

Release User Group Agenda

February 21, 2023

10:00 a.m.-11:00 a.m. (Pacific Time)

Web Conference Information	Conference Call Information	
Web Address: <u>https://caiso.webex.com/caiso/j.php?MTID=m8f4dee2c7</u> 059898b3609c46be3cd2c20 Audio connection instructions will be available after connecting to the web conference. When prompted, select "Call me" and enter the phone number you will use during the call. You will be called by the conference shortly.	1-844-621-3956 United States Toll Free +1-650-479-3208 United States Toll Meeting number (access code): 2491 042 7352	
Calls and webinars are recorded for stakeholder convenience, allowing those who are unable to attend to listen to the recordings after the meetings. The recordings will be publicly available on the ISO web page for a limited time following the meetings. The recordings, and any related transcriptions, should not be reprinted without the ISO's permission.		
https://www.caiso.com/informed/Pages/MeetingsEvents/UserGroupsRecurringMeetings/Default.aspx#RUG		
http://www.caiso.com/informed/Pages/ReleasePlanning/Default.aspx		

ISO Training Schedule

Training Course	Date and time
ISO Workshop: Introduction to ISO Markets (session is full - waitlist only)	March 7 and 8 9am – 12pm PPT
ISO Workshop: Market Transactions (session is full - waitlist only)	March 14 and 15 9am – 12pm PPT
ISO Workshop: ISO Settlements (session is full - waitlist only)	March 21 and 22 9am – 12pm PPT
ISO Workshop: Introduction to ISO Markets	August 8 and 9 9am – 12pm PPT
ISO Workshop: Market Transactions	August 15 and 16 9am – 12pm PPT
ISO Workshop: ISO Settlements	August 22 and 23 9am – 12pm PPT

Are you looking for more training?

The ISO Learning Center has computer based training available for lots of topics. Check out the Learning Center: <u>http://www.caiso.com/participate/Pages/LearningCenter/default.aspx</u>



ISO PUBLIC

CustomerReadiness@caiso.com

Release Plan Summary

2023 Independent

Operations Systems Improvements Enhancements WEIM Enhancements: Shared Ramping Constraint; March 2023 WEIM Enhancements: ETSR UI; April 2023 Washington WEIM Greenhouse Gas Enhancements

2023 Summer – Tentative, under further assessment

Ancillary Service State of Charge Constraint Energy Storage Enhancements Phase 1 Track 1 – Ancillary Services & Exceptional Dispatch WEIM Resource Sufficiency Evaluation Enhancements Phase 2 Track 1 Hybrid Resources Phase 2C

Future Release – Tentative, under further assessment

Transmission Service & Market Scheduling Priorities Phase 2 Day-Ahead Market Enhancements Extended Day-Ahead Market Congestion Revenue Rights System Replacement



Release Plan Summary WEIM Spring 2023

WEIM Spring 2023 Release

WEIM 2023 – Avangrid

- WEIM 2023 El Paso Electric
- WEIM 2023 WAPA Desert Southwest Region



Independent 2023 Releases



WEIM Enhancements

Project Information	Details/Date
High Level Business Problem or Need	To collectively address important issues identified by WEIM market participants through Customer Inquiry, Dispute and Information system (CIDI) requests to improve the visibility, functions and features in Energy Imbalance Market (WEIM).
High Level Project Scope	 BAAOP: ETSR detail screen will be available to BOTH RTMO and WEIMs. (First drop for testing will only be available to RTMO). BAAOP: WEIM shared ramping constraint IS NOT editable through UI.
BPM Changes	WEIM, Market Instruments
Tariff Change	Section 29.4
Impacted Systems	RTM/BAAOP, RTM/Integration

System	High Level Changes
Real-Time Market	BAAOP: WEIM shared ramping constraint IS NOT editable through UI. March 2023
(RTM)	 Shared ramping capability constraint UI for WEIM entity input parameters for ramp sharing Use in the optimization for each resource based on BAA ramp share parameters
Real-Time Market (RTM)	 BAAOP: ETSR detail screen <i>April 2023</i> ETSR detail screen will be available to BOTH RTMO and WEIMs. (First drop for testing will only be available to RTMO). New ETSR detail screens Currently in "Coming Soon"



Operations Systems Improvements 2021/2022 Enhancements

Project Information	Description		
High Level Business Problem or Need	• The goal of this project is to deliver timely systems improvements that support efficient day-to-day work and operations. The project aims to 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 functionality enhancements. A list of specific high priority improvements will be the scope for the project. A number of these improvements may have an impact on the way in which customers interact with CAISO systems.		
Affected Systems	 A preliminary list of enhancements is included on the next slide. PLEASE NOTE: This list may change as the project progresses and priority are factored. The goal is to provide advanced notification of changes whenever possible 		
Schedule	 External BRS 2022 External BRS v1.0 Published 5/3 UPDATE v1.1 Published 8/12 MAP Stage Availability Customer Training PROD Multiple* Multiple* * The plans for testing and deployment will vary between improvement items as these may be released individually or in groups. More information on specific improvements will be made available as planning and schedules are solidified. 		

Operations Systems Improvements Projects

List of Proposed Improvements*

*PLEASE NOTE: This list may change as the project progresses and priorities are factored. The goal is to provide advanced notification of changes whenever possible

2023

System	Summary Description	
Market	Modify Unit Details UI	Outreach/Release Note - 2023
		PROD - 2023



2023 Summer, and Future Releases

Tentative, under further assessment



Overview - Tentative

Release	Project	BOG	Tariff	BRS	Settlements CG	Settlements Effective Date	Production Activation
2023	Washington WEIM Greenhouse Gas Enhancements	Oct 2022 - Approved	Filed 11/21/22 Accepted 02/10/23	02/06/23	N/A	N/A	2023
	Ancillary Service State of Charge		Filed 09/19/22	02/09/23	Tech Doc 2/13	Retroactive	2023
	Constraint		Accepted 11/18/22	02/03/23	1 st Draft CG TBD	to 09/20/22	2025
	Energy Storage Enhancements Phase 1 Track 1 – Ancillary	Dec 2022 - Approved	Draft 02/10/23	02/08/23	Tech Doc 2/17	1 st of the month; new	2023
	Services & Exceptional Dispatch	Dec 2022 - Approved	Diait 02/10/23	02/06/25	1 st Draft CG TBD	CCs	2023
	WEIM Resource Sufficiency Evaluation Enhancements Phase 2	Dec 2022 - Approved	Revised 12/12/22	02/10/23	Tech Doc 2/17	1 st of the month; new	2023
	Track 1	Dec 2022 - Approved	Nevi3eu 12/12/22	02/10/23	1 st Draft CG TBD	CCs	2023
	Hybrid Resources Phase 2C			01/31/23	Tech Doc 2/13	1 st of the	2023
	Tybrid Resources Thase 20			01/31/23	1 st Draft CG TBD	month	
	Transmission Service & Market Scheduling Priorities Phase 2	Feb 2023 - Approved					Summer 2024
Future Release	Day-Ahead Market Enhancements	Feb 2023 – Briefing Decision Upcoming					Fall 2024
	Extended Day-Ahead Market	Feb 2023 – Approved					Fall 2024
	On-Boarding						Spring 2025



Overview – System Impacts

Project	ADS	CMRI	Master File	MF RDT	OASIS	RIMS	Settlements	Market	SIBR
WA WEIM GHG Enhancements		Х	X	X	X		X	X	x
Ancillary Service State of Charge Constraint		X					X	X	
Energy Storage Enhancements Phase 1	X	X			X	X	X	X	X
Track 1 AS & ED WEIM Resource Sufficiency Evaluation			V		V		V	×	
Enhancements Phase 2 Track 1			X		X		X	X	
Hybrid Resources2C						X	X		



Overview – System Interface Changes

System	Project	UI	ΑΡΙ	Data
ADS	ESE1T1	Existing	Existing	New Reason Codes
CMRI	WA WEIM GHGE	Existing	Existing	New Attributes/Records
CMRI	ASSOCC	New to display ASSOCC binding constraints	New to display ASSOCC binding constraints	
CMRI	ESE1T1	New to display Exceptional Dispatch Hold State of Charge	New to display Exceptional Dispatch Hold State of Charge	
OASIS	WA WEIM GHGE	Existing: Prices > Index Prices > Greenhouse Gas Allowance Index Prices	Existing – Prices > Index Prices > Greenhouse Gas Allowance Index Prices	Add WA GHG index prices
OASIS	ESE1T1	Existing: Initiated Commitment report	Existing Initiated Commitment report	New code: Operator
OASIS	RSEE2T1	Existing: Energy > EIM > WEIM RSE Capacity Tests Existing: Energy > Flexible Ramping > Flexible Ramp Requirements Inputs and Outputs (WEIM RSE Flexible Ramping Tests)	Existing: Energy > EIM > WEIM RSE Capacity Tests Existing: Energy > Flexible Ramping > Flexible Ramp Requirements Inputs and Outputs (WEIM RSE Flexible Ramping Tests)	 > Original data publishing is existing system functionality. > Corrected data publishing is new system functionality that will be published on same existing report as original data.
OASIS	RSEE2T1	New: Public Bids > Market Bid Caps	New: Public Bids > Market Bid Caps	



Independent 2023 – WA WEIM GHG Enhancements - Overview

Project Information	Details/Date
High Level Business Problem or Need	Pursuant to State of Washington's recently revised Clean Air Act and beginning in 2023, Washington (WA) will require reporting of emissions associated with Western Energy Imbalance Market (WEIM) transactions. Emissions reporting is a key element of Washington's new cap-and-invest program that sets a limit on overall carbon emissions in Washington and requires emitters to obtain allowances equal to their covered GHG emissions. This initiative comprises the first phase of enhancements to support reporting WEIM transactions for emissions year 2022. As reporting rules continue to develop, additional enhancements outside of the scope of this initiative will likely be necessary.
High Level Project Scope	 Identify resources within WA State boundary Update WA State associated resources' greenhouse gas (GHG) reference levels with dynamic pricing using vendor-provided indices Note: while Tariff stipulates use of static pricing as an interim measure prior to the first Washington allowance auction, due to implementation timing, this is not anticipated to be necessary. This first auction is scheduled for February 28, 2023. Calculate and publish monthly projected GHG prices for Washington State Develop reports to support WEIM Entity annual reporting to Washington State
BPM Changes	Energy Imbalance Market (EIM), Market Instruments
Tariff Changes	Sections 30.4.4.5, 30.4.5.2, 39.6.1.6.2, 39.7.1.1.1.1, 39.7.1.1.1.2, 39.7.1.1.1.4
Impacted Systems	MF, Internal System, SIBR, OASIS



Independent 2023 – WA WEIM GHG Enhancements - Overview

System	High Level Changes
MF	 New rule to verify that relevant resources within WA State must provide resource specified GHG emission rate New attribute at the BAA level to identify BAAs associated with Washington State New attribute to associate resources within WA State with the State of WA to identify resources with GHG obligation Exception: BPA—not subject to WA reporting rule
Internal System	 Reference level (commitment costs/DEBs) changes to reflect GHG costs DEBs to include GHG components for generators inside WA State Update GHG startup cost curve for resources inside WA State Update Greenhouse Gas Minimum Load Cost Allowance Differentiate between CA and WA resources Capture WA GHG price in the resource-specific minimum load and startup GHG adders for the purposes of commitment cost calculations
SIBR	 Receive startup GHG adders for the purposes of commitment cost calculations for WA State resources Confirm GHG curves generated for WEIM resources within WA State are successfully received and processed
OASIS	 Add WA GHG index prices to existing GHG Index Price OASIS report Only applicable for dynamic GHG pricing



Summer 2023 – Ancillary Services State of Charge Constraint

Project Information	Details/Date
High Level Business Problem or Need	In spring of 2022, the Department of Market Monitoring (DMM) discovered undue market outcomes resulting from regulation down awards to or self-provisions by storage resources for long periods when paired with high energy bids from those resources. Both DMM and the CAISO have concluded that these excess bid cost recovery payments under these conditions cannot be justified by the principles underlying bid cost recovery.
High Level Project Scope	 Make storage resources ineligible for Bid Cost Recovery (BCR) uplift for certain market intervals in real time: When the market state of charge (SOC) constraint is binding due to AS Awards causing the market to dispatch resource energy uneconomically. Retroactively settle relevant intervals (beginning with effective date of 09/20/2022)
BPM Changes	Market Instruments, Market Operations, Settlements and Billing
Tariff Changes	Sections 8.4.3, 8.4.1.1(g), 11.6.6 Note: Tariff filing completed on 09/19/2022
Impacted Systems	RTM, Settlements, CMRI
System	High Level Changes
Real Time Markets (RTM)	Capture RTD/RTPD AS SOC binding constraint shadow price data
Settlements	Design new bill determinants and configurations using the RTD/RTPD AS SOC binding constraint shadow price data for calculation of BCR ineligibility
CAISO Market Results Interface (CMRI)	Develop new external report to inform on AS SOC binding constraint for settlement purposes (resource specific- private report)



Summer 2023 – Energy Storage Enhancements Phase 1 Track 1 AS & ED

Project Information	Details				
High Level Business Problem or Need	This initiative includes enhancements to reliability processes and tools to better manage energy storage resource state of charge. The initiative also includes day-ahead storage resource DEB updates to better capture storage resource opportunity costs.				
	Scope 1: Reliability Enhancements				
	Include expected impacts from regulation in State of Charge (SOC)				
	Require storage to bid energy in the opposite direction of Ancillary Service (AS) awards				
	A resource providing regulation up/regulation down must have energy bids to charge/discharge (respectively)				
	Energy bids must be 50% of AS awards				
	Allow for Exceptional Dispatches (EDs) to be issued for storage resources to hold SOC				
	Storage may receive a traditional ED or an SOC ED, but not both				
High Level Project Scope	 Include lost opportunity from not generating due to hold SOC ED in storage compensation 				
	 Calculate counterfactual energy revenues with and without the hold SOC ED 				
	 If prices are below bids counterfactuals will not include discharges 				
	Use actual LMPs (the ISO will not generate counterfactual LMPs)				
	 Include hold SOC ED period through the end of the day in time horizon 				
	Different Settlement process than traditional ED				
	Scope 2: Reference Level Enhancements				
	Update DA storage resource default energy bid (DEB) to include storage specific opportunity cost				
BPM Changes	Market Instruments, Market Operations, Settlements and Billing				
Impacted Systems	RIMS, SIBR, Market, ADS, Settlements, CMRI, OASIS				



Summer 2023 – WEIM Resource Sufficiency Evaluation Enhancements Phase 2 Track 1

Project Information	Details		
High Level Project Scope	 Exclude RTLPT exports and RT economic (RTECON) exports that that are associated with latest RTPD run from the following RSE tests for CAISO BAA Capacity Test (Upward and Downward) Flexible Ramping Sufficiency Upward Test Facilitate assistance energy transfer between WEIM BAAs into the WEIM BAAs that failed RSE upward test: Added as ex-post surcharge through Settlements. Market broadcasts needed data to Settlements. Clarification of Post-HASP Block Hour Low-Priority Export Require DALPT and DA economic (DAECON) export that clears both RUC and HASP, RTLPT and RT economic (RTECON) export that clears HASP be e-tagged as "Firm Provisional Energy (G-FP)" 		
BPM Changes	Western Energy Imbalance Market, Market Operations, Settlements and Billing		
Tariff Changes	Sections 29.11, 29.34		
Impacted Systems	MF, Market, Settlements, OASIS		



Summer 2023 – Hybrid Resources 2C

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	Direct Telemetry, Market Instruments, Metering, Settlements & Billing		
Impacted Systems	stems RIMS, Settlements, Today's Outlook, ISO Today Mobile Application, Reports		
Requirements	irements http://www.caiso.com/Documents/BusinessRequirementsSpecifications-HybridResourcesPhase2.pdf		



CRR System Upgrade



Congestion Revenue Rights (CRR) Upgrade

Project Information	Details/Date		
High Level Project Scope	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.		
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.		



Congestion Revenue Rights (CRR) Upgrade

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 download 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 Awards payload on event-driven, ad-hoc or scheduled basis Publish CRR Awards 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, 		
CTS	Broadcast		
EMMS	CRR will consume data from EMMS		
IFM/RTN	CRR will consume data from IFM/RTN		
MQS	 MQS will consume and process SCID in a new format MQS will consume ownership 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		



Congestion Revenue Rights (CRR) Upgrade

Milestone Type	Milestone Name	Dates	Status
Board Approval	Obtain Board of Governors Approval	N/A	
External BRS	Publish External BRS	Nov 16, 2022	✓
Config Guides Post Draft Config Guides		Yes	
Tech Spec	Publish Technical Specification	Yes	
Customer Partnership Group	Next CPG	Feb 22, 2023	



CRR System Upgrade – Get Connected

- CRR External 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
 - Next CPG meeting is Wed, 2/22 @ 10 AM



WEIM Spring 2023 Release



WEIM Spring 2023 – WEIM integrations for Avangrid, El Paso Electric, and WAPA Desert Southwest Region

Project Info	Details/Date
Application Software Changes	System modifications as needed to accommodate any unique Avangrid, El Paso Electric, and WAPA Desert Southwest Region 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 Avangrid, El Paso Electric, and WAPA Desert Southwest Region.
Market Simulation	December 2022 thru January 2023
Parallel Operations	February 2023 thru March 2023

Milestone Type	Milestone Name	Dates		
		Avangrid	El Paso Electric	WAPA Desert Southwest Region
Market Sim	Market Sim Window	✓ Dec 2022 thru Jan 2023		
Parallel Operations	Parallel Operations	Feb 2023 thru Mar 2023		
Tariff	File Readiness Certification	Mar 2023		
Production	Activation	Apr 5, 2023		



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 independent 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
 - Bi-monthly review of market performance issues
 - High level discussion of release planning, implementation and new market
 enhancements



What to look for on the calendar...



