implemented in a new cloud-based platform – Grid Resource Interconnection Portal (GRIP), This is separate from RIMS, which will initially remain to administer procedures for Cluster 14 and back. During the Resource Interconnection Standards Fair, stakeholders will receive training on FERC Order 2023 compliance and procedures as performed in the new GRIP.	NA	NA
Settlements Config Guides	Settlements Config Guides	NA	NA
Tech Spec	Publish Technical Specifications	NA	NA
Tariff	File Tariff Amendment – Interconnection Process Enhancements 2024 (ER24-2671)	Aug 01, 2024	✓
	Compliance Filing regarding FERC Order No. 2023 (ER24-2042)	May 16, 2024	×
BPMs	Post Draft - Definitions and Acronyms Post Draft - Resource Interconnection Standards (applies Tariff Appendix KK procedures) – Post Draft BPM – Generator Interconnection Procedure Post Draft BPM – Generator Management Post Draft BPM – Transmission Planning Process	TBD – Waiting for FERC Approval	
Training	Resource Interconnection Standards Fair	Sep 17, 2024	×
Production Activation	Production Activation will be delivered in alignment with the Cluster 15 Resource Interconnection Standards process within the following deliverables: - Cluster Application Window* - Cluster Study Process - Infrastructure Coordination *Note: CAISO will provide customers a 60-day period to input their interconnection request (versus the standard 15 days) to allow extra time to familiarize with the new GRIP.	Oct 01, 2024 (Cluster 15 Application Window Initiates) April 15, 2025 (Cluster Study Process Initiates) October 15, 2025 (Infrastructure Coordination Initiates)	

Project Information	Details/Date
	The Congestion Revenue Rights (CRR) system was implemented by CAISO in 2008 as part of the Market Redesign and Technology Upgrade (MRTU) implementation. The current CRR system is at its end of life, does not have the flexibility to accommodate future policy changes and requires the ISO to calculate data and run processes manually outside the current system to produce a successful CRR Auction.
	The CAISO has decided on a significant upgrade of the existing CRR system and adopt the latest technology stack aligned with CAISO's technology standards, consolidate all CRR related functions, minimize human errors, reduce processing time, eliminate manual workarounds, and positions the system to accommodate policy changes down the road.
High Level Project Scope	 Congestion Revenue Rights (CRR) system replacement project scope is the roll-out of a: Brand new user-interface (UI) system with an updated new look-and-feel, to replace the existing legacy system implemented during the MRTU 2008 go-live and brought up to current ISO technology standards Set of application-programming interfaces (APIs) to enable integration between ISO and market participant systems
	 Overall, to support the following in one consolidated CRR external-facing system: Annual/Monthly Auction and Allocation market participant bid submission and results retrieval Load data submission by CRR LSEs, CEC Load migration data submission by CRR UDCs Secured "Congestion Revenue Rights Full Network Model" information access Private and public access of CRR market input and output information
BPM Changes	 Congestion Revenue Rights Enhancements made to the new CRR product. Automatic publishing of CRR market results. Automatic CRR notification. New CRR schedule calendar. New CRR FNM access. New CRR data submission and download interface UI/API. New CRR market results interface. Load Migration
Tariff Change	No
Impacted Systems	CRR, AIM, CMRI, OASIS, CTS, Market Clearing, EMMS, IFM/RTN, MQS, Master File, MPP, Settlements, WebOMS, ETCC.
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System	High Level Changes
CRR	 Significant system upgrade including: Enhancements made to the new CRR application. Automatic publishing of CRR market results. Automatic CRR notification. New CRR schedule calendar. New CRR FNM access. New CRR data submission and dow nload interface UI/API. Other TBDs identified through BRS development.
AIM	New users and roles to support new CRR functionality
CMRI	 Full and incremental Payload publishing Publish CRR Aw ards payload on event-driven, ad-hoc or scheduled basis Publish CRR Aw ards payload on event-driven, ad-hoc or scheduled basis
OASIS	 Publish CRR Calendar, and all available CRR market names, and credit margin information, 3 year historical expected value Allow authorized users to publish CRR inventory payloads Broadcast the following: set aside values, the results of all CRR markets, retired pnode/anode mapping, binding constraints, initial and updated CRR source and sink list for each CRR market,
стѕ	Broadcast
EMMS	CRR will consume data from EMMS
IFM/RTN	CRR will consume data from IFW/RTN
MQS	 MQS will consume and process SCID in a new format MQS will consume ow nership payload in bulk
Master File	Master File will be modified as needed to support the new CRR functionality
MPP	CRR will provide pre-configured external reports
Settlement	Settlements will be modified as needed to support the new CRR functionality
WebOMS	CRR will consume data from WebOMS
ETCC	CRR will consume data from ETCC



Milestone Type	Milestone Name	Dates	Status
Board Approval	Obtain Board of Governors Approval	NA	
External BRS	Publish External BRS BRS Revision v1.3	Nov 16, 2022 Mar 29, 2023	√ √
Config Guides	Post Draft Config Guides	Yes	
Tech Spec	Publish Technical Specification	Feb 24, 2023	~
Deployment Plan	Draft Deployment Plan	Yes	
Training	Training	Yes	
Customer Partnership Group	Last CPG Next CPG	Aug 22, 2024 Sep 26, 2024	✓



Updated Aug 2024

- Functional Site Acceptance Testing, B2B integration and security testing continues
- Connectivity Testing 1 week after above testing, starting in late October, just before Market SIM
- Training 1 week before Market SIM in late October
- Market SIM 2 week structured, then 3 week unstructured starting in early November
- 2025 Annual Cycle, carried out in 2024, will occur on the current Production CRR application
- 1 week Cutover to new CRR application 1/27/25 to 1/30/25- 2025
- March is first month with processes fully on the new system



2024 - CRR System Upgrade – Get Connected

- CRR meetings:
 - Bi-weekly Technical User Group (TUG) Tue 10 AM, alternates with RUG.
 - Meetings available on the CAISO calendar on <u>www.caiso.com</u>
 - Meeting details and presentation materials are available on the CAISO Developer site at <u>www.developer.caiso.com</u>, which requires an account to be setup for access
 - CRR Customer Partnership Group
 - Last CPG Aug 22, 2024; <u>recording available</u>
 - Next CPG meeting is Thursday, Sep 22, 2024
 - Monthly
 - Meetings available on the CAISO calendar on <u>www.caiso.com</u>
 - Meeting details and presentation materials are available on <u>https://www.caiso.com/meetings-events/topics/congestion-revenue-</u> <u>rights-crr-settlement-upgrade-project-customer-partnership-group</u>



- Calendar layout of proposed CRR monthly and Annual Market Sim plan
- DRAFT CRR 2024 & 2025 Allocation and Auction Markets Calendar



	Ν	Market Sim 20)24	
MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
 week 1 T-2w - Connectivity Prior to Market Sim - Kickoff and Overview Market Sim Plan High level overview of new system Uploading and Downloading Manual Entry, File Upload, API Public/Private Downloads Messages Sorting and Filtering Documentation and Resources Contact Information data setup of multiple markets 	Allocation Monthly Participants • Submit Nominations for Tier 1 Monthly Market (dummy MEQ) • Windows Close on Wednesday • Submit Historical/Forecast Load • Download Nomination Cap data • Download Allocation Market Results Market Sim Webex	Auction Monthly Participants • Submit Auction Portfolios Monthly Auction Market • Buy Bids, Sell Offers • Credit - provide \$10mil to all MPs for testing • Windows Close on Thursday • Download Auction Market Results Market Sim Webex	Miscellaneous Monthly process UDC Load Migration Submissions CEC Load Forecast Submissions LT Re-nomination Secondary Market MT_TOR CRR Approvals Market Sim Webex 3-4pm PST	Reserved for CRR team data processing and participant responses Environment Patching
week 2 Reserved for CRR team data processing and participant responses CRR team setup for Monthly Mini Auction	Allocation Annual Participants Submit Nominations for Tier 1 Annual Market (dummy SEQ/UB/Signature Pair) Market Sim Webex	Auction Annual Participants • Submit Auction Portfolios Annual Auction Market • Buy Bids, Sell Offers • Credit - provide \$10mil to all MPs for testing • Re-submit for any processes or scenarios which had issues previously	 Miscellaneous Annual process Submit Auction Portfolios for Participant requested scenarios View results from Week 1 submissions Market Sim Webex 	Reserved for Q&A sessions, issue reporting, etc. Environment Patching

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Market Sim 2024									
MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY					
week 3									
Unstructured Week 1	 Re-submit for any process of scenarios for customer specific testing 	Unstructured	Unstructured	Reserved for CRR team data processing and participant responses Environment Patching					
	Market Sim Webex		Market Sim Webex						
week 4 Unstructured Week 2	Unstructured	Unstructured	Unstructured	Reserved for CRR team data processing and participant responses					
		Market Sim Webex		Environment Patching					
week 5	Unstructured Cont.	Unstructured Cont.	Unstructured Cont.	Reserved for CRR team data processing and participant responses					
			Market Sim Webex	Environment Patching					

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November 2024									
MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY					
Annual	December January Market Sim/Cute	over		1 2025 Auction Open					
4 Dec List of outages post by 5P Post January Source/Sink List 2025 Auction Closes 5P	S Dec Incr. Update by 5P	6	7 Dec Tier 1 Opens 1A Dec Tier 1 Closes 5P Jan <u>Hist</u> Load Wind Opens 1A Jan <u>Hist</u> Load Wind Closes 5P	8 Jan <u>Frest</u> Load Wind Opens 1A					
	Market Sim – Week 1	Market Sim – Week 1	Market Sim – Week 1	Market Sim – Week 1					
11 Dec Post Tier 1 Results by 5P Post 2025 Auction Results by 5P Jan Frest Load Wind Closes 5P	12 Dec Post Set-Aside Dec Tier 2 MEQ Market Sim – Week 2	13 Dec Tier 2 Opens 1A Dec Tier 2 Closes 5P Market Sim – Week 2	14 Market Sim – Week 2	15 Dec Post Tier 2 Results by 5P Market Sim – Week 2					
18	19 Dec Auction Opens 1A Market Sim – Week 3	20 Dec Auction Closes 5P Dec UDCs submit LM data by 12P Market Sim – Week 3	21 Market Sim – Week 3	22 Dec Auction results post by 5P Market Sim – Week 3					
25 Jan Post CRR FNM by SP Market Sim – Week 3	26 Market Sim – Week 3	27 Jan Post MEQ Market Sim – Week 3	28 Holiday [Thanksgiving]	29 Holiday (Thanksgiving)					

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December 2024								
MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY				
2 Post February Source/Sink List	3	4	5	6 Jan List of outages post by SP				
	Market Sim – Week 4	Market Sim – Week 4	Market Sim – Week 4					
9 Feb <u>Hist</u> Load Wind Opens 1A Feb <u>Hist</u> Load Wind Closes 5P	10 Jan Incr. Update by 5P Feb Forecast Load Wind Open 1A	11 Feb Forecast Load Wind Closes 5P	12 Jan Tier 1 Opens 1A Jan Tier 1 Closes 5P	13 Jan Post Tier 1 Results by 5P				
	Market Sim – Week 5	Market Sim – Week 5	Market Sim – Week 5					
16 Jan Post Set-Aside Jan Tier 2 MEQ	17 Jan Tier 2 Opens 1A Jan Tier 2 Closes 5P	18	19 Jan Post Tier 2 Results by 5P	20 Jan UDCs submit LM data by 12P				
23 Jan Auction Opens 1A	24 Jan Auction Closes SP	25	26 Feb Post CRR FNM by 5P	27 Jan Auction results post by 5P				
30 Feb Post MEQ	31			January February Market Sim/Cutover				

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	January 2025								
	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY				
	February March		Sebruary 1 2 March 1 2 Holiday New Year's Day)		3 Feb List of outages post by 5P				
	Market Sim/Cu	tover							
6 Pos	6 7 Post March Source/Sink List Feb Incr. Update by 5P		8 Mar <u>Hist</u> Load Wind Opens 1A Mar <u>Hist</u> Load Wind Closes 5P (Entered in current system, will be migrated to new System)	9 Feb Tier 1 Opens 1A Feb Tier 1 Closes 5P Mar <u>Frest</u> Load Wind Opens 1A	10 Mar Frest Load Wind Closes 5P				
13 Feb	13 14 Feb Post Tier 1 Results by 5P Feb Post Set-Aside Feb Tier 2 MEQ		15 Feb Tier 2 Opens 1A Feb Tier 2 Closes 5P	16	17 Feb UDCs submit LM data by 12P Feb Post Tier 2 Results by 5P				
20	Holiday (Martin Luther King's B-Day)	21	22 Feb Auction Opens 1A	23 Feb Auction Closes 5P	24				
27 Feb	27 Feb Auction results post by 5P 28 Mar Post CRR FNM by 5P – on SFTP site		29	30	31				
		Production Deployment –Phase 1 cutover	Production Deployment –Phase 1 cutover	Production Deployment –Phase 1 cutover	Production Deployment – Phase 1 cutover Complete				



February 2025									
MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY					
March									
April									
3 New System Online Mar Post MEQ Post April Source/Sink List	4	5 Apr CEC Load Wind Opens 1A Apr CEC Load Wind Closes 5P	6 Mar List of outages post by 5P Mar Incr. Update by 5P Apr <u>Hist</u> Load Wind Opens 1A Apr <u>Hist</u> Load Wind Closes 5P	7 Mar Tier 1 Opens 1A Mar Tier 1 Closes 5P Apr <u>Frest</u> Load Wind Opens 1A					
10 Apr <u>Frest</u> Load Wind Closes 5P	11 Mar Post Tier 1 Results by 5P	12 Mar Post Set-Aside Mar Tier 2 MEQ	13 Mar Tier 2 Opens 1A Mar Tier 2 Closes 5P	14					
17 Holiday (Presidents Day)	18 Mar Post Tier 2 Results by 5P	19	20 Mar UDCs submit LM data by 12P Mar Auction Opens 1A	21 Mar Auction Closes 5P Apr Post CRR FNM by 5P					
24	25 Mar Auction results post by 5P	26 Apr Post MEQ	27	28					

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2024 – Highest Emergency Rating

Project Information	Details/Date							
High Level Business Problem or Need	The project ai updating func functionality e	The project aims to primarily improve market robustness, performance, and the technology foundation for system grid reliability by updating functionality and interfaces to reduce workarounds, automating manual processes and addressing minor defects or functionality enhancements identified in by the business units.						
High Level Project Scope	 This enhancement focuses specifically on internal ISO users and RC Customers having the capability to adjust the HER and ER duration in OMS. Step 1 – HER data cleanup Load HER in EMMS in one of the existing slots Transfer HER to RTCA during the network model build process Step 2 – Use RTCA to update HER For interim changes to HER in between models, change the data directly in RTCA Make the ER and HER duration and value fields editable Include validation to make sure HER is not less than the emergency rating Step 3 – WebOMS changes Work with OATI to include a new field for HER HER can be updated in WebOMS in between model promotions Updates to HER will be sent to downstream systems 							
BPM Changes	Not Impacted							
Tariff Changes	Not Impacted							
Impacted Systems	webOMS, HA	NA, Market						
Milestone Type		Mile stone Name	Dates	Status				
Board		Board	NA					
BRS		BRS BRS 1.1	Feb 15, 2024 Apr 10, 2024	\checkmark				
Tech Spec		Present OMS in TUGFeb 27, 2024OMSAug 19, 2024						
Training		Training	Late Oct					
Market Simulation		Market Simulation	Early Nov					
Production		Production	Q4 2024					



2024 - Highest Emergency Rating - OMS

- Three new fields will be added on the current OMS Derate User Interface and user will have capability to adjust the values through UI and API:
 - "Emergency Rating Duration" as integer, set in minutes.
 - "Highest Emergency Rating" as a numeric input.
 - "Highest Emergency Rating Duration" as integer, set in minutes.

Equipment Picker	Notes RIMS	_		- Equipment	t							
Voltage Level:		• •		Equipment	Station		Name	Voltage	Туре	Switch Modeli Complete	ing Use Facility Model	ID
Equipment Type: Equipment:		•				Use Facility M	lodel					
Station	Name	Voltage	Equipme	Switches	Station	Name	Voltage	Туре	Status	Start Date/Time Er	nd Date/Time ID	Is Trumped
				Equipment	t Rating Change	es						
				Nam	ne	Voltage	Normal Rating (MVA)	Seasonal Normal Rating	Emergency Rating (MVA)	Seasonal Emergency Ratir	ng Start Date/Time	End Date/Time
							E	mergency Rating	Duration	HER	HERIDI	iration

WebOMS will give validation error if below conditions are not satisfied:

Rating Limits and Durations are not defined for ERC.

Highest Emergency Rating is less than active Emergency Rating.

Highest Emergency Duration is greater than Emergency Rating Duration.

If HER Limit and Duration values are partially complete.

If user want to enter ER greater than the current HER then would first have to adjust HER then update ER.

- If neither HER Limit and Duration values are defined, system should auto-fill the HER Limit and Duration values to match their associated Emergency Rating Limit and Duration values.
- Emergency Rating (ERC) flows to Market, RTCA, and EMS; and HER only flows to RTCA, and EMS. WebOMS will display a pop-up notification on submitting the ERC or HER through UI,API akin to SUCCESS message
- There will be XSD update on below services :

SubmitTransmissionOutage_v3-Regular and DocAttach SubmitTransmissionOutageChangeRequest_v3-Regular and DocAttach RetrieveTransmissionOutage_v3 - Regular and DocAttach RetrieveTransmissionOutageChangeRequest_v3 - Regular and DocAttach.

2024 – WEIM Fab Enhancements

	Business Opportunity/Problem Statement:
What:	WEIM FAB Enhancements consist of three enhancements and one improvement. This project aims to improve RTM robustness, minimize Market Isolations, modernize tools for Support Control Center, provide accurate, accessible, and clear information to ensure customer preparedness and to deepen understanding about the reliability needs of the grid."
	WEIM Fab-Enhancements:
	 1) Congestion Management Full Transparency 2) Hourly Base ETSR Schedule Redundancy (project, RTM payload). Note: This item is being pursued as its own stand alone project. 3) External WEIM Commitment Override 4) Dynamic ETSR Limits – Safety Net 5) System Net ITC Definitions
Who does this opportunity/ problem impact:	WEIM entities, WEIM BA Operators (CAISO included), RTMO



2024 – WEIM Fab Enhancements: Congestion Management Transparency (Implemented June 2024)

Project Information	Details
High Level Business Problem or Need	 The Congestion Management Transparency enhancement seeks to provide WEIM entities with highly accurate, easily accessible, and transparent information to enhance customer preparedness and grid reliability visibility. ✓ This enhancement was implemented June 2024.
High Level Project Scope	 Currently, WEIM Operators can see their own flowgates and resources on the RTM UI but cannot see: 1) Why their resource(s) are being moved if it is for constraint(s) outside of their BAA, and 2) what resources outside of their BAA are being moved to mitigate their BAA's constraints. WEIM Operators must have the capability to see and select their BAA's resources that are impacted by congestion as well as others' resources they are impacting with congestion (even if outside of their BAA). This enhancement is for the following tables within the RTM UI: Congested Resources Table, Binding Transmission Constraints Flowgates, and Binding Transmission Constraints Nomograms. <i>Warning: "WEIM Operators are responsible for ensuring this information is handled within their own organizations consistent with FERC's Standards of Conduct for Transmission Providers. The CAISO is not requiring any additional attestations from WEIM Operators or imposing additional access controls within the BAAOP system."</i>
BPM Changes	Market Operations
Tariff Changes	N/A
Impacted Systems	Transmission Resource Congestion: RTM – RTD, RTPD, STUC Binding Transmission Constraints Flowgates: RTM – RTD, RTPD, STUC Binding Transmission Constraints Nomograms: RTM – RTD, RTPD, STUC



2024 – WEIM Fab Enhancements: Congestion Management Transparency Transmission Resource Congestion (Implemented June 2024)

IFM/RTN: Operations > Transmission > Resource Congestion BAAOP: EIM > Transmission > Resource Congestion *This requirement is for RTD/RTPD/STUC UIs*

The CAISO or WEIM entity should only be able to see their BAA's resources in the "Congested Resources" table (left side).

They should be able to select any resource from the left side table and on the "Constraints causing Congestion" table (right side) they should see any constraint in the system that is moving their resource, not just within their own BAA.

	EIM	Admin													
EIM Tr	ansmission	Input System NA	Coming Soon – Live Data												
EIM >	Transmissio	n 🔉 Resource Co	ngestion > RTD												
BAA [A	L] 🗸 Trad	e Date 02/26/2024	✓ Interval End [ALL] ✓	Shift Factor >	5	Status [ALL]	 Image: A set of the set of the					Apply	Reset	Pass RTD	~
▼ Co	ngested Reso	urces			v c	Constraints causi	ing Congestion								
÷. 🔻	7. Y M J	🗉 🖪 🔰 🖣 201	- 225 of 2480	0 1	÷.										
BAA	Interval End	A Resource Name	Total Concestion LMP	Pricing IS/MWI Status of Resource				NA Case							
	02/26/2024 13	50	\$0.00	30 100 On line	Const	traint Type 🔶 Cons	traint Name 🔶 ID 🔶 B	AA Name	Shadow Price Cor	nstraint Coeff Shift Fa	actor LMP Cong Comp				
	02/26/2024 13	50	\$0.00	30.100 On-Line	A EIM	TRANSFER			(\$0.00)	1.00	\$0.00				
	02/26/2024 13	50	50.00	30.100 Op.Line	FLOW	VGATE	0	Base Cas	e (\$73.91)	0.	999 (\$73.84)				
	02/26/2024 13	50	(\$73.84)	-43.740 On-Line 🥖											
-	02/26/2024 13	50	\$0.00	30.100 On-Line											
	02/26/2024 13	:50	\$0.00	30.100 On-Line											
	02/26/2024 13	:50	\$0.00	30.100 On-Line											
	02/26/2024 13	:50	\$0.00	30.100 On-Line											
	02/26/2024 13	:50	\$0.00	30.100 On-Line											
	02/26/2024 13	:50	\$0.00	30.100 On-Line											
	02/26/2024 13	:50	(\$0.00)	30.100 On-Line											
	02/26/2024 13	:50	\$0.00	30.100 On-Line											
	02/26/2024 13	:50	\$0.00	30.100 On-Line											
	02/26/2024 13	:50	\$0.00	30.100 On-Line											
	02/26/2024 13	:50	\$0.00	30.100 On-Line											
	02/26/2024 13	:50	\$0.00	30.100 On-Line											
	02/26/2024 13	:50	\$0.00	30.100 On-Line											
	02/26/2024 13	:50	\$0.00	30.100 On-Line											
	02/26/2024 13	:50	\$0.00	30.100 On-Line											
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2024 – WEIM Fab Enhancements: Congestion Management Transparency Binding Transmission Constraints Flowgates (Implemented June 2024)

IFM/RTN: Operations > Transmission > Binding Transmission Constraints - Flowgates

BAAOP: EIM > Transmission > Binding Transmission Constraints - Flowgates

This requirement is for RTD/RTPD/STUC UIs

In this UI, the CAISO or WEIM entity should only be able to see their BAA constraints in the "Binding Transmission Constraints - Flowgates" table (left side).

They should be able to select any constraint from the left side table and on the "Resource Participation" table (right side) they should see any resource in the system that is being moved due to congestion, not just resources within their own BAA.

* Add new column "BAA" to Resource Participation table

	EIM	Admin																			
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2024 – WEIM Fab Enhancements: Congestion Management Transparency Binding Transmission Constraints Nomograms (Implemented June 2024)

IFM/RTN: Operations > Transmission > Binding Transmission Constraints - Nomograms BAAOP: EIM > Transmission > Binding Transmission Constraints - Nomograms *This requirement is for RTD/RTPD/STUC UIs*

In this UI, the CAISO or WEIM entity should only be able to see their BAA Nomograms in the "Binding Transmission Constraints -Nomograms" table (left side).

They should be able to select any Nomogram from the left side table and on the "Resource Participation" table (right side) they should see any resource in the system that is being moved due to congestion, not just resources within their own BAA. * Add new column "BAA" to Resource Participation table

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								0.067	-0.0058	-11.6800	9.7200	9.0800	-0.6400	9.6502	9.0800						
								-0.032	0.0213	-1,4900	7.7100	6.3300	-1.3800	9.6497	6.3300						
								0.021	0.0213	0.9670	42.9800	45.0300	2.0500	0.0000	45.0300						
								0.224	0.3548	0.6310	15.4830	16.3310	0.8480		15.0200						
								4.696	0.3608	13.0160	32.5800	34.1630	1.5830		30.5100						
								-0.029	0.0390	-0.7350	107.2920	112.4680	5.1760		105.1000						
								-0.005	-0.0050	1.2630	7.5650	8.0000	0.4350	6.3625	6.9900						
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2024 – WEIM Fab Enhancements: External WEIM Commitment Override

Project Information	Details
High Level Business Problem or Need	 The External WEIM Commitment Override enhancement seeks to modernize WEIM operator tools for Support Control Center Operations as well as to enhance customer preparedness and grid reliability visibility. This enhancement is currently slated for 2024. Timeline updates to be provided in future meetings.
High Level Project Scope	 Currently, WEIM Operators call the RTMO to request the commitment override and RTMO enters the override into the RTM via BAAOP. RTMO do not have the authority to deny the request from the external WEIM entity. This enhancement shall provide WEIM Operators with the ability to enter WEIM Commitment Overrides directly in the RTM Market UI themselves. This enhancement applies to any WEIM BAA with existing access to RTM. Currently, no additional access provisioning or roles are required in AIM.
BPM Changes	MarketOperations
Tariff Changes	N/A
Impacted Systems	RTM - BAAOP

Market Simulation target October 2024

🍣 California ISO

2024 – WEIM Fab Enhancements: System NET ITC Definitions

Project Information	Details
High Level Business Problem or Need	 Currently, the System NET ITC Definitions are updated directly during new WEIM onboarding. As there are several existing WEIM entities that were onboarded prior to the addition of this business process the request is to update System NET ITC Definitions for existing WEIM entities. This enhancement is currently slated for 2024. Timeline updates to be provided in future meetings.
High Level Project Scope	 Internal ISO team to update System NET ITC Definitions for existing WEIM entities. This enhancement item is being disclosed for WEIM entities visibility purposes only. No action is required for this enhancement by WEIM entities at this time.
BPM Changes	N/A
Tariff Changes	N/A
Impacted Systems	MasterFile

ISO testing underway



2024 – WEIM Fab Enhancements: Dynamic ETSR Limits Safety Net

Project Information	Details
High Level Business Problem or Need	 The Dynamic ETSR Limits Safety Net seeks to resolve a known reliability issue for numerous WEIMs. This enhancement is currently slated for 2024. Timeline updates to be provided in future meetings.
High Level Project Scope	 This enhancement seeks to define and introduce a safety net in the event the Dynamic Limits Interface (DLI) has an issue with send/receive payload or null values in RTM. CAISO is actively scoping this enhancement to ensure WEIM alignment prior to proposing an agreed upon solution. This item shall be more thoroughly disclosed in future WEIM meetings.
BPM Changes	TBD
Tariff Changes	N/A
Impacted Systems	RTM - BAAOP



2024 – Hybrid Resources 2C RIMS

Project Information	Details/Date
High Level Business Problem or Need	 The ISO launched this stakeholder initiative to identify new or enhanced market rules and business processes needed to accommodate hybrid resources, resources that consist of two sets of market rule changes that will facilitate mixed-fuel type (hybrid and co-located resources) project participation in the ISO markets. Prior to this initiative, Phase 1 identified a first set of modifications generally concerned with setting up and operating co-located resources. Building on phase 1, Phase 2 focuses on modifications that will explore how hybrid generation resources can be registered and configured to operate within the ISO market. The initiative will further develop solutions allowing developers to maximize the benefits of their resource's configuration. Additionally, hybrid resource configurations also raise new operational and forecasting challenges that the ISO plans to address during this initiative.
High Level Project Scope	With this initiative, there's an opportunity to increase storage and the number of hybrid resources that can connect to the ISO grid. Currently the interconnection queue includes more than 24,000 MW of mixed fuel projects and nearly 20,000 MW of storage which represents roughly half of all generation in the current interconnection queue.
BPM Changes	Settlements & Billing
Impacted Systems	Summer 2023: Settlements Fall 2023: Metered Quantities for Hybrids Independent 2024: RIMS Completed: Today's Outlook, ISO Today Mobile Application, Reports
Requirements	http://www.caiso.com/Documents/BusinessRequirementsSpecifications-HybridResourcesPhase2.pdf

2024 – Hybrid Resources 2C RIMS

Milestone Type	Milestone Name	Dates	Statu <u>s</u>
External BRS	Publish External BRS Revision – Add 4 Market Simulation Business Requirements	Jan 31, 2023 Jan 04, 2024	\checkmark
Settlements Config Guides	NA for RIMS	NA	
Tech Spec	Create and Publish ISO Interface Spec (Tech Specs)	NA	
Market Sim	Market Sim Window – RIMS	Nov 2024	
Shapefile	Shapefile requirements and samples will be presented in future RUG & TUG forums	Q4 2024	
Production Activation	Hybrid Resources 2C – RIMS	Q4 2024	



2024 – Transmission Exchange Agreement

Project Information	Details/Date
High Level Business Problem or Need	The ISO is committed to develop a process or system that allows Western Area Power Administration – Sierra Nevada Region ("WAPA") to resell some or all of their 400 MW ownership rights on the PACI#1 line to other SCIDs and retain the perfect hedge and scheduling priority to further contract negotiations to extend the term of the Transmission Exchange Agreement. The Transmission Exchange Agreement ("TEA") with WAPA-SNR, PG&E and ISO is scheduled to expire 9/30/2024. A term of the original agreement executed in 2004, was that the ISO would develop a system that allowed WAPA to sell their unused capacity on their line. This project provides solution to the scheduling issue which needs to be in place by June 2024 to ensure that the ISO has solved the problem and support filing an amendment and extension of the TEA at FERC.
High Level Project Scope	 WAPA needs functionality to sell their TOR to other parties on their OASIS. If the TOR rights are sold then WAPA will notify the CAISO to provide the purchaser the hedging and scheduling priority opportunity provided all ETCs/TORs. The market and settlement systems need to be able to "move" the Contract Reference Number ("CRN") from the WAPA CRN to the purchaser SCIDs so that the settlement to the purchaser SCID reverses the costs of the transmission access charge and congestion (aka the perfect hedge) and provides a high scheduling priority in the IFM and RTM. WAPA will not take on the obligation to settle with their purchaser. WAPA can sell any increments of MWs up to their 400 MW ownership rights. Therefore, the solution needs to be flexible enough to allow the "existing" TORs to vary the MWs capabilities. [Note: The MW increments to be sold can be no less than 5 MW.] WAPA's functionality allows them to schedule between Malin and Round Mountain, Malin and PG&E DLAP, and Malin and Tracy. This would be the source and sink that that functionality needs to provide. If there are outages on the line, the curtailment should be consistent with current practice.
BPM Changes	Settlements Configuration Guides
Tariff Changes	N/A
Impacted Systems	AIM, MF, CMRI

2024 – Transmission Exchange Agreement

Milestone Type	Milestone Name	Dates	Status
External BRS	Post External BRS	Sep 03, 2024	\checkmark
BRS	Provide to WAPA	Jan 23, 2024	\checkmark
Settlements Config Guides	Tech Doc 1st Draft Config File & Release Component Summary	Feb 12, 2024 Mar 04, 2024	\checkmark
Tech Spec	Create ISO Interface Specifications – CMRI UI: The current CMRI CRN report is not being changed. WAPA will be able to see Sub CRNs mapped to its own Parent CRN	Mar 26, 2024	~
Tariff	NA	NA	
BPMs	Draft BPM changes – Settlements & Billing PRR 1559	Mar 20, 2024	\checkmark
Market Simulation	Market Simulation – WAPA	Feb 2025	
Production Activation	Transmission Exchange Agreement Renegotiation	твр	



Project Information	Details/Date			
	This initiative transmission	will address the California ISO's compliance with FERC line rating requirements	C Order No. 881 in establishing	g new
High Level Project Scope	Order No. 88 providers • Establish a excepted • Use • Use • RTOs/ISO update tran • Use unique	and use ambient-adjusted ratings and seasonal ratings f e AARs for near-term transmission service requests e seasonal rating for long-term transmission service request s must implement systems and procedures to allow transmission line ratings at least hourly elv determined emergency ratings for contingency analy	for public utility transmission for all transmission lines unless uests ismission owners to electronica	s ally
	post-contirImplement	ngency simulations of constraints transparency reform		
Mile stone Type	post-contirImplement	ngency simulations of constraints transparency reform Milestone Name	Dates	Status
Milestone Type Tariff	post-contir • Implement	ngency simulations of constraints transparency reform <u>Milestone Name</u> Draft Tariff Language	Dates May 20, 2022	Status √
Milestone Type Tariff	post-contirImplement	Analysis of the second general ratingeneral analysis of the second general analysis of the se	Dates May 20, 2022 Jun 23, 2022	Status ✓
Milestone Type Tariff	post-contirImplement	Analysis and geney ratinger for containinger of a marger of a marg	Dates May 20, 2022 Jun 23, 2022 Jun 16, 2022	Status ✓ ✓
Milestone Type Tariff	post-contir • Implement	Analysis and generating the contained and generating the contained and generating the contained and generating	Dates May 20, 2022 Jun 23, 2022 Jun 16, 2022 Apr 20, 2023	Status ✓ ✓ ✓
<u>Milestone Type</u> Tariff	post-contir • Implement	Ingency simulations of constraints Itransparency reform Milestone Name Draft Tariff Language Revised Draft Tariff Language FERC Filing ER22-2362 FERC Acceptance ER22-2362 FERC Acceptance Tariff Revisions	Dates May 20, 2022 Jun 23, 2022 Jun 16, 2022 Apr 20, 2023 Dec 13, 2023	Status ✓ ✓ ✓ ✓
Mile stone Type Tariff BRS	post-contir • Implement	Mile stone Name Draft Tariff Language Revised Draft Tariff Language FERC Filing ER22-2362 FERC Acceptance ER22-2362 FERC Acceptance Tariff Revisions Publish BRS – Track 1 Publish BRS – Track 1 Publish BRS – Track 2	Dates May 20, 2022 Jun 23, 2022 Jun 16, 2022 Apr 20, 2023 Dec 13, 2023 Jan 30, 2024 Jun 11, 2024 By end of Sep 2024	Status ✓ ✓ ✓ ✓ ✓ ✓ ✓
Mile stone Type Tariff BRS Market Simulation	post-contir • Implement	Mile stone Name Draft Tariff Language Revised Draft Tariff Language FERC Filing ER22-2362 FERC Acceptance ER22-2362 FERC Acceptance Tariff Revisions Publish BRS – Track 1 Publish BRS – Track 1 Publish BRS – Track 2 Market Simulation	Dates May 20, 2022 Jun 23, 2022 Jun 16, 2022 Apr 20, 2023 Dec 13, 2023 Jan 30, 2024 Jun 11, 2024 By end of Sep 2024 NA	Status ✓ ✓ ✓ ✓ ✓ ✓ ✓
Mile stone Type Tariff BRS Market Simulation Production	post-contir • Implement	Mile stone Name Draft Tariff Language Revised Draft Tariff Language FERC Filing ER22-2362 FERC Acceptance ER22-2362 FERC Acceptance Tariff Revisions Publish BRS – Track 1 Publish BRS – Track 1 (Updates & Added FAC-011) Publish BRS – Track 2 Market Simulation Track 1 Real-Time Reliability Applications	Dates May 20, 2022 Jun 23, 2022 Jun 16, 2022 Apr 20, 2023 Dec 13, 2023 Jan 30, 2024 Jun 11, 2024 By end of Sep 2024 NA Apr 1, 2024	Status ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓

2024 – FERC 881 – Managing Transmission Line Ratings

FERC 881 Project Timelines by Tracks



- Track 1 Real Time Reliability Applications
 - Delays in application deliver timeline with FAC-11 additions to the project.
 - Utilization of AAR in real time reliability applications.
 - Estimated Target Capability to be ready by Q3 2024. Originally Q2.
- Track 2 Operational/EMS Model Data and Applications
 - OATI WeblineR product will be utilized for receiving Look ahead ratings.
 - Finalizing OATI functional specification document.
 - Estimated Target Capability to be ready early 2025
- Track 3 Market Application and Look Ahead Applications
 - Requirements phase started and should be complete by September 2024.
 - Based on requirements gathering and vendor/internal resources constraints potential for delay in some aspects of implementation.
 - Estimated Target Capability to be ready in Q2 2025.



California ISO

Modification of Maximum Import Bid Price Hourly Energy Shaping Factor

Project Information	Details/Date
	Modify MIBP Energy Price Hourly Shaping Factor
High Level Project Scope	The new formula for shaping factor is based on the high-priced day SMEC only. Use high-priced day SMEC shape to adjust Electric Hub price of the trading day. This is a change from current one that using the SMEC of trade hour in trading day or the same hour of the closest prior day if trading day DAM is not run yet.

Milestone Type	Milestone Name	Dates	Status
BPM	Market Instruments	Yes	
Production	Activation	November 2024	



Enable Non-Generating Resources to Participate in Inter-SC Trade

Information	Details
Source	2024 Annual Policy Initiatives Roadmap Process
Category	Storage
Submission	Enable non-generating resources to participate in inter-SC trade
Summary	Allow non-generating resources to participate in inter-SC trade and offer physical energy product in order to continue effective integration of higher capacities of energy storage and meet RA and GHG compliance goals.
Description	In the current market design, standalone battery storage projects are not available to be selected in the "location" dropdown list for transactive physicals in IST. To continue effective integration of higher capacities of energy storage and meet RA and GHG compliance goals, the ISO should allow NGRs to participate in inter-SC trade and offer physical energy product. Enabling battery storage to participate in physical IST would increase market efficiency and reduce uncertainty in the preschedule window, and would allow battery storage to offer supplemental capacity or replacement energy through IST.
Presentation	May 15, 2024
System Impacts	Scheduling Infrastructure & Business Rules (SIBR)

Milestone Type	Milestone Name	Dates	Status
ВРМ	Publish PRR: Market Instruments		
SIBR Release Notes	Publish SIBR Release Notes		
SIBR Rules	Publish Inter-SC Trades Rules		
SIBR SC User Guide	Update to allow NGR for Physical Trades		
SIBR Inter-SC Trades (IST) Tutorial	Update to allow NGR for Physical Trades		
Market Simulation	Market Simulation		
Production	Activation		



Spring 2026 Release



Day Ahead Market Enhancements		
Project Information	Details/Date	
High Level Business Problem or Need	In recent years, Variable Energy Resource (VER) have gained significant traction in the energy grid, playing a crucial role in achieving renewable energy targets and reducing greenhouse gas emissions. However, their increasing presence has introduced a new challenge energy imbalances between the Day Ahead and Real Time markets.	
	Another reason for the energy imbalance is the day-ahead market operates on hourly time increments, whereas real-time market schedules energy in 15 and 5-minute intervals. This discrepancy in granularity results imbalances since the rea-I-time market schedules fluctuate within the hour while day-ahead market schedules remain fixed for the entire hour.	
	These imbalances necessitates out-of-market interventions by operators, such as forecast biasing and dispatches, to uphold grid reliability. However, this situation presents an opportunity to improve our market software, enabling us to achieve a more efficient and economical solution while addressing the variability and reliability concerns within the market.	
High Level Project Scope	 Enhance the California ISO's (CAISO's) day-ahead market by: Introducing an imbalance reserve (IRU/IRD) product to provide flexible capacity to account for real-time ramping needs Enhancing the residual unit commitment process to also ensure there is sufficient downward dispatch capability (RCU/RCD) Enhancing the day-ahead market to maximize benefits of greater West-wide diversity in the day-ahead optimization for Western Energy Imbalance Market participants 	
BPM Changes	Settlements and Billing, Market Instruments & Market Operations	
Tariff Changes	Sections 27, 31, 34, 39	
Impacted Systems	MF, SIBR, DAM, OASIS, CMRI, Settlements & Internal Systems	



Day Ahead Market Enhancements

System	High Level Changes
MF	Define IRU, IRD, RCU, RCD eligibility for the resource ID in MF.
SIBR	IRU,IRD,RCU,RCD bid rules
DAM	 Calculate IRU/IRD requirements MPM: Market Power Mitigation for IRU/IRD IFM: procure IRU/IRD IRU/IRD deployment scenarios IRU/IRD requirement distribution IRU/IRD in NA-AC power flow Include IRU/IRD in constraints RCU/RCD procurement RUC-MPM pass Impact on RUC performance with additional MPM pass LMP for EN, IRU/IRD, RCU/RCD
OASIS	IRU, IRC, RCU, RCD related public reports
CMRI	IRU, IRC, RCU, RCD related private reports
Settlements	IRU, IRC, RCU, RCD Settlements



Day Ahead Market Enhancements

Milestone Type	Milestone Name	Dates	Status
Board Approval	Board briefing/approval	May 17, 2023	\checkmark
External BRS	Publish External BRS v1.0	Jul 25, 2023	\checkmark
	Publish External BRS v1.1	Dec 22, 2023	\checkmark
	Publish External BRS v1.2	Apr 24, 2024	\checkmark
	Publish External BRS v1.3	Aug 02, 2024	\checkmark
Settlements Config Guides	Post Draft Config Guides - First set of charge codes	Jan 16, 2024	\checkmark
	Post Draft Config Guides - Second set of charge codes	Mar 26, 2024	\checkmark
	Post Draft Config Guides - Third set of charge codes & updates to First & Second sets	Aug 26, 2024	✓
Tech Spec	Publish Technical Specifications - OASIS	Nov 09, 2023	\checkmark
	Publish Technical Specifications – MF Publish MF GRDT v19.0 DRAFT	Nov 21, 2023	×
	Publish Technical Specifications - SIBR	Nov 28, 2023	\checkmark
	SIBR/BSAP/RCBSAP Rules Release Notes	Mar 05, 2024	\checkmark
	SIBR SC User Guide	Mar 05, 2024	\checkmark
	Publish Technical Specifications - CMRI	Dec 15, 2023	\checkmark
Tariff	First Draft Tariff Posting	Jun 02, 2023	\checkmark
	Second Draft Tariff Posting	Jul 11, 2023	\checkmark
	FERC Filing	Aug 22, 2023	\checkmark
	Receive FERC order – Acceptance in part	Dec 20, 2023	\checkmark
	Draft Compliance Filing Posting	Feb 05, 2024	\checkmark
	Compliance Filing	Feb 16, 2024	\checkmark
BPMs	Business Practice Summary (New)	Apr 25, 2024	\checkmark
	Post Draft BPM – Market Instruments	Apr 15, 2025	
	Post Draft BPM – Market Operations	Apr 15, 2025	
	Post Draft BPM – Settlements and Billing	Apr 15, 2025	
	Post Draft BPM – Definitions and Acronyms	Apr 15, 2025	
Implementation meeting	Configurable Parameters Implementation Working Group	Aug 07, 2024	\checkmark
External Training	External User Training	May 08, 2025	
Market Sim	Fall 2025 Release Market Simulation Plan	Jan 24, 2024	\checkmark
	Market Sim Scenarios	Aug 04, 2023	\checkmark
	Market Sim Window	Jun 02, 2025 - Aug 22, 2025	
Production Deployment	Day Ahead Market Enhancements (Inactive)	Oct 01, 2025	
Production Activation	Day Ahead Market Enhancements (Financially Binding)	May 01, 2026	



Extended Day Ahead Market (EDAM) Implementation

Project Information	Details/Date
High Level Business Problem or Need	The purpose of this initiative is to create a comprehensive extended day-ahead market that extends over multiple balancing authority areas (BAAs) participating in the Western Energy Imbalance Market (WEIM). EDAM is a voluntary day-ahead electricity market with the potential to deliver significant economic, environmental, and reliability benefits for participants across the West. EDAM will more efficiently and effectively integrate renewable resources and address the significant operational challenges presented by a rapidly changing resource mix, emerging technologies, and the impacts of climate change. EDAM will enable procurement of robust supply and flexible capacity that will position EDAM participants to effectively address changes in conditions from day-ahead to real-time, improving their response to potential reliability challenges. EDAM builds upon the proven ability of the WEIM to increase regional coordination, support state policy goals, and cost effectively meet demand.
High Level Project Scope	The EDAM design leverages existing features of the ISO day-ahead market that are common in other day-ahead markets across the country. The design also considers enhancements proposed in contemporaneous stakeholder initiatives that will harness flexibility across the larger footprint by incorporating an imbalance reserve product that will enhance price formation. EDAM introduces new products, imbalance reserve and reliability capacity, as well as new penalties, and a Resource Sufficiency Evaluation (RSE) surcharge.
BPM Changes	Definitions and Acronyms Energy Imbalance Market (EIM) Market Instruments Market Operations Settlements and Billing EDAM
Impacted Systems	MF, ALFS, ALFS-SOA, SIBR, RTSI, RTBS, BSAP, DAM (IFM and RUC), DA-RSE (new), RTM (RTPD and RTD), STUC, MPM, ITS, BARC, GHG Pass (new), Settlements, CMRI, OASIS, ADS, WebOMS, Internal ISO Systems



Extended Day Ahead Market (EDAM) Implementation

Milestone Type	Milestone Name	Dates	Status
Board Approval	Board approval	Feb 01, 2023	\checkmark
	Publish External BRS v1.0	Aug 02, 2023	\checkmark
External BRS	Publish External BRS v1.1	Dec 22, 2023	\checkmark
	Publish External BRS v1.2	Apr 25, 2024	\checkmark
	Publish External BRS v1 3	Αμα 05, 2024	1
	Draft Tariff Language	Mar 30, 2023	· ·
	Pavies d Draft Language	lun 08, 2023	1
		Jul 25, 2023	
		Jui 25, 2025	*
		Aug 22, 2023	× /
	Receive FERC order – Acceptance in part	Dec 20, 2023	v
		B	
Tariff	Requested effective date for tariff changes for EDAM agreements and onboarding provisions	Dec 21, 2023	\checkmark
	Draft Compliance Filing Posting	Feb 05, 2024	\checkmark
	Compliance Filing; accepted Apr 30, 2024	Feb 16, 2024	\checkmark
	Filing for EDAM access charge	Apr 12, 2024	\checkmark
	Receive FERC order accepting EDAM Access Charge Design (EDAM Tariff fully approved)	Jun 11, 2024	\checkmark
	Post Draft Config Guides - First set of charge codes	Jan 16, 2024	\checkmark
Settlements	Post Draft Config Guides-Second set of charge codes	Mar 26, 2024	\checkmark
Config Guides	Post Draft Config Guides - Third set of charge codes & updates to First & Second sets	Aug 26, 2024	1
	Publish Technical Specifications – RTSI	Dec 5, 2023	1
	Publish Technical Specifications – MF	lan 4 2024	
	Publich Tachnical Specifications – SIPP	Mar 21 2024	
		Apr 12, 2024	×,
Tech Spec	Publish Technical Specifications - OASIS	Apr 12, 2024	× .
-	Publish Fechnical Specifications – CMRI	Apr 12, 2024	×.
	Publish Technical Specifications – PLC	Jul 19, 2024	✓
	Publish Technical Specifications – ALFS	NA	
	Publish Technical Specifications – OMS	NA	
	Business Practice Summary	Jul 10, 2024	\checkmark
	Post Draft BPM – Energy Imbalance Market (EIM)		
	Post Draft BPM – Market Instruments		
BPMs	Post Draft BPM – Market Operations	TBD	
	Post Draft BPM – Settlements and Billing		
	Post Draft BPM – EDAM		
	Post Draft BPM – Definitions and Acronyms		
	Fall 2025 Release Market Simulation Plan	Jan 24, 2024	\checkmark
	Market Sim Scenarios	Jan 29, 2024	\checkmark
MarketSim	Market Sim Scenarios v1 1	Feb 15, 2024	\checkmark
	EDAM Onboarding Market Sim	Sep 01 $2025 - 12016 2026$	
Parallel Operations	Draft Grapial Onerations Plan	Apr 15 2024	1
r araller Operations	EDAM Production Doolowmant Inactive	$\Omega_{ct} 01, 2024$	· ·
Dreduction	EDAW Floudution Deproyment - Induive	May 01, 2020	
Production	EDAMI Unboarding (Financially Binding) & Activation (Pacificorp & BANC)	May 01, 2026	
		Fail 2026	
🥣 Calit	ornia ISO Caiso Public		

EDAM & DAME Activation May 1, 2026

1/24/2023 EDAM Onboarding Timeline (w/implementation and WEIM) - proposed



Key EDAM Onboarding Milestones to Date





Spring 2026 – EDAM ISO BAA Participation Rules Track A

Project Information	Details/Date
Policy Scope	The purpose of this initiative was to define the unique aspects of how the ISO Balancing Authority Area (BAA) will participate in the Extended Day-Ahead Market (EDAM). The policy addressed how to settle Transfer Resources and Transfer Revenue, the criteria to set ISO BAA's net EDAM Export Transfer constraint, how to allocate ISO BAA resource sufficiency evaluation (RSE) failure surcharges and revenues, and the process for calculating historical revenue recovery amounts.
Tariff Changes	 FERC Filing ER24-379 - Sections 11, 26, and 27 Approved Tariff Changes: To allow for the settlement of all Transfer System Resources in the CAISO BA. To allow for the settlement of EDAM Transfer revenue allocated to the CAISO BA, inclusive of EDAM Transfer revenue and EIM Transfer revenue To allow the CAISO BA to enable the Net EDAM Export Transfer Constraint, a voluntary, and optional, mechanism that each EDAM Balancing Authority may enable to preserve sufficient supply to meet its projected needs, while managing reliability based on conditions and circumstances anticipated within its balancing area. To allow an interim solution for the CAISO to distribute all CAISO BA revenues and surcharges for the EDAM RSE Failure Surcharge. Unapproved Tariff Changes (requires refiling): To set forth the calculations for the EDAM Historical Revenue Recovery amounts for transmission owners in the CAISO BA
High Level Project Scope	Based on current approved Tariff changes
Impacted Systems	Internal ISO Systems, Settlement configuration changes



Spring 2026 – EDAM ISO BAA Participation Rules Track A

Milestone Type	Milestone Name	Dates	Statue
Policy	Track A1 Final Proposal	Aug 31, 2023	V
Development	EDAM Recoverable Revenue for CAISO BAA policy confirmation	Part of tariff work	
Board Approval	Board approval	Sep 21, 2023	\checkmark
	Draft Tariff Language	Aug 25, 2023	\checkmark
	Reviœd Tariff Language	Oct 11, 2023	\checkmark
	FERC Filing (CAISO BA Participation in EDAM ER24-379)	Nov 13, 2023	\checkmark
	FERC Order (DAME/EDAM in ER23-2686): didn't accept EDAM Access Charge	Dec 20, 2023	\checkmark
	FERC Order (CAISO BA Participation in EDAM ER24-379): acceptance in part, mooted EDAM Recoverable Revenue for CAISO BAA	Mar 7. 2024	\checkmark
Tariff			
Idilli	FERC Filing (EDAM Access Charge ER24-1746)	Apr 12, 2024	√
	FERC Order (EDAM Access Charge ER24-1746): acceptance	Jun 11, 2024	\checkmark
	EDAM Bessy archie Bevenue for CAISO BAA		
	EDAM Recoverable revenue for CAISO BAA	TRD	
	Publish External BRS	Jun 18, 2024	\checkmark
		o (= ooo)	
	Publish External BRS v1.2: Clarifications, corrections, adding market sim requirements	Sep 17, 2024	~
	Confirmed Market Operations BPM takes precedence for CISO BAA Stressed Hour evaluation criteria		
External BRS	 Removed Glossary for forthcoming consolidation of terms with EDAM, DAME initiatives (in interim, please formed to its for the second second second second second second second sec		
	reference tariff filings)		
	 Clarine a trat EDAM transfers will not be binding (only advisory). WEIM base schedule transfers remain binding. Market Sim Derwise meets and Secondarias 		
	• Market Sim Requirements and Scenarios		
	Publish External BRS v1.n : EDAM Recoverable Revenue for CAISO BAA tariff dependency	TBD	
	Post Draft Config Guides-second set of charge codes	Mar 26, 2026	\checkmark
O a tilla man ti O a m fi m	Post Revised Draft Config Guides - second set of charge codes	Aug 26, 2024	\checkmark
Settlement Config	Post Draft Config Guides - third set of charge codes	Aug 23, 2024	✓
Guides	Post Draft Config Guides - charge codes impacted by EDAM Recoverable Revenue for CAISO BAA - changes subject to tariff	Aug 23, 2024	✓
	stakeholder process		
Tech Spec	Part of EDAM framework (if applicable)		
	Post Draft BPMs		
	CRR		
	Definitions and Acronyms		
	Energy Imbalance Market (EIM)		
BPMs	EDAM	IBD	
	Market Instruments		
	Market Operations		
	Settlements and Billing		
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warket SIM	EDAM Broduction Deployment Insertive		,
Production	EDAM Production Deproyment - Inactive	Oct 01, 2025	
	EDAW Onboarding (Financially Binding) & Activation	May 01, 2026	

Spring 2026 – WEIM BHE Montana

Project Info	Details/Date
Application Software Changes	System modifications as needed to accommodate any unique Berkshire Hathaway Energy Montana needs to support their WEIM onboarding.
BPM Changes	WEIM BPM will be updated if needed to reflect changes identified during the onboarding and as required to reflect the unique processes of Berkshire Hathaway Energy Montana.
Market Simulation	December 2025 thru January 2026
Parallel Operations	February 2026 thru March 2026

Milestone Type	Milestone Name	Dates
Market Sim	Market Sim Window	Dec 2025 thru Jan 2026
Parallel Operations	Parallel Operations	Feb 2026 thru Mar 2026
Tariff	File Implementation Agreement FERC acceptance of Implementation Agreement File Readiness Certification	 ✓ Mar 27, 2024 ✓ May 17, 2024 Mar 2026
Production	Activation	May 2026



Future Releases



Subscriber Participating Transmission Ownership Model Project Details/Date Information The Subscriber Participating Transmission Owner (Subscriber PTO) model is a new transmission development option available for transmission projects with generation development opportunities outside the CAISO balancing area to bring generation to meet California's policy initiatives. The model specifically supports CPUC generation portfolios required by the memorandum of understanding with the California State agencies and the CAISO. Accordingly, the Subscriber PTO model allows for additional transmission to be developed to connect the CAISO BAA with out-of-state generation that currently lack the necessary transmission to provide electricity to the CAISO BAA. The Subscriber PTO model thereby provides an option for projects not **High Level** chosen in the transmission planning process to solicit Subscribers who then pay for the project (generation and transmission) Business and join the CAISO balancing area. **Problem or** Need The new Subscriber PTO Model enables a subscriber PTO to develop its project without recovering the costs for its project through a transmission revenue requirement. At the same time, those who have paid for the project, *i.e.*, the subscribers, are exempt from congestion and other related costs on the subscriber PTO line because the subscribers will receive similar treatment and priority to existing contract rights holders (ETCs). Additionally, the Subscriber PTO model provides a mechanism for subscribers that financed the project and associated network upgrades the ability to receive reimbursement for those costs from non-subscribers that use the Subscriber PTO transmission facilities. Develop Subscriber PTO Model: account for a new PTO model that does not increase the Transmission Revenue Requirement (TRR) of the Transmission Access Charge / Wheeling Access Charge (TAC/WAC)) and provides those who funded the project ("subscribers") with Existing Transmission Contract (ETC) designation to account for their rights on the CAISO controlled arid Revise the TAC allocation process to fund the non-Subscriber usage payment amount ahead of allocation to the non-load serving PTOs Charge non-subscribers for use of the Subscriber PTO line the applicable non-subscriber usage rate (\$/MWH) **High Level** Create a mechanism that allows for the payment to the Subscriber PTO for non-subscriber usage of the Subscriber PTO Project transmission facility: Scope Compare the Non-Subscriber Usage rate(s) (\$/MWh rate approved by FERC) to the TAC rate and pay the Subscriber PTO the lower of the two values o Create a flag to denote when the Non-Subscriber Usage Rate is higher than the TAC rate and publish results in the ISO bill determinant file Indicate monthly gross exports and imports for Non-Subscriber usage of the Subscriber PTO transmission line o Indicate the TAC rate and the Non-Subscriber Usage Rate(s) as part of the Settlements TAC reports Develop methodology to address economic BAA to BAA transfers at new scheduling points created by Subscriber PTO transmission lines

Subscriber Participating Transmission Ownership Model

System	High Level Changes
BPM Changes	 Definitions and Acronyms Generator Interconnection and Deliverability Allocation Procedures Market Instruments Market Operations Reliability Requirements Settlements & Billing Transmission Planning Process
Tariff Changes	 Section 4: Roles and Responsibilities Section 16: Existing Contracts Section 24: Comprehensive Transmission Planning Process Section 25: Interconnection of Generating Units and Facilities Section 26: Transmission Rates and Charges Appendix A: Master Definition Supplement Appendix F: Rate Schedules Appendix DD: Generator Interconnection Deliverability Allocation Procedures
Impacted System	ns
MF	Develop Subscriber PTO model: including new participant type, new TAC area, new UDC, new WAC rules, and mapping
CIRA	 Identify resources subject to MIC and stablish MIC at Sub PTO scheduling points/interties Define RA obligation
SIBR	Receive ETC designation and support bidding rules for subscriber generating resources (existing functionality)
ITS	 Consume new tie points and/or ITCs Add Subscriber PTO loss resource IDs to loss table
IFM/RTM	 Calculate ASRS Consume all hourly MSSC values
Settlements/ DReAMS	 Develop new bill determinants Calculate financial loss return Apply existing ETC rules Update TAC/WAC revenue allocation process to include non-subscriber usage rate Update configuration guides and bill determinants Exclude Subscriber PTO UDC areas from UFE

Subscriber Participating Transmission Ownership Model

Milestone Type	Milestone Name	Dates	Status
Policy	Straw Proposal	Feb 13, 2023	\checkmark
	Draft Final Proposal	Apr 10, 2023	\checkmark
	Revised Draft Final Proposal	May 15, 2023	\checkmark
	Final Proposal	Jun 22, 2023	\checkmark
Tariff	First Draft Tariff Posting	Jun 22, 2023	\checkmark
	Second Draft Tariff Posting	August 08, 2023	\checkmark
Board Approval	Board approval	July 20, 2023	\checkmark
BRS	Publish BRS v1.0	Jul 26, 2024	\checkmark
Settlements Config Guides	Post Draft Configuration Guide	Yes	
Tech Spec	Publish Technical Specifications	Yes	
BPMs	Post Draft BPM – Definitions and AcronymsPost Draft BPM – Generator Interconnection and DeliverabilityAllocation ProceduresPost Draft BPM – Market InstrumentsPost Draft BPM – Market OperationsPost Draft BPM – Reliability RequirementsPost Draft BPM – Settlements and BillingPost Draft BPM – Transmission Planning Process	Yes	
Training	Training	Yes	
Market Sim	Market Sim Scenarios	Yes	
	Market Sim Window	Yes	
Deployment	Production Deployment	TBD	
Activation	Production Activation	TBD	





Settlement Upgrade Project

Jul 23, 2024

Settlement Upgrade Project – Overview

- The current settlement system, implemented in 2008 as part of the Market Redesign and Technology Upgrade (MRTU) implementation, is nearing its end of life. The CAISO is upgrading existing settlement applications to approved architectural and information security standards.
- Benefits for our customers include:
- Improved business efficiency
- Better gathering and analysis for data and front-end improvements for customers interacting with CAISO Settlement Systems
- Increased transparency for some calculations
- Accommodating data processing increases resulting from new market products and an increase in market participants
- Ability to perform complex settlement calculations



Settlement Upgrade Project – Targeted Goals

- The ISO will work closely with our market participants to ensure seamless transition from e-terra 2.5 to 3.0 configuration output file.
- The ISO will leverage the Settlement User Group and Technical User Group for participants to ask more technical questions.
- The ISO will provide an environment with production-like data allowing customers to validate changes.
- The system will provide settlement outputs in various file formats, allowing all customers to access and use the data in day-to-day operations.
- The ISO will strive to make formulas and inputs transparent to enable market participants to monitor and/or validate settlement results.
- The ISO will provide market participants with an extended market simulation and timely support to the market participants and their vendors during the testing phase.



Settlement Upgrade Project – Targeted Goals (continued)

- From a vendor perspective:
- ISO will provide third party vendors with support during the transition period.
- ISO will provide an extended market simulation and/or parallel statements and invoices during the transition period so vendors can resolve defects on their systems.
- ISO will provide open communications to resolve settlement differences through a customer forum.



Settlement Upgrade Project – Status

- The ISO is reviewing the overall schedule for implementation. The current schedule is colliding with EDAM and DAME implementation.
- In order to allow customers to have the time to focus on the Settlement Upgrade Project, as well as EDAM and DAME, a new schedule will be developed.
- ISO will provide quarterly updates for the implementation for now and will ultimately increase the frequency of updates and the depth of information provided accordingly as we proceed
- The updates will be provided in the Release User Group and Settlement User Group
- To help ensure alignment of our communications between these two (2) forums, this same update was provided in the next Settlement User Group call
- The next Settlement Upgrade Project update will be in October 2024
- For comments or questions, please submit CIDI cases



Stay Informed



Ways to participate in releases

- Visit the Release Planning page
 - <u>http://www.caiso.com/informed/Pages/ReleasePlanning/Default.aspx</u>
- Attend meetings
 - Release Users Group (RUG) bi-weekly meetings
 - Initiative status updates
 - System change updates on releases
 - Market Simulation calls
 - Visit the ISO calendar at <u>www.caiso.com</u> for meeting dates and times and add events to your calendar
 - Typically held on Mondays and Thursdays
 - Market Performance and Planning Forum
 - Quarterly review of market performance topics
 - High level discussion of release planning, implementation and new market enhancements



RUG Calendar 2024

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CAISO Holiday

RUG Forum



Contact

- tvo@caiso.com
- <u>release@caiso.com</u>
- CIDI
 - Functional Environment (Area)
 - "Release"
 - "Market Simulation"


Upcoming MPPF meeting

The next MPPF is scheduled on Sep 18, 2024. <u>https://www.caiso.com/meetings-events/topics/market-performance-and-planning-forum</u>

2024

Market Performance and Planning Forum Meetings

Note: dates subject to change; for the latest information please visit the Calendar on www.caiso.com

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Meeting



For reference

Visit user group webpage for more information: <u>https://www.caiso.com/meetings-events/topics/market-performance-and-planning-forum</u>

If you have any questions, please contact Brenda Corona at <u>bcorona@caiso.com</u> or <u>isostakeholderaffairs@caiso.com</u>



The ISO Learning Center is now the Training Center!



Find the same great info under the Stakeholder Center tab on the redesigned ISO website



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Reminder: New 'Training' page on Market Participant Portal (MPP)

California ISO Market Participant Portal Contact Us Help his site MPP Home Transmission Planning CRR FNM Market Modeling Data System Integration Discussions EIM Daily Market Performance Reports RC Working Groups Training Artications AIM Access and Identity Management Welcome to the California ISO Market Participant Portal, ADS Automated Dispatch System the centralized access point for secure applications and business critical information.. HC Help Center CIDI Customer Inquiry Dispute and Information

Allows Scheduling Coordinators (SCs) to further their base curriculum knowledge

For any questions or comments please email CustomerReadiness@caiso.com



CAISO PUBLIC MPP SharePoint page link <u>https://mpp.caiso.com/Pages/Default.aspx</u>

Training Page on Market Participant Portal (MPP)

Scalifornia ISO Market Participant Portal

MPP Home Transmission Planning System Integration Discussions EIM Daily Market Performance Reports RC Working Groups Training



Training page requires ISO certificate access Videos are organized by topics

Resources Scheduling Coordinator Certification Process High Level Overview of Training Page

Scheduling Coordinator Computer-Based Training

Working with the ISO



Markets and Operations



High Level Overview of Training Page link - <u>https://www.youtube.com/watch?v=AOmHkoLfTBY</u>



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UPDATE: The archived version of caiso.com will be available until July 15, 2024



Energy Matters blog provides timely insights into ISO grid and market operations as well as other industryrelated news

Energy Matters blog | California ISO (caiso.com)

Read a recent article featured in the blog:



Story | Transmission GridTECH Connect Forum brings together interconnection experts

By: Jill Powers

06/10/2024



Story | Reports

New renewables records – what they mean for the grid and its carbon-free future

By: Amber Motley

06/06/2024





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REGISTRATION IS OPEN 2024 STAKEHOLDER SYMPOSIUM

Welcome reception - Oct. 29

at Kimpton Sawyer Hotel, Sacramento, CA

Symposium program - Oct. 30

SAFE Credit Union Convention Center Sacramento, CA

Visit the event website: www.reg.eventmobi.com/2024stakeholdersymposium

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