



# Release User Group Agenda

February 9, 2021

10:00 a.m.–11:00 a.m. (Pacific Time)

Web Conference Information	Conference Call Information
<p>Web Address: <a href="https://caiso.webex.com/meet/RUG">https://caiso.webex.com/meet/RUG</a> Meeting Number: 960 941 245</p> <p>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.</p>	<p><i>1-844-517-1271 US Toll Free</i> <i>+1-682-268-6591 US Toll</i> <i>Access code: 960 941 245</i></p>
<p>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.</p>	

# Release User Group Agenda

*February 9, 2021*

*10:00 a.m. – 11:00 a.m. (Pacific Time)*

<b>Time</b>	<b>Topic</b>	<b>Facilitator</b>
10:00 – 10:05	Agenda & ISO Roll call	Adrian Chiosea
10:05 – 10:45	Release Plan	Trang Vo Janet Morris Jeremy Malekos

# The ISO offers innovative training programs

Date	Training courses and workshops
February 25, 2021 (8:30am – 10:00am)	CIRA Enhancements ( <i>Virtual Training</i> )
February 25, 2021 (10:00am – noon)	Real-Time Settlements Review Training ( <i>Virtual Training</i> )
March 2-3, 2021 (9am – 12pm)	Intro to ISO Markets ( <i>Virtual Workshop</i> )
March 9-10, 2021 (9am – 12pm)	Market Transactions ( <i>Virtual Workshop</i> )
March 16-17, 2021 (9am – 12pm)	ISO Settlements ( <i>Virtual Workshop</i> )
Email us at <a href="mailto:CustomerReadiness@caiso.com">CustomerReadiness@caiso.com</a> for any training or readiness related questions	



[CustomerReadiness@caiso.com](mailto:CustomerReadiness@caiso.com)

## Computer Based Training

There are more than 20 computer based training modules on the ISO website covering: Markets and Operations, Settlements and Metering, Reference Materials, Western Energy Imbalance Market and more!

## New Modules (recorded webinar and slides)

You can now find the following new initiatives training courses on the learning center web page:

- |  |  |
|--|--|
| • ADS Training Part 1 & 2              | • RC Settlements                             |
| • DOT Tariff Clarification             | • FERC 841                                   |
| • Excess Behind the Meter Production   | • Market Settlements Timeline Transformation |
| • Flexible Ramping Product Refinements | • Intertie Deviation Settlement              |

Visit our **Learning Center** web page to access our training calendar, register for courses and find other informational resources:  
<http://www.caiso.com/participate/Pages/LearningCenter/default.aspx>

# Release Plan Summary: 2021

## Independent 2020 – Wrap-up

### Activation – Feb 2021

- Commitment Costs and Default Energy Bid Enhancements Phase 1
- ✓ ADS Decommission of Delphi Client, API v6
- ✓ Intertie Deviation Settlement
- ✓ EIM Enhancements Symmetrical Wheeling
- ✓ Energy Imbalance Market (EIM) Enhancements 2020 Phase 2

## Spring 2021

- FERC Order 831 - Compliance: Raise the Bid Cap to \$2000/MWh
- Energy Imbalance Market (EIM) 2021 - BANC Ph 2/WAPA, Turlock Irrigation District
- Energy Imbalance Market (EIM) 2021 - Public Service Company of New Mexico, North-Western Energy, Los Angeles Dept. of Water and Power
- EIM Enhancements 2021 Phase 1
- Base Schedule Submission Deadline Phase 1
- Real-Time Settlement Review Phase 1

## Summer 2021 - tentative, subject to change

- FERC Order 831 - Pricing Parameters, Import Bid Screening, and Validation
- Summer 2021 Readiness

## Independent 2021

- ✓ AIM Enhancements
- CIRA Enhancements
- Energy Imbalance Market (EIM) Enhancements 2020 Phase 3
- Aliso Canyon Phase 5
- System Market Power Mitigation Phase 1
- Enhancements to Scarcity Pricing Signals

# Release Plan Summary: 2021 - 2022

## Fall 2021

- Resource Adequacy (RA) Enhancements
- Energy Storage and Distributed Energy Resources Phase 4
- Flexible Ramping Product Refinements
- Hybrid Resources Phase 2
- Western EIM Sub-Entity Scheduling Coordinator Role
- EIM Enhancements 2021 Phase 2
- EIM Base Schedule Submission Deadline Phase 2
- Real-Time Settlement Review Phase 2
- Variable Operations and Maintenance Cost Review

## Spring 2022

- Energy Imbalance Market (EIM) 2022 - Avista
- Energy Imbalance Market (EIM) 2022 – Bonneville Power Administration
- Energy Imbalance Market (EIM) 2022 – Tacoma Power
- Energy Imbalance Market (EIM) 2022 – Xcel Energy - Colorado
- Energy Imbalance Market (EIM) 2022 - Tucson Electric Power

# 2020 Independent

# 2020 – Commitment Cost and Default Energy Bid Enhancements Ph1

Project Info	Details/Date
Application Software Changes	<p><b><u>Scope:</u></b>            Enhances the ability to submit market-based commitment cost bids in order to reflect unique costs and volatility:</p> <ul style="list-style-type: none"> <li>• Ex-ante cost adjustment requests</li> <li>• Reference Level Adjustments to default commitment cost bids (start-up and minimum load costs) and default energy bids</li> <li>• Make Day Ahead Market process permanent</li> <li>• Make D+2 Process permanent</li> <li>• Use of indices clarification, and Monday Only in DAM and RTM, per LMPME</li> <li>• Conditionally Available Resources (CAR)</li> </ul> <p><b><u>Impacted Systems:</u></b></p> <ul style="list-style-type: none"> <li>• SIBR: Allow the submittal of Ex Ante cost adjustments.</li> <li>• CMRI: Provide additional source information for default bids.</li> </ul> <p>Submit requests through CIDI for manual consultation and ex-post default bid adjustments.</p>
BPM Changes	<ul style="list-style-type: none"> <li>• Market Instruments</li> <li>• Market Operations</li> </ul>
Business Process Changes	<ul style="list-style-type: none"> <li>• Maintain Major Maintenance Adders (MMG LIII)</li> <li>• Maintain Negotiated Default Energy Bids (MMG LIII)</li> <li>• Maintain Negotiated O_Ms (MMG LIII)</li> <li>• Manage Day Ahead Market (MMG LII)</li> <li>• Manage Market Billing Settlements (MOS LII)</li> <li>• Manage Real Time Hourly Market (RTPD) (MMG LII)</li> <li>• Manage Real Time Operations – Maintain Balance Area (MMG LII)</li> </ul>
BRS	<p>Feb 2021 activation includes all scope in BRS 1.6</p> <p>CCDEBE-BRQ048: The initial value of the soft cap shall be set to \$1,000/MWh and the hard cap shall be set at \$1,000/MWh.</p> <p><b>Note: With the implementation of FERC No. 831 requirements, the hard cap will be set at \$2,000/MWh. Refer to FERC 831 BRS.</b></p>

# 2020 – Commitment Cost and Default Energy Bid Enhancements Ph1

Milestone Type	Milestone Name	Dates	Status
Draft Policy	Publish Draft Business Rules externally	Jan 31, 2018	✓
Board Approval	Obtain Board of Governors Approval	Mar 22, 2018	✓
External BRS	Publish External BRS v1.5: implementation notes & clarifications (BRQ046, BRQ035/335), Generic Hub GPI update	Sep 03, 2019	✓
	Revised BRS v1.6: added clarifications and notes	Sept 14, 2020	✓
Config Guides	Config Guide	N/A	
Tech Spec	Publish Technical Specifications	May 17, 2019	✓
	Publish Technical Specification updates for CARs and Electric Pricing Hub weighting	Jun 28, 2019	✓
Tariff	Collect stakeholder comments	Feb 21, 2020	✓
	Draft tariff conference call with stakeholders	Feb 27, 2020	✓
	Stakeholder call to review CCDEBE draft tariff re-filing	May 20, 2020	✓
	Publish updated draft tariff (reflecting 20-May feedback)	Jun 05, 2020	✓
	Refile CCDEBE tariff	Jul 09, 2020	✓
BPMs	Publish draft Market Instruments: Attachment O on CCDEBE Stakeholder Processes page	Oct 04, 2019	✓
	PRR 1203 published: CCDEBE updates to Market Instruments BPM, incl. Attachment O	Oct 18, 2019	✓
External Training	Deliver External Training	Oct 08, 2019	✓
	Finalize external training material	Oct 04, 2019	✓
Market Sim	Market Sim Window	Oct 14, 2019 - Dec 03, 2019	✓
	Market Sim Window – New SIBR rules	Dec 3, 2020 – Dec 18, 2020	✓
Production Activation	CCDEBE Phase 1	No later than Feb 24, 2021	

## 2020 – Commitment Cost and Default Energy Bid Enhancements Ph1

The ISO will issue a subsequent notice to confirm the actual implementation date at least two days in advance of that date.

**CIDI:**  
Customer Service Notice will announce that manual reference level adjustment requests can be submitted through a CIDI ticket by selecting the Manual Reference Level Change Request radio button, as explained in the BPM for Market Instruments, Attachment O. CIDI can also be used to submit after-market cost recovery requests and will also be used to contact SCs to initiate audit of automated reference level change requests which were submitted via SIBR.

# 2021 Spring Release

# Spring 2021 - FERC Order 831 - Compliance: Raise the Bid Cap to \$2000/MWh

Project Information	Details/Date
<b>High Level Business Problem or Need</b>	<ul style="list-style-type: none"> <li>The CAISO submitted its proposed tariff changes to comply with FERC Order No. 831 in September 2019. In its proposed tariff changes, the CAISO did not submit a separate filing requesting authority to cost-verify or price screen import bids above \$1,000/MWh. However, the CAISO decided to further address this topic in this initiative because of the CAISO balancing authority area's increasing dependence on imports.</li> <li>In addition, a number of stakeholders objected to the CAISO's proposal in the compliance filing to continue to set the power balance constraint penalty price at the hard energy bid cap, which under Order No. 831 increases from \$1,000/MWh to \$2,000/MWh. This would result in market prices being set to \$2,000/MWh if the market has to relax the power balance constraint. Consequently, this initiative also addresses this topic.</li> </ul>
<b>High Level Project Scope</b>	<ul style="list-style-type: none"> <li>The FERC 831 Import Bidding and Market Parameters project focuses on process and system modifications related to CAISO's Federal Energy Regulatory Commission (FERC) Order No. 831 compliance filing. In its compliance filing, CAISO revised the tariff to raise the energy bid cap from \$1,000/MWh to \$2,000/MWh. CAISO also revised the tariff to require suppliers within the CAISO balancing authority area (BAA), that submit energy bids above \$1,000/MWh, to base bids on verifiable actual or expected costs.</li> <li>The CAISO's associated policy initiative objective is to ensure all supply bids priced above \$1,000/MWh represent verified costs, when supply is needed to meet the ISO's load responsibility.</li> <li>The FERC 831 project addresses two topics related to the changes CAISO proposed:             <ul style="list-style-type: none"> <li>A price-screening methodology for import bids greater than \$1,000/MWh.</li> <li>The "penalty prices" at which CAISO markets will relax market constraints under the increased energy bid cap.                 <ul style="list-style-type: none"> <li>A methodology to establish market constraint relaxation penalty prices under a \$2,000/MWh hard energy bid cap.</li> </ul> </li> </ul> </li> </ul>
<b>Tariff Change</b>	<p>Section 30, Section 27.4.3, 27.4.3.1 thru .5, Appendix C Part B ;            See <a href="#">FERC Filing - Petition for Waiver to Extend Date of FERC Order No. 831 Compliance Filing – market notice</a></p> <p>"The California ISO is planning to file tariff revisions for the Federal Energy Regulatory Commission (FERC) Order No. 831 - Import Bidding and Market Parameters initiative in February 2021 in order to implement this initiative by June 2021. Separately, the ISO must comply with the directives of FERC Order No. 831 by March 21, 2021. These directives include allowing for cost justified energy bids above \$1,000 MWh from resources and sets the ISO's maximum energy bid at \$2,000 MWh. Pursuant to the directives of FERC Order No. 831, the maximum energy bid for import bids, virtual bids and demand bids will rise from \$1,000 MWh to \$2,000 MWh without any need to cost-justify those bids. In addition, the parameters the ISO uses for establishing market prices in certain instances under its tariff will also reflect the \$2,000 MWh maximum energy bid. The ISO has filed a petition for limited waiver to extend the date on which it must comply with these directives in order to implement them simultaneously with the ISO's FERC Order No. 831 – Import Bidding and Market Parameters Initiative. If granted, this petition would allow the ISO to implement the March 21 compliance revisions in June simultaneously with the ISO's enhancements."</p>
<b>Impacted Systems</b>	SIBR, IFM / RTM

# Spring 2021 - FERC Order 831 - Compliance: Raise the Bid Cap to \$2000/MWh (cont'd)

System	High Level Changes
SIBR	<ul style="list-style-type: none"> <li>• Hard cap \$2000 (parameter change)</li> <li>• The following is being delivered with CCDEBE functionality:                             <ul style="list-style-type: none"> <li>• Soft cap \$1000</li> <li>• Generators can bid up to their DEB if they bid above \$1000.</li> <li>• Interties, Virtuals, and Load can all bid to \$2000 without any restrictions.</li> </ul> </li> </ul>
IFM / RTM	<ul style="list-style-type: none"> <li>• DA and RT market applications scale scheduling and pricing run constraint penalty prices to be consistent with a \$2000 hard energy bid cap.</li> </ul>

Milestone Type	Milestone Name	Dates	Status
External BRS	Milestone: Post External BRS	Dec 21, 2020	✓
Production Activation	FERC Order 831 - Compliance: Raise the Bid Cap to \$2000/MWh	June 2021 / Mar 21, 2021	

# Spring 2021 – EIM integrations for BANC Phase 2, TID, PNM, LADWP, and NWE

Project Info	Details/Date
Application Software Changes	Implementation of BANC Phase 2, TID, PNM, LADWP, and NWE as EIM Entities
BPM Changes	EIM BPM will be updated if needed to reflect new modeling scenarios identified during implementation and feedback from BANC Phase 2, TID, PNM, LADWP, and NWE.
Market Simulation	December 2020 – January 2021
Parallel Operations	February 2021 – March 2021

Milestone Type	Milestone Name	Dates					Status
		BANC Phase 2	TID	PNM	LADWP	NWE	
Market Sim	Market Sim Window	11/3/20 - 1/31/21	11/3/20 - 1/31/21	11/3/20 - 1/31/21	11/3/20 - 1/31/21	12/1/20 - 1/31/21	✓
Parallel Operations	Parallel Operations	1/27/21 – 3/25/21	1/27/21 – 3/25/21	1/30/20 – 4/1/21	1/30/20 – 4/1/21	1/30/20 – 4/1/21	
Tariff	File Readiness Certification	Mar 2021					
Production	Activation	3/25/21	3/25/21	4/1/21	4/1/21	4/1/21	

# Spring 2021 – Base Schedule Submission Deadline Phase 1

Project Information	Details/Date
<b>High Level Business Problem or Need</b>	<ul style="list-style-type: none"> <li>• Provide EIM Scheduling Coordinators with additional flexibility to submit more accurate base schedules closer to the operating hour.</li> <li>• Update tariff rules and market systems to allow EIM Entities to submit base schedules with energy below a resource's minimum load.</li> <li>• Allow CAISO and EIM Entities to more accurately capture the startup energy of large conventional resources within their Resource Sufficiency Evaluations (RSE), thus increasing their ability to pass the RSE while lowering their exposure to uninstructed imbalance energy settlement.</li> </ul> <p>*across Phase 1 &amp; 2</p>
<b>High Level Project Scope</b>	<p><b>Phase 1:</b> Inclusion of startup energy below a resource's minimum load:</p> <ul style="list-style-type: none"> <li>• Include startup energy in an EIM base schedule               <ul style="list-style-type: none"> <li>○ Include startup energy in the resource sufficiency evaluation (RSE)</li> <li>○ Reduction of imbalance energy settlement</li> </ul> </li> </ul> <p><b>Phase 2, Fall 2021:</b> Updates to the base schedule submission timeline</p> <ul style="list-style-type: none"> <li>• Move market closing for the final binding EIM base schedule submissions from T-40 to T-30 -               <ul style="list-style-type: none"> <li>○ Adding additional RSE at T-40</li> </ul> </li> </ul>
<b>BPM Changes</b>	<p>EIM Market Instruments Market Operations Settlements</p> <p>*across Phase 1 &amp; 2</p>
<b>Tariff Change</b>	<p>11.8.6.3 BCR Settlement 29.11 Startup Energy Settlement 29.34 Base Schedules below Pmin and Submission Timeline Adjustment</p> <p>*across Phase 1 &amp; 2</p>
<b>Impacted Systems</b>	<p><b>Phase 1:</b> RTM, Settlements, BSAP, RCBSAP, CMRI</p> <p><b>Phase 2, Fall 2021:</b> RTM, BSAP, ITS, CMRI</p>

# Spring 2021 – Base Schedule Submission Deadline Phase 1 (cont'd)

System	High Level Changes
RTM	<p><b>Phase 1:</b></p> <ul style="list-style-type: none"> <li>• Include startup energy in balancing test only for EIM entities</li> <li>• EIM RSE to include energy below minimum load (startup energy) would only be on the balancing test</li> <li>• Startup energy will not be included as part of CAISO's RSE</li> </ul> <p><b>Phase 2, Fall 2021:</b></p> <ul style="list-style-type: none"> <li>• Shorten the run time of the current T-37.5 RTPD interval</li> <li>• Move start time to after T-30</li> <li>• Result publication remains at T-22.5</li> <li>• Final RSE will begin following T-30 deadline</li> <li>• Add additional RSE test</li> </ul>
Settlements	<p><b>Phase 1:</b></p> <ul style="list-style-type: none"> <li>• Settlements will treat startup energy as part of a EIM base schedule (not paid/charged for energy)</li> <li>• Deviations from the base schedule to be settled as uninstructed imbalance energy (UIE)</li> <li>• The intervals where BASE Schedules reflect Start Up Energy, should be considered self-committed startups</li> <li>• Startup energy will not be included as part of CAISO's RSE</li> <li>• Update calculation for Bid Cost Recovery (BCR) transfer amounts (if this initiative precedes Real-Time Settlements initiative then requirements will be taken from Real-Time Settlement initiative for the BCR calculation)</li> </ul>
BSAP	<p><b>Phase 1:</b></p> <ul style="list-style-type: none"> <li>• Modify the logic of the BSAP to allow for startup energy to be submitted as part of an EIM entity's base schedule</li> <li>• EIM base schedules to include a resources entire energy output, including portions below minimum load</li> </ul> <p><b>Phase 2, Fall 2021:</b></p> <ul style="list-style-type: none"> <li>• Send base schedule to market at T-30</li> </ul>
RCBSAP	<p><b>Phase 1:</b></p> <p>Modify the logic of the RCBSAP to allow for startup energy to be submitted as part of an EIM entity's base schedule</p>
ITS	<p><b>Phase 2, Fall 2021:</b></p> <ul style="list-style-type: none"> <li>• ITS will need to adjust the timing of RTPD publication checks and adjustments to account for the RTPD change from T-37.5 RTPD to T-30</li> <li>• RTPD 5 run will be decreased to around five and a half minutes</li> <li>• RTPD 5 run will be considered late at T-22.5</li> <li>• RTPD 4 should start at T-21.5</li> <li>• Payload times need to be adjusted</li> </ul>
CMRI	<p><b>Phase 1:</b></p> <ul style="list-style-type: none"> <li>• Leverage existing EIM Base Schedule report in CMRI</li> </ul> <p>Base schedule energy below Pmin reflected</p> <p><b>Phase 2, Fall 2021:</b></p> <ul style="list-style-type: none"> <li>• Additional payload consumed at T-30 for test results</li> <li>• Receive results from RTPD 5 run by T-22.5</li> </ul>

## Spring 2021 – Base Schedule Submission Deadline Phase 1 (cont'd)

Milestone Type	Milestone Name	Dates	Status
Board Approval	Obtain Board of Governors Approval	Dec 17, 2020	✓
External BRS	Milestone: Post External BRS	Jan 15, 2021	✓
Config Guides	Post Draft Config Guides	Jan 19, 2021	✓
Tech Spec	Create ISO Interface Spec (Tech spec)	N/A	
Tariff	File Tariff	Jan 27, 2021	✓
BPMs	Post Draft BPM changes	Feb 19, 2021	
External Training	Deliver External Training	Mar 08, 2021	
Production Activation	EIM Base Schedule Submission Deadline Spring	Apr 01, 2021	

# Spring 2021 – Real-Time Settlement Review Phase 1

Project Information	Details/Date
High Level Business Problem or Need	<p>The scope of this initiative is to identify and address any inappropriate cost shifting that may be occurring in ISO's real-time market between the Western Energy Imbalance Market (EIM) balancing authority areas.</p> <p>*across Phase 1 &amp; 2</p>
High Level Project Scope	<p><b>Phase 1:</b></p> <ul style="list-style-type: none"> <li>Eliminate the option for EIM entities to settle their base ETSR schedule deviations bilaterally. Deviations will be settled through the CAISO market at scheduling point intertie prices at a unique pricing location (LMP)</li> <li>Calculation changes for real-time bid cost recovery (BCR) uplift costs for EIM transfers. Allocate real-time BCR uplift costs to load and exports.</li> </ul> <p><b>Phase 2, Fall 2021:</b></p> <ul style="list-style-type: none"> <li>Allow EIM entities using a load derivation approach the option to not settle unaccounted for energy (UFE).</li> </ul>
Impacted Systems	<p>Master File, BSAP, Settlements</p> <p>*across Phase 1 &amp; 2</p>
System	High Level Changes
	*across Phase 1 & 2
Master File	<ul style="list-style-type: none"> <li>Establish base energy transfer system resources (ETSR) at a transfer location between EIM BAAs and default the Settlement Flag = Y</li> </ul>
Base Schedule Aggregation Portal (BSAP)	<ul style="list-style-type: none"> <li>Set transmission loss percentage to zero for calculating the hourly load base schedule for EIM entities the elect not to settle UFE.</li> </ul>
Settlements	<ul style="list-style-type: none"> <li>Configuration changes for unaccounted for energy (UFE) – CAISO to exclude EIM entities that elect to not settle UFE from calculation of UFE amount.</li> <li>Configuration changes for Bid Cost Recovery (BCR) – CAISO to update EIM RT BCR Uplift formula to remove uninstructed imbalance energy (UIE) and unaccounted for energy (UFE) and replace with Load and Exports.</li> </ul>

# Spring 2021 – Real-Time Settlement Review Phase 1 (cont'd)

Milestone Type	Milestone Name	Dates	Status
External BRS	Milestone: Post External BRS	Jan 21, 2021	✓
Config Guides	Post Draft Config Guides	Jan 19, 2021	✓
Market Sim	Market Sim Window	Mar 01, 2021 - Mar 19, 2021	
Production Activation	Real-Time Settlement Review Phase 1	Apr 01, 2021	

# 2021 Summer Release

# Summer 2021 – Summer 2021 Readiness

Initiative definition in the policy process at

[caiso.com > Stay Informed > Stakeholder Initiatives Market enhancements for summer 2021 readiness](https://www.aiso.com/Stay-Informed/Stakeholder-Initiatives/Market-enhancements-for-summer-2021-readiness)

Project Information	Details/Date
<b>High Level Business Problem or Need</b>	A historic heat storm impacted the western US for several consecutive days in mid-August 2020, causing energy supply shortages that led to two rotating power outages in the ISO footprint on August 14 and 15. ISO commits to the development of actions to prevent supply gaps in advance of summer 2021. This initiative focuses on near-term efforts on market rules, procedural changes, and resource adequacy necessary to manage heat events next summer.
<b>High Level Project Scope</b>	<ul style="list-style-type: none"> <li>• Export and load scheduling priorities</li> <li>• Including reliability demand response resources in real-time pre-dispatch</li> <li>• Management of storage resources during tight conditions</li> <li>• Import and export market incentives during tight system conditions</li> <li>• EIM coordination and resource sufficiency test review</li> <li>• New OASIS report showing gross exports and imports by intertie</li> <li>• Planned outage substitution</li> <li>• Resource adequacy capacity validation for load at 8 PM</li> <li>• CIRA Notifications</li> <li>• Addressing 15% PRM</li> </ul>
<b>BPM Changes</b>	Energy Imbalance Market (EIM), Market Instruments, Market Operations, Reliability Requirements, Settlements and Billing,
<b>Tariff Change</b>	Tariff sections: 4.13.3, 11.6.4, 29.7, 29.34, 30.6, 31.4, 34.4, 34.8, 34.12, 34.22, 40.4, 40.6, Sections L.1.6 of Appendix L, Section 4 of Appendix DD
<b>Impacted Systems</b>	ALFS, SIBR, CIRA, IFM/RTN, Master File, OASIS, OMS, RTM, Settlements.

# Summer 2021 – Summer 2021 Readiness

Milestone Type	Milestone Name	Dates	Status
Board Approval	Obtain Board of Governors Approval	Mar 25, 2021	
External BRS	Post External BRS	Mar 30, 2021	
Config Guides	Post Draft Config Guides	Apr 05, 2021	
Tech Spec	Publish Technical Specifications	Apr 05, 2021	
Tariff	FERC Filing	Apr 01, 2021	
BPMs	Post Draft BPM changes	Apr 20, 2021	
External Training	Deliver External Training	Apr 29, 2021	
Market Sim	Market Sim Window	May 03, 2021 - May 21, 2021	
Production Activation	Summer 2021 Readiness Initiative	Jun 01, 2021	

# Summer 2021 - FERC Order 831 - Pricing Parameters, Import Bid Screening, and Validation

Project Information	Details/Date
<b>High Level Business Problem or Need</b>	<ul style="list-style-type: none"> <li>The CAISO submitted its proposed tariff changes to comply with FERC Order No. 831 in September 2019. In its proposed tariff changes, the CAISO did not submit a separate filing requesting authority to cost-verify or price screen import bids above \$1,000/MWh. However, the CAISO decided to further address this topic in this initiative because of the CAISO balancing authority area's increasing dependence on imports.</li> <li>In addition, a number of stakeholders objected to the CAISO's proposal in the compliance filing to continue to set the power balance constraint penalty price at the hard energy bid cap, which under Order No. 831 increases from \$1,000/MWh to \$2,000/MWh. This would result in market prices being set to \$2,000/MWh if the market has to relax the power balance constraint. Consequently, this initiative also addresses this topic</li> </ul>
<b>High Level Project Scope</b>	<ul style="list-style-type: none"> <li>The FERC 831 Import Bidding and Market Parameters project focuses on process and system modifications related to CAISO's Federal Energy Regulatory Commission (FERC) Order No. 831 compliance filing. In its compliance filing, CAISO revised the tariff to raise the energy bid cap from \$1,000/MWh to \$2,000/MWh. CAISO also revised the tariff to require suppliers within the CAISO balancing authority area (BAA), that submit energy bids above \$1,000/MWh, to base bids on verifiable actual or expected costs.</li> <li>The CAISO's associated policy initiative objective is to ensure all supply bids priced above \$1,000/MWh represent verified costs, when supply is needed to meet the ISO's load responsibility.</li> <li>The FERC 831 project addresses two topics related to the changes CAISO proposed:             <ul style="list-style-type: none"> <li>A price-screening methodology for import bids greater than \$1,000/MWh.</li> <li>The "penalty prices" at which CAISO markets will relax market constraints under the increased energy bid cap.                 <ul style="list-style-type: none"> <li>A methodology to establish market constraint relaxation penalty prices under a \$2,000/MWh hard energy bid cap.</li> </ul> </li> </ul> </li> </ul>
<b>BPM Changes</b>	Market Instruments, Market Operations, Definitions & Acronyms
<b>Tariff Change</b>	<p>Section 30, Section 27.4.3, 27.4.3.1 thru .5, Appendix C Part B ;            See <a href="#">FERC Filing - Petition for Waiver to Extend Date of FERC Order No. 831 Compliance Filing – market notice</a></p> <p>"The California ISO is planning to file tariff revisions for the Federal Energy Regulatory Commission (FERC) Order No. 831 - Import Bidding and Market Parameters initiative in February 2021 in order to implement this initiative by June 2021. Separately, the ISO must comply with the directives of FERC Order No. 831 by March 21, 2021. These directives include allowing for cost justified energy bids above \$1,000 MWh from resources and sets the ISO's maximum energy bid at \$2,000 MWh. Pursuant to the directives of FERC Order No. 831, the maximum energy bid for import bids, virtual bids and demand bids will rise from \$1,000 MWh to \$2,000 MWh without any need to cost-justify those bids. In addition, the parameters the ISO uses for establishing market prices in certain instances under its tariff will also reflect the \$2,000 MWh maximum energy bid. The ISO has filed a petition for limited waiver to extend the date on which it must comply with these directives in order to implement them simultaneously with the ISO's FERC Order No. 831 – Import Bidding and Market Parameters Initiative. If granted, this petition would allow the ISO to implement the March 21 compliance revisions in June simultaneously with the ISO's enhancements."</p>
<b>Impacted Systems</b>	SIBR, IFM/RTM, OASIS

# Summer 2021 - FERC Order 831 - Pricing Parameters, Import Bid Screening, and Validation (cont'd)

System	High Level Changes
SIBR	<ul style="list-style-type: none"> <li>Hard cap \$2000 (parameter change)</li> <li>The following is being delivered with CCDEBE functionality:                             <ul style="list-style-type: none"> <li>Soft cap \$1000</li> <li>Generators can bid up to their DEB if they bid above \$1000.</li> <li>Interties, Virtuals, and Load can all bid to \$2000 without any restrictions.</li> </ul> </li> <li>Rule change: For an import bid of non-resource specific RA resource, the System shall limit the resource to the higher of the soft bid cap or the max import bid price.</li> <li>Rule change: When the maximum import bid price is greater than \$1000/MWh, or a cost verified resource bid is greater than \$1000/MWh, the System shall allow a non-resource specific non-RA import and virtual bids to bid up to the hard energy bid cap price.</li> </ul>
IFM / RTM	<ul style="list-style-type: none"> <li>DA and RT market applications receive maximum import bid prices calculated from ECIC.</li> <li>RT market applications receive EIM BAA-specific constraint relaxation thresholds from the master file.</li> <li>DA and RT markets define the high bid cap condition for a given hour as: maximum import bid price or cost-verified resource bid is greater than \$1000.</li> <li>DA market scales scheduling and pricing run constraint penalty prices to be consistent with a \$2000 bid cap when the high bid cap condition holds during any hour in time horizon. Otherwise, current scaling is used.</li> <li>RT market scales scheduling and pricing run constraint penalty prices to be consistent with a \$2000 bid cap when the high bid cap condition holds during any hour in the time horizon or held for the DA market. Otherwise, current scaling is used.</li> <li>When RT market uses constraint penalty prices scaled to be consistent with the \$2000 bid cap, and an EIM BAA has a power balance infeasibility less than or equal to its constraint relaxation threshold, the pricing run energy prices in that EIM BAA are set based on the highest-priced economic bid cleared in the scheduling run, but no lower than \$1000 when the infeasibility is positive.</li> </ul>
OASIS	<ul style="list-style-type: none"> <li>Publish the Hourly Energy Price Shaping Factor for day-ahead and real-time markets.</li> <li>Publish the static constraint relaxation threshold value(s) for the CAISO BAA and each EIM BAA annually.</li> </ul>

Milestone Type	Milestone Name	Dates	Status
External BRS	Milestone: Post External BRS	Dec 21, 2020	✓
Production Activation	FERC Order 831 - Pricing Parameters, Import Bid Screening, and Validation	Jun 2021	

# 2021 Independent

# 2021 - CIRA Enhancements

	CIRA Enhancements	MAP-Stage	Production
1	LSE IDs from Master File	Feb 16, 2021	Mar 3, 2021
2	CIRA Flex RA-Upload Screen & Flex Capacity Survey layer changes		
3	CIRA Acquired Resource (Phase 1)		
4	CIRA – Add SC Contact Info		
5	Publish NQC data to OASIS - this report will move from public website to a new report in OASIS (upcoming OASIS tech spec)		
6	Publish CPM to OASIS - this report will move from public website to a new report in OASIS (upcoming OASIS tech spec)		

- OASIS tech spec published **January 14** with TUG review **January 19**
- Training re: provisioning changes for the new CIRA LSE IDs were discussed during the AIM Enhancements training for UAAs **January 21**
- Customer training for these enhancements is scheduled for **February 25, tentative, will confirm via market notice**
- The enhancements will be available in MAP-Stage prior to Production
- For item 1, CIRA will cease to use the LSEID list in CIRA and will use the list in Masterfile and **this will require provisioning changes to prevent loss of access to CIRA**
  - ISO will contact impacted organization’s UAAs to reprovision to the new IDs to retain access to CIRA
  - ISO will validate that the organizations have been reprovisioned prior to go-live to prevent loss of access to CIRA
  - Please work with your UAA to Provision your LSEID for following roles:
    - EXTERNAL RA READ-ONLY
    - EXTERNAL RA READ-WRITE
  - The re-provisioning of the LSEID access to these roles are needed to retain access to see the data in several CIRA reports such as
    - RA Plan Upload/download
    - Generic Obligation Report
    - Flex Obligation Report

# 2021 - EIM Enhancements 2020: Inter-tie Multi-Stage Generator

Project Info	Details/Date
Application Software Changes	<p><b>Scope:</b> Support for modeling an Intertie Generating (TG) resource as an Intertie Multi-Stage Generator (TMSG) shall be added to allow for optimal coordination of the MSG schedule with its inter-temporal constraints between MSG configuration states that may have non-overlapping capacity ranges.</p> <p><b>IFM/RTN:</b> support inter-tie Multi-Stage Generator (TMSG) resource model under the rules defined in MF.</p> <p><b>MF:</b> support the modeling of the intertie generating resource as a multi-stage generator (TMSG)</p>
BPM Changes	<ul style="list-style-type: none"> <li>• Energy Imbalance Market</li> </ul>
Tariff Changes	<ul style="list-style-type: none"> <li>• N/A</li> </ul>

Milestone Type	Milestone Name	Dates	Status
Board Approval	Obtain Board of Governors Approval	N/A	
External BRS	Milestone: Post External BRS	Jun 19, 2020	✓
Tech Spec		N/A	
Tariff	File Tariff	N/A	
BPMs	Draft BPM changes - Market Instruments – PRR 1281	Aug 31, 2020	✓
External Training	Deliver External Training – coordinate via customer readiness EIM ops mtg		
Market Sim	Market Sim Window – unstructured	Feb 4 – Feb 18, 2021	
Production Activation	EIM Enhancements 2020 Phase 3	Mar 1, 2021	

# 2021 – Aliso Canyon Ph5

Project Info	Details/Date
Application Software Changes	<p><b>Scope:</b> This project will consider enhancements to the existing Dynamic Competitive Path Assessment (DCPA) and Gas Nomogram capabilities currently in production.</p> <p><b>This enhancement includes the effect of gas nomogram that limit the supply counter flow in the calculation of the Residual Supply Index (RSI) within the existing DCPA methodology.</b></p> <p><b>IFM/RTN:</b> Formulate and solve the linear programming problem for maximizing the Residual Supplier Index (RSI) for each binding constraint that DCPA is applied.</p> <p><b>SMDM:</b> Enhance the User Interface to include “All Markets” when the user is defining “Market” within the Curtailment to Process section.</p> <p><b>SMDM:</b> Creation of error message if the RT curtail type “incremental” or “absolute” are used and total curtailment is left null.</p>
BPM Changes	<ul style="list-style-type: none"> <li>Managing Full Network Model</li> <li>Market Operations</li> </ul>
Tariff Changes	<ul style="list-style-type: none"> <li>N/A</li> </ul>

Milestone Type	Milestone Name	Dates	Status
Board Approval	Obtain Board of Governors Approval - NO BOG Needed	N/A	
External BRS	Post External BRS	May 05, 2020	✓
Config Guides	Post Draft Config Guides	N/A	
Tech Spec	Publish Technical Specifications	N/A	
Tariff	File Tariff	N/A	
BPMs	Post Draft BPM changes	Jul 17, 2020	✓
External Training	Deliver External Training	N/A	
Market Sim	Market Sim Window	N/A	
Production Activation	Aliso Canyon Phase 5	TBD	

# 2021 – System Market Power Mitigation – Phase 1

Project Information	Details/Date
High Level Business Problem or Need	Provide effective measures against the exercise of market power
High Level Project Scope	<ul style="list-style-type: none"> <li>Implementing system-level mitigation in the real-time market</li> <li>Determining the circumstances in which the market power mitigation process will consider the CAISO balancing authority area to be import constrained or whether import constraints must be binding to apply mitigation</li> <li>Considering the appropriate quantities of supply included in calculating the residual supply index used for system-level market power mitigation measures</li> <li>Calculating the competitive LMP when the CAISO balancing authority area fails the system-level market power mitigation test</li> <li>Considering whether system-level market power mitigation applies to energy offers for resources within the CAISO balancing authority area.</li> </ul>
BPM Changes	Definitions & Acronyms, Market Instruments, Market Operations
Tariff Change	Section 30.5.7, Potentially Section 39.7
Impacted Systems	MRI-Settlements, RTM
System	High Level Changes
RTM	<u>HASP</u> <ul style="list-style-type: none"> <li>Receives input data and evaluates whether the system-level pivotal supplier test should be triggered for any of the HASP 15-minute binding intervals</li> <li>Perform the three-pivotal supplier test if it is triggered, including:                             <ul style="list-style-type: none"> <li>Calculate withheld capacity per EIM entity Scheduling Coordinator (SC) affiliate group</li> <li>Use withheld capacity to rank the top three potentially pivotal suppliers</li> <li>Calculate the Residual Supply Index (RSI) and respond accordingly</li> </ul> </li> </ul>
	<u>RTPD/RTD/STUC</u> <ul style="list-style-type: none"> <li>Receive the fixed mitigated bid sets from SMPM and use them appropriately, or identifying other bids to use if SMPM bid sets are not present</li> </ul>
	<u>RTM</u> <ul style="list-style-type: none"> <li>Display the SMPM results in a similar fashion as the LMPM display within the Market UI</li> </ul>
Settlements	<ul style="list-style-type: none"> <li>Calculate the rolling 3-month average load per LSE and publish to the market, after all T+9B statements on a given day are published</li> </ul>

# 2021 – Enhancements to Scarcity Pricing Signals

Project Information	Details/Date
<b>High Level Project Scope</b>	<p data-bbox="355 211 1348 234"><a href="http://www.aiso.com/Documents/Summer2021Readiness-MarketEnhancementsUpdate.html">http://www.aiso.com/Documents/Summer2021Readiness-MarketEnhancementsUpdate.html</a></p> <p data-bbox="355 268 1825 405">System market power mitigation and additional proposed changes to enhance scarcity pricing signals– Subject to approval by its Board of Governors, the ISO is targeting August 2021 for implementation of its proposed system market power mitigation rules along with the proposed scarcity pricing provisions to improve incentives and increase supply during tight system conditions. The ISO's system market power mitigation proposal is available at <a href="https://stakeholdercenter.aiso.com/StakeholderInitiatives/System-market-power-mitigation">https://stakeholdercenter.aiso.com/StakeholderInitiatives/System-market-power-mitigation</a>. The ISO's two proposed enhancements to scarcity pricing signals are:</p> <p data-bbox="355 439 1825 491">Information on these enhancements are available at <a href="https://stakeholdercenter.aiso.com/StakeholderInitiatives/Market-enhancements-for-summer-2021-readiness">https://stakeholdercenter.aiso.com/StakeholderInitiatives/Market-enhancements-for-summer-2021-readiness</a>.</p> <ul data-bbox="355 525 1607 662" style="list-style-type: none"><li data-bbox="355 525 1510 576">• improve day-ahead market scheduling incentives and incentives for resources to be available in real-time<ul data-bbox="452 554 1348 576" style="list-style-type: none"><li data-bbox="452 554 1348 576">• Scale RT market penalty prices relative to power balance constraint penalty price</li></ul></li><li data-bbox="355 611 1414 634">• improve real-time market incentives when grid operators arm load to meet contingency reserves<ul data-bbox="452 639 1607 662" style="list-style-type: none"><li data-bbox="452 639 1607 662">• Release contingency reserves at the bid cap when arming load to meet contingency reserve requirement</li></ul></li></ul>

# 2021 Fall Release

# Fall 2021 Release - Overview

	BOG	BRS	Config Guide	Tech Spec	Mkt Sim Scenarios	Draft Tariff	Draft BPMs	Training	Market Sim	Production Activation
<b>Fall 2020 Release</b>		04/01/21	05/28/21	05/28/21	05/25/21	06/26/21	07/19/21	07/19/21	Jul 26, 2021 - Sep 3, 2021	10/01/21
<b>Resource Adequacy (RA) Enhancements Phase 1</b>	Feb 2021	03/30/21							Jul 26, 2021 - Sep 3, 2021	10/01/21
<b>ESDER Phase 4</b>	9/30/20	02/03/21							Jul 26, 2021 - Sep 3, 2021	10/01/21
<b>Flexible Ramping Product Refinements</b>	9/30/20	01/28/21							Jul 26, 2021 - Sep 3, 2021	10/01/21
<b>Hybrid Resources Phase 2</b>	11/18/20	03/01/21							Jul 26, 2021 - Sep 3, 2021	10/01/21
<b>Western EIM Sub-Entity Scheduling Coordinator Role</b>	5/20/21								Jul 26, 2021 - Sep 3, 2021	10/01/21
<b>EIM Enhancements 2021 – Phase 2</b>	N/A	03/01/21							Jul 26, 2021 - Sep 3, 2021	10/01/21
<b>EIM Base Schedule Submission Deadline - Phase 2</b>	12/17/20	01/15/21							Jul 26, 2021 - Sep 3, 2021	10/01/21
<b>Real-Time Settlement Review Phase 2</b>	12/17/20	01/21/21							Jul 26, 2021 - Sep 3, 2021	10/01/21
<b>Variable O&amp;M CR</b>	11/18/20								Jul 26, 2021 - Sep 3, 2021	10/01/21

# Fall 2021 – Resource Adequacy (RA) Enhancements

Project Information	Details/Date
<b>High Level Project Scope</b>	<ul style="list-style-type: none"> <li>• Capacity Procurement Mechanism (CPM - for local availability limitations)</li> <li>• RA Import rules</li> <li>• Operationalizing Storage</li> <li>• Portfolio Assessment – Phase 1                             <ul style="list-style-type: none"> <li>• CIRA payload modifications</li> <li>• Update tool for new analysis</li> <li>• Incorporate planned outage process into portfolio analysis</li> </ul> </li> <li>• Unforced Capacity (UCAP) – Phase 1                             <ul style="list-style-type: none"> <li>• Set up systems to track resources' forced outage rates, supply cushion hours</li> <li>• Modifications to how OMS data is tracked and stored, alignment with RC definitions if not already aligned.</li> </ul> </li> </ul>
<b>BPM Changes</b>	Market Instruments, Reliability Requirements, Outage Management
<b>Tariff Change</b>	Yes
<b>Impacted Systems</b>	CIRA, OMS, RTM/IFM

# Fall 2021 – Resource Adequacy (RA) Enhancements (cont'd)

System	High Level Changes
<b>Customer Interface for Resource Adequacy (CIRA)</b>	<p><b>Unforced Capacity Evaluations (System RA) UCAP Phase 1:</b></p> <ul style="list-style-type: none"> <li>• Ability for Demand runs to calculate UCAP availability values</li> <li>• Outage data must be made readily available for end users</li> <li>• Calculate Supply cushion hours</li> <li>• Access to the daily RA data for calculation of the Supply Cushion hours excluding the Wind and Solar RA capacity.</li> <li>• Calculate the weighted average of the yearly historical Seasonal Average Availability Factor (SAAF) for the UCAP per resource (must maintain 5 years worth of historical data)</li> <li>• Calculate the class average rate for new resources that will be coming online</li> <li>• There will be a unique UCAP calculation methodology for the following resource types: Hybrid, DR, QF, Hydro, imports &amp; storage resources (unique fuel types)</li> <li>• UCAP calculations for Hybrid resources will require the Dynamic Limit functionality from the Real Time Market.</li> <li>• UCAP calculations for Hydro resources will require 10 years worth of bidding data (currently there are 3 years). Will leverage UCAP tool (using template) to obtain 10 years of bidding data from LSEs.</li> <li>• UCAP calculations for DR &amp; QF resources will require a metric to measure performance against dispatch instructions.</li> <li>• The system must calculate DR performance with respect to dispatch response (for the last 3 years).</li> <li>• UCAP calculations for imports will need an additional input if their transmission product is firm or non-firm (from source to sync) and if there was curtailment on the e-tag. Reason for needing if transmission product is firm or non-firm from source to sync will determine if curtailment derates the UCAP values.</li> <li>• For non dispatchable resources will have a different calculation methodology for UCAP (UCAP = NQC). Non dispatchable resources could be included in the future for the standard UCAP calculation.</li> <li>• Regarding Wind &amp; Solar resources, UCAP values = NQC.</li> <li>• For calculating Supply cushion hours, hourly net load is needed for UCAP calculation &amp; Contingency reserves.</li> </ul> <p><b>RA Import Rules:</b></p> <ul style="list-style-type: none"> <li>• Need to obtain transmission profile to showcase firm or non-firm transmission.</li> <li>• Allow Market participants to attest possible UI change. Need to determine how the attestation is viewed by Market Participants.</li> </ul>
<b>Outage Management System (OMS)</b>	<p><b>Unforced Capacity Evaluations (System RA) UCAP Phase 1:</b></p> <ul style="list-style-type: none"> <li>• In order to calculate supply cushion hours, system must provide hourly outage impact per resource (This is currently performed at daily level).</li> </ul> <p><b>Planned Outage Provisions:</b></p> <ul style="list-style-type: none"> <li>• Addition of validation rules to automatically deny planned outages without substitution.</li> </ul>
<b>Integrated Forward Market (IFM)/ Real Time Markets (RTM)</b>	<p><b>Operationalizing Storage:</b></p> <ul style="list-style-type: none"> <li>• Creation of a new energy constraint that at the end of the time horizon has a state of charge.</li> <li>• DA schedule for next several hours should have guaranteed delivery.</li> <li>• If the resource has a DA discharge schedule and shown for resource adequacy then its requirement is set.</li> </ul>

# Fall 2021 – Energy Storage and Distributed Energy Resources Phase 4

Project Information	Details/Date
<p><b>High Level Business Problem or Need</b></p>	<ul style="list-style-type: none"> <li>Number and diversity of NGR energy storage resources continue to grow and represent an important part of the future grid. This initiative focuses on lowering barriers and enhancing the ability of these resources to participate in the CAISO's market.</li> </ul>
<p><b>High Level Project Scope</b></p>	<p><b>Phase 4A:</b>  <b>For NGR energy storage resources (LESR non-REM only):</b>            Allowing End-Of-Hour (EOH) State-of-charge (SOC) biddable parameter in RTM.            Modification of Settlements RTM BCR to account for 1. EOH SOC, and 2. Self-Scheduling  <b>For PDR, PDR-LSR curtailment and RDRR resources:</b>            Considering Maximum Daily Run Time (MDRT) parameter.</p> <p><b>Phase 4B:</b>  <b>For NGR energy storage resources (LESR non-REM only):</b>            Enhanced DEB calculations for storage resources that take into account: 1. Energy Costs, 2. Variable Costs* (including Cell Degradation Cost), and 3. Opportunity Costs.  <b>Note:</b> This component may be removed for DAM in revised policy proposal per MSC recommendations.            Applying Market Power Mitigation (MPM).*  <b>Note:</b> Sufficiently small "Safe Harbor" resources may be still be exempted from bid mitigation in DAM and RTM in revised policy proposal per MSC recommendations.</p>
<p><b>BPM Changes</b></p>	<p>Demand Response, Energy Imbalance Market, Market Instruments, Market Operations, Settlements and Billing</p>
<p><b>Tariff Change</b></p>	<p>Section 4, 11, 30, 31, 34, 39, Appendix A, Appendix B</p>
<p><b>Impacted Systems</b></p>	<p>ALFS, CMRI, IFM, MF, OASIS, RTM, Settlements, SIBR</p>

# Fall 2021 – Energy Storage and Distributed Energy Resources Phase 4 (cont'd)

System	High Level Changes
<p><b>Integrated Forward Market (IFM)</b></p>	<ul style="list-style-type: none"> <li>• Calculate DEB for all storage resources to account for: 1. Energy cost, 2. Variable cost, and 3. Opportunity cost</li> <li>• Energy cost (including accounting for round-trip efficiency)             <ul style="list-style-type: none"> <li>○ Assume one cycle of charge/discharge per day.</li> <li>○ Assume charging during least expensive continuous LMP prices.</li> <li>○ Assume discharging during most expensive continuous LMP prices.</li> <li>○ Account for round-trip efficiency.</li> <li>○ For DA DEB:                 <ul style="list-style-type: none"> <li>➢ Use DA LMP from IFM-MPM pass.</li> </ul> </li> <li>○ For RTM DEB:                 <ul style="list-style-type: none"> <li>➢ Use actual binding DA LMP from same trade day IFM runs.</li> </ul> </li> </ul> </li> <li>• Applies to NGR LESR non-REM resources only.</li> <li>• For NGR LESR non-REM resources:             <ul style="list-style-type: none"> <li>○ EOH SOC does not apply to DAM.</li> <li>○ Apply MPM for the entire operating range (discharging and charging).</li> <li>○ <b>Note:</b> Per MSC recommendations, a “Safe Harbor” designation for some NGR storage resources that are sufficiently small according to a TBD criteria, will be needed so that these resources can be exempted from bid mitigation.</li> </ul> </li> <li>• For PDR, PDR-LSR curtailment and RDRR resources:             <ul style="list-style-type: none"> <li>○ Add Max Daily Run Time (MDRT) as constraint in the optimization. Null shall be considered as no constraint.</li> </ul> </li> <li>• <b>Variable cost</b> (including Cell degradation cost [also called Cycling Cost])             <ul style="list-style-type: none"> <li>○ Submitted by Resource SC via MF</li> </ul> </li> <li>• <b>Opportunity cost</b> <ul style="list-style-type: none"> <li>○ For DA DEB:                 <ul style="list-style-type: none"> <li>➢ Calculated as the fourth highest hourly DA LMP price of the previous trade day IFM scaled by the DA Bilateral hub index prices (DAB) between the two days.</li> <li>➢ <b>Note:</b> This component may be removed in revised policy proposal per MSC recommendations.</li> </ul> </li> <li>○ For RTM DEB:                 <ul style="list-style-type: none"> <li>➢ Calculated as the fourth highest hourly DA LMP price of the same trade day IFM.</li> </ul> </li> </ul> </li> <li>• Calculated DEB will be daily value for each storage resource (one value DAM and another for RTM).</li> <li>• If Negotiated Rate Option is chosen, the NDEB shall follow existing process same as non-storage resources.</li> <li>• <b>Note:</b> Per MSC recommendations, a “Safe Harbor” designation for some NGR storage resources that are sufficiently small according to a TBD criteria, will be needed so that these resources can be exempted from bid mitigation, and consequently, no need to calculate DEB for them.</li> <li>• Applies to NGR LESR non-REM resources only.</li> </ul>
<p><b>Automated Load Forecast System (ALFS)</b></p>	<ul style="list-style-type: none"> <li>• Forecasting tools need to be tuned to reflect changes of the way NGR storage get dispatched.</li> </ul>

# Fall 2021 – Energy Storage and Distributed Energy Resources Phase 4 (cont'd)

System	High Level Changes
<b>CAISO Market Results Interface (CMRI)</b>	<ul style="list-style-type: none"> <li>• Update Default Energy Bid Curve report to add new Default Bid Type for storage resources.</li> <li>• Applies to NGR LESR non-REM resources only.</li> </ul>
<b>Master File (MF)</b>	<ul style="list-style-type: none"> <li>• Define the following parameters for each NGR energy storage resource (LESR non-REM only) with an effective date:             <ul style="list-style-type: none"> <li>○ Variable Cost (including Cycling Cost [also called Cell Degradation Cost])</li> <li>○ Mapping between NGR energy storage resources and bilateral hub index (CE hub) <b>Note:</b> This functionality may be removed in revised policy proposal per MSC recommendations.</li> <li>○ SC for each NGR storage resource may rank its resource DEB option as:                 <ul style="list-style-type: none"> <li>➢ Storage Resource option</li> <li>➢ Variable Cost Option</li> <li>➢ LMP Option</li> <li>➢ Negotiated Rate Option</li> </ul> </li> <li>○ SC of NGR storage resource shall rank Storage Resource DEB option as first option in order to activate it.</li> <li>○ If no rank is specified for a NGR storage resource, then the default rank will be                 <ol style="list-style-type: none"> <li>1) Variable Cost Option</li> <li>2) Negotiated Rate Option</li> <li>3) LMP Option</li> </ol> </li> <li>○ <b>Note:</b> Per MSC recommendations, a “Safe Harbor” designation for some NGR storage resources that are sufficiently small according to BDC criteria will be needed so that these resources can be exempted from bid mitigation, and consequently, no need to calculate DEB for them.</li> </ul> </li> <li>• Define the following parameter for PDR, PDR-LSR curtailment and RDRR resources with an effective date:             <ul style="list-style-type: none"> <li>○ Max Daily Run Time (MDRT)                 <ul style="list-style-type: none"> <li>➢ Valid data are integers from 1 to 23 hours.</li> <li>➢ Represents maximum daily number of hours the resource can be committed and/or dispatched.</li> <li>➢ Optional parameter (shall be NULL, if not entered).</li> <li>➢ Applies to PDR, PDR-LSR curtailment, and RDRR resources only.</li> <li>➢ Applies only to resources with minimum of 1 MW curtailment capability and with registered Pmax &gt;= 1 MW.</li> <li>➢ Follow similar submission/update process as Maximum Daily Energy parameter.</li> </ul> </li> </ul> </li> </ul>

# Fall 2021 – Energy Storage and Distributed Energy Resources Phase 4 (cont'd)

System	High Level Changes
<b>Open Access Same Time Information System (OASIS)</b>	<ul style="list-style-type: none"> <li>• Publish masked hourly EOH SOC public bids for NGR energy storage resources on T+90 (90 days after the trade date).</li> <li>• Applies to NGR LESR non-REM resources only.</li> </ul>
<b>Real-Time Market (RTM)</b>	<ul style="list-style-type: none"> <li>• For NGR LESR non-REM resources:             <ul style="list-style-type: none"> <li>○ Add hourly EOH SOC Min and Max as constraints in the optimization.</li> <li>○ RTM shall dispatch resources economically or uneconomically to satisfy most restrictive constraints among ED HSOC constraints and registered and bid-in energy storage limits.</li> <li>○ ED HSOC constraints shall take precedence over economic outcome of the optimization, including but not limited to energy bid curve and ancillary services bid.</li> <li>○ Respecting ancillary services awards, schedules, and obligations take precedence over satisfying ED HSOC constraints. This also applies to awarded AS in lower markets.</li> <li>○ ED H constraint shall apply to the last market interval of the hour (e.g last 15-min for FMM [00:45-01:00] and last 5-min for RTD [00:55-01:00]).</li> <li>○ When the RTD end of horizon is earlier than the last interval of the hour where EOH SOC exist:                 <ul style="list-style-type: none"> <li>➢ Align ED HSOC constraints between FMM and RTD by adding implied End of Horizon SOC in RTD using ED HSOC and the schedule MW from FMM.</li> </ul> </li> <li>○ ED or MD shall have higher priority than meeting EOH SOC constraints.</li> <li>○ Apply LMPM to NGR energy storage resources for the entire operating range (discharging and charging).</li> <li>○ <b>Note:</b> Per NERC recommendations, a "Safe Harbor" designation for some NGR storage resources that are sufficiently small according to a TBD criteria, will be needed so that these resources can be exempted from bid mitigation.</li> </ul> </li> <li>• For PDR, PDR-LSR curtailment and RDRR resources:             <ul style="list-style-type: none"> <li>○ Add Max Daily Run Time (MDRT) for DR resources as constraint in the optimization. Null shall be considered as no constraint.</li> </ul> </li> </ul>

# Fall 2021 – Energy Storage and Distributed Energy Resources Phase 4 (cont'd)

System	High Level Changes
Settlements	<ul style="list-style-type: none"> <li>• For accepted RTM EOH SOC bids in an hour:               <ul style="list-style-type: none"> <li>◦ Disqualify the resource from receiving RTM Bid Cost shortfall for that hour and the previous hour (flagged hours).</li> </ul> </li> <li>• For RTM self-schedules in an hour:               <ul style="list-style-type: none"> <li>◦ Disqualify the resource from receiving RTM Bid Cost shortfall for the previous hour (flagged hour).</li> </ul> </li> <li>• The RTM bid cost/revenue shortfall assessment shall be evaluated at each 5-minute interval of the flagged hours.               <ul style="list-style-type: none"> <li>◦ If energy bid cost is &gt; than revenue (shortfall),                   <ul style="list-style-type: none"> <li>➢ this interval will be set to 0 in the daily BCR settlements;</li> </ul> </li> <li>◦ If energy bid cost is &lt;= revenue (surplus),                   <ul style="list-style-type: none"> <li>➢ there will be no change in this interval.</li> </ul> </li> </ul> </li> <li>• Existence of ED MD instruction shall nullify the new BCR rules similar to how ED MD instruction nullify existing RTM BCR rules for self-schedules resources.</li> <li>• RTM BCR rules applies to charging and discharging.</li> <li>• Business will verify that no rule changes to Metering Energy Adjustment Factors (MEAF).</li> <li>• There is no change to the AS award components of the RTM BCR settlement due EOH constraint or self-schedules.</li> <li>• There is no change to the DAM BCR settlement due EOH constraint or self-schedules.</li> <li>• <b>No impact for:</b> Exemption of variable output DERs that bids their true availability from RAAM similar to wind and solar is also be tied to EEC approach adoption by the CPUC and implementation of DAME and RAE initiatives.</li> <li>• Applies to NGR LESR non-REM resources only.</li> </ul>
Scheduling Infrastructure and Business Rules (SIBR)	<ul style="list-style-type: none"> <li>• Add optional Min and Max End-of-Hour (EOH) State of Charge (SOC) as hourly biddable real-time parameters (in MWh) for NGRs. <b>Note:</b> Does not apply to DA bids.</li> <li>• Add validation for Min EOH SOC &lt;= Max EOH SOC</li> <li>• Add validation for Min and Max EOH SOC to be within most restrictive of biddable Energy Storage Limits and MF registered Energy Storage Limits.</li> <li>• EOH SOC biddable parameters shall apply to NGR energy storage resources that have SOC management.</li> <li>• Do not send EOH SOC parameters to STUC in advisory payloads.</li> <li>• Applies to NGR LESR non-REM resources only.</li> <li>• <b>Note:</b> NGR energy storage resources shall not submit EOH SOC below Must Offer Obligation (MOO) or use it to withhold additional RA capacity that is not scheduled in IFM or RUC.               <ul style="list-style-type: none"> <li>◦ This is market monitoring task rather than a SIBR enforced rule. Need to align with RA Enhancements initiative project.</li> </ul> </li> </ul>

# Fall 2021 – Flexible Ramping Product Refinements

Project Information	Details/Date
<b>High Level Project Scope</b>	The scope of the project FRP Deliverability is: <ol style="list-style-type: none"> <li>1. Procurement of FRP for BAA's that fails the flex test is separate for each BAA.</li> <li>2. Procurement of FRP for BAA's that pass the flex test for the entire group of BAA.</li> <li>3. Transmission constraints and transfer limits are enforced in FRP deployment scenarios</li> <li>4. Distributing the uncertainty requirement in each BAA load and VER locations versus just load</li> <li>5. Distributing the demand curve surplus variable as a decision variable at load aggregation points (LAP) versus Balancing Authority Areas (BAA)</li> <li>6. To establish the Locational Marginal Capacity Prices (LMCP) for FRP</li> </ol>
<b>BPM Changes</b>	Market Instruments, Market Operations
<b>Tariff Change</b>	Yes
<b>Impacted Systems</b>	RTM, Settlements, CMRI/OASIS

# Fall 2021 – Flexible Ramping Product Refinements (cont'd)

System	High Level Changes
<b>Real Time Markets (RTM)</b>	<ul style="list-style-type: none"> <li>• RTM to be impacted based on the change in the FRP procurement systems.</li> <li>• Input data needed for forecasted advisory in the binding interval for RTPD for approx. 40 work days or weekends.</li> <li>• New demand curve calculation is needed.</li> </ul>
<b>Settlements</b>	<ul style="list-style-type: none"> <li>• Prices are nodal therefore mechanics for cost allocation pricing to be changed</li> <li>• Nodal FRP prices</li> </ul>
<b>CAISO Market Results Interface (CMRI)/ Open Access Same time Information (OASIS)</b>	<ul style="list-style-type: none"> <li>• Publish Resource Nodal prices for the FRP awards (CMRI)</li> <li>• Publish requirements for FRP per BAA and BAA group (OASIS)</li> <li>• Publish surplus by LAP (OASIS)</li> <li>• Publish the nodal FRP prices (OASIS)</li> </ul>

# Fall 2021 – Hybrid Resources Phase 2

Project Information	Details/Date
<b>High Level Business Problem or Need</b>	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 project participation (hybrid and co-located resources) in the ISO markets.
<b>High Level Project Scope</b>	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.
<b>BPM Changes</b>	Direct Telemetry, Market Instruments, Market Operations, Metering, Settlements and Billing
<b>Tariff Change</b>	Section 39, Appendix Q
<b>Impacted Systems</b>	ALFS, CMRI, Reporting, IFM/RTM, MF, OASIS, RIMS, Settlements, MRI-S Metering, SIBR

## Fall 2021 – Hybrid Resources Phase 2 (cont'd)

System	High Level Changes
<b>Automated Load Forecast System (ALFS)</b>	<ul style="list-style-type: none"> <li>• Identification of variable energy resources (VER)</li> <li>• New forecast type for hybrid resources</li> <li>• Forecast for hybrid resources that elect for ISO forecast</li> </ul>
<b>CAISO Market Results Interface (CMRI)</b>	<ul style="list-style-type: none"> <li>• Updates to include resource specific forecast data for hybrid resources (VER components).</li> </ul>
<b>Reporting</b>	<ul style="list-style-type: none"> <li>• Potential: Update report(s) for resource tagging changes: Solar Total tag, Wind Total Tag, Battery Total Tag (Renewable watch, Curtailment Report, ISO Today), and new Hybrid Total Tag</li> </ul>
<b>Integrated Forward Market (IFM)/Real-Time Market (RTM)</b>	<ul style="list-style-type: none"> <li>• When any resource behind an ACC constraint has an AS award, all resources behind that ACC constraint must follow their DOT and receive the must follow flag</li> <li>• Create a new user interface to display the hybrid summary</li> <li>• Include dispatchable generation calculation in RTD and RTPD for co-located resources</li> <li>• Modify 'Must Follow DOT' flag for AS cleared or AS dispatched award <ul style="list-style-type: none"> <li>◦ Must Follow DOT Flag must turn to 'Y' for Ancillary Service Cleared by resource ID</li> </ul> </li> <li>• HSL needs to be integrated with the persistent methodology for co-located resources: Validation rules must be developed for the HSL</li> <li>• Validate the dynamic operating limits</li> <li>• Software that takes the submitted limit and haircuts the energy bid used in each interval of the market time horizon</li> <li>• Limit the economic dispatch of a hybrid resource in the real-time market based on data submitted to SIBR</li> <li>• For co-located resources and hybrids, add new user interfaces</li> <li>• Dynamic Limit functionality: <ul style="list-style-type: none"> <li>• Display a hybrid resources upper limit and lower limit</li> <li>• Display VER availability</li> <li>• Display ambient derates</li> </ul> </li> <li>• Provide the capability to submit energy-not-available thru the functionality</li> </ul>

## Fall 2021 – Hybrid Resources Phase 2 (cont'd)

System	High Level Changes
<b>Master File (MF)</b>	<ul style="list-style-type: none"> <li>Enhance MF to identify Hybrid resources</li> <li>Create a new categorization in MF to identify hybrid resources to handle dynamic limits</li> <li>Add the ability to store the state-of-charge minimum and maximum limit</li> <li>Identification of variable energy resources (VER)</li> <li>Enhance MF to map hybrid resource to individual VER component(s)</li> <li><b>Note:</b> Renewable registration for VER components is currently mapped to Resource ID; will need further automation to map to individual VER component</li> <li>New unit type to identify a hybrid resource under the existing NGR model</li> <li>New identification of individual renewable components that make up a hybrid resource</li> <li>Ability to elect for ISO forecast or SC submitted forecast to be at the renewable component level</li> <li>Make the new categorization of hybrid resources along with associated attributes available for downstream applications</li> <li>Add a MF rule to make sure the 'MOO Qualified Flag' is set to "N" for hybrid resources</li> <li>Modifications to support the need for a few MF resource attributes (for example, fuel type, technology type, QF Flag, VER NGR flag, etc.) that need to be associated to the VER components that make up the hybrid resources</li> <li>Map PI Tags (VER actual and meteorological tags) to each Resource ID or VER component. <b>Note:</b> System to be determined per Architecture Definition</li> </ul>
<b>Open Access Same Time Information (OASIS)</b>	<ul style="list-style-type: none"> <li>Updates to create a new category for hybrid resources to be included in the forecast data reports.</li> </ul>
<b>Settlements</b>	<ul style="list-style-type: none"> <li>Consume new VER Component ID for forecasting fee</li> <li>Updates to forecast fee calculation based on meter data submitted for the VER components that elect ISO forecast</li> </ul>
<b>Metering (MRI-S)</b>	<ul style="list-style-type: none"> <li>Ability to receive meter data at the VER Component ID level for hybrid resources</li> <li>Updates for Western Renewable Energy Generation Information System (WREGIS) reporting of meter data on the Hybrid components</li> </ul>
<b>Scheduling Infrastructure and Business Rules (SIBR)</b>	<ul style="list-style-type: none"> <li>Treat all hybrid resources as non REM NGRs</li> <li>Flagging must be configured to ensure bid insertion does not occur</li> <li>SIBR rules and new rule flow needs to be created to receive and validate the dynamic operating limits</li> <li>Software that allows market participant to submit their dynamic limit</li> <li>Allow submission of upper and lower economic limits for each 5-minute interval in a three hour window for hybrid resources</li> <li>Validation of upper and lower economic limits</li> <li>Validate the dynamic operating limits</li> </ul>

# Fall 2021 – Hybrid Resources Phase 2 (cont'd)

System	High Level Changes
<b>Resource Interconnection Management System (RIMS)</b>	<ul style="list-style-type: none"> <li>• Enhance to identify Hybrid resources</li> <li>• RIMS will need to add a new Milestone type under App &amp; Study &gt; Project Summary &gt; Status Report and Milestones: add Milestone Type “Co-located / Hybrid”</li> <li>• Under MPAL &gt; General Info, below the drop box for additional fuel type, add “Co-located/Hybrid:” and add a drop down box with three choices – blank, “Co-located” and “Hybrid.” App &amp; Study will provide this information to MPAL when the project is pulled from App &amp; Study.</li> <li>• Collect topographical map and Site Information for hybrid resources</li> <li>• Reference Tariff Appendix Q: Automation of existing manual processes for all renewable resources (resources ID or VER component) - Site Sheets and Topo Maps             <ul style="list-style-type: none"> <li>Impacts and Design Suggestions:                 <ul style="list-style-type: none"> <li>○ Automate the <b>Site Sheets</b> to automatically validate and review for accuracy by creating validation checks for the submitter.                     <ul style="list-style-type: none"> <li>➢ Allow the submitter to enter all of their information in a web form (one form for solar resources and one for wind resources).</li> <li>➢ Incorporate validation check on information submitted to ensure all fields are entered correctly and match Appendix Q formatting (e.g., WGS84 coordinates, resource type filled out, address provided is a legitimate address).</li> <li>➢ Add a web form check option to determine if primary met station equipment is LiDAR or not.</li> <li>➢ Information entered into the system can be compiled into a site sheet (XLSX or PDF format), but the information can also be stored in a database for retrieval and query.</li> </ul> </li> <li>○ Automate <b>Topo Maps</b> validation checks.                     <ul style="list-style-type: none"> <li>➢ Require submitter to enter a list of coordinates for necessary elements on the topo map (project corners, met station location, and/or turbine locations) via a web form. The web form could then cross reference coordinates with the site sheet to confirm all information has been entered accurately and correctly.</li> <li>➢ Require submitter to upload a digital copy (PDF) of their topo map.</li> <li>➢ Require submitter to upload a picture of the physical site.</li> </ul> </li> </ul> </li> </ul> </li> </ul>

# Fall 2021 – Western EIM Sub-Entity Scheduling Coordinator Role

Project Information	Details/Date
<p><b>High Level Project Scope</b></p>	<ul style="list-style-type: none"> <li>• CAISO will send load settlements to each of its utility members instead of by EIM entity. New roles need to be created for non-participating load SC.</li> <li>• New role for EIM-only BAA.</li> </ul> <ul style="list-style-type: none"> <li>➤ <b>Network Model</b> <ul style="list-style-type: none"> <li>❑ FNM expansion to include for PSCO EIM participating and non-participating resources.</li> <li>❑ Included into market network model.</li> </ul> </li> <li>➤ <b>Delineation of LSEs</b> <ul style="list-style-type: none"> <li>❑ Consumption of market input data that are provided by each utility member.</li> <li>❑ Provision of detailed market results to EIM entity.</li> </ul> </li> <li>➤ <b>Load Forecast</b> <ul style="list-style-type: none"> <li>❑ Creation of multiple LAPs for EIM entity.</li> <li>❑ Consumption of Demand Forecast that are provided by each utility member for each LAP area that is not using CAISO demand forecast.</li> <li>❑ Expansion of CAISO Demand Forecast to include utility member LAPs that are using CAISO demand forecast.</li> </ul> </li> <li>➤ <b>Scheduling</b> <ul style="list-style-type: none"> <li>❑ Each utility member will be represented by its own participating resources' SC.</li> <li>❑ Consumption of Base Schedule from each participating resources' SC into BSAP.</li> <li>❑ Consumption of Base Schedule from non-participating resources via EIM Entity SC into BSAP.</li> <li>❑ Consumption of bids from each participating resource SC into SIBR.</li> </ul> </li> <li>➤ <b>Balancing and Resource Sufficiency Tests</b> <ul style="list-style-type: none"> <li>❑ Performing aggregated demand forecast.</li> <li>❑ Balancing at EIM Entity BAA level.</li> <li>❑ Conducting Resource Sufficiency Test at EIM Entity BAA level.</li> </ul> </li> <li>➤ <b>Metering</b> <ul style="list-style-type: none"> <li>❑ Consumption of meter data from participating resource SCs as well as SCs for non-participating loads.</li> </ul> </li> <li>➤ <b>System Interface</b> <ul style="list-style-type: none"> <li>❑ EIM Entity SC is responsible for all system interfaces.</li> </ul> </li> <li>➤ <b>Settlements</b> <ul style="list-style-type: none"> <li>❑ Generation of Settlements statements and invoices to participating resources SCs.</li> <li>❑ Provision of other settlements data that are attributable by sub-area (offsets, UFE, BCR) and assign them to EIM entity for sub-allocation to individual sub-BAAs based on Open Access Transmission Tariff (OATT). The latter will be performed by the PSCO EIM Entity.</li> <li>❑ Generation of statements and invoices (e.g. uplift charges) to EIM Entity SCs and non-participating load SCs.</li> <li>❑ Access to Load settlement statements/invoices information shall be granted to parent EIM Entity SC.</li> </ul> </li> </ul>

# Fall 2021 – Western EIM Sub-Entity Scheduling Coordinator Role

Project Information	Details/Date
<b>BPM Changes</b>	Energy Imbalance Market (EIM), Market Instruments, Outage Management
<b>Tariff Change</b>	No
<b>Impacted Systems</b>	ALFS, CMRI, Master File, RC-BSAP, RIMS, WebOMS

# Fall 2021 – Western EIM Sub-Entity Scheduling Coordinator Role (cont'd)

System	High Level Changes
<b>Automated Load Forecast System (ALFS)</b>	<ul style="list-style-type: none"> <li>• Provide forecast for 4 load forecast zones:</li> <li>• Sum the total load.</li> <li>• Consumption of Demand Forecast that are provided by each utility member for each LAP area that is not using CAISO demand forecast.</li> <li>• Expansion of CAISO Demand Forecast to include utility member LAPs that are using CAISO demand forecast.</li> <li>• Stop consumption of hourly load forecasts for each load forecast area for D+1 and further out from SPP RC.</li> <li>• Consumption of hourly load forecasts for each load forecast area for D+1, D+2, D+3, D+4 from EIM entity.</li> <li>• Stop consumption of hourly load forecasts for each load forecast area for real-time from SPP RC.</li> <li>• Consumption of hourly load forecasts for each load forecast area for real-time from EIM entity.</li> <li>• Publish the submitted DA forecast in DayAheadLoadforecast for DACA. (existing functionality).</li> <li>• data available for the ALFS forecast engine:                             <ul style="list-style-type: none"> <li>• Historical meter data.</li> <li>• Weather zone and weather station data.</li> <li>• EIM provides historic load for each of the 4 load forecast areas.</li> </ul> </li> <li>• CAISO ALFS will train the forecast each of the 4 load forecast areas.</li> <li>• Model market implementation of as its own EIM BAA, ELAP, and include CLAPs for LSEs.</li> <li>• Include load in EIM system load.</li> <li>• Publish CAISO total and 4 individual load forecasts to downstream systems. (existing functionality)</li> <li>• Evaluate performance and data storage.</li> </ul>
<b>CAISO Market Results Interface (CMRI)</b>	<p><b>Potential System Impact:</b></p> <ul style="list-style-type: none"> <li>• EIM to Load Base Schedule report (accessed by EIM Entity SC, and Non- Participating Resource SC):                             <ul style="list-style-type: none"> <li>• Will show multiple registered loads for EIM BAA, showing multiple loads per BAA.</li> <li>• Applies to non-participating load SCs for their specific load resources.</li> </ul> </li> </ul>
<b>Master File (MF)</b>	<ul style="list-style-type: none"> <li>• <b>System Impact:</b> <ul style="list-style-type: none"> <li>• Define 4 non-participating load SCs to represent each utility member.</li> <li>• Define mapping between EIM Entity SC and the non-participating load SCs.</li> </ul> </li> </ul>
<b>Reliability Coordinator Base Schedule Aggregation Portal (RC-BSAP)</b>	<ul style="list-style-type: none"> <li>• <b>System Impact:</b></li> <li>• Stop consumption of base schedules for D+1 and further from SPP RC.</li> <li>• Stop consumption of base schedules for real-time and further from SPP RC.</li> </ul>

# Fall 2021 – Western EIM Sub-Entity Scheduling Coordinator Role (cont'd)

System	High Level Changes
<b>Resource Interconnection Management System (RIMS)</b>	<ul style="list-style-type: none"> <li>• Impact regarding network model data submission.</li> <li>• EIM Entity submit model for all its members.</li> <li>• Current RIMS access is only available to PTO and RC participants.</li> <li>• and related entities (EIM only category) do not fit either of those categories. Accommodations shall be provided.</li> <li>• Share network model with SPP RC.</li> <li>• Same impact applies to TEP too.</li> </ul>
<b>Web Outage Management System (WebOMS)</b>	<p><b>Potential System Impact:</b></p> <ul style="list-style-type: none"> <li>• Stop consumption of EIM Entity SC resource outages from SPP RC.</li> <li>• EIM Entity (non-RC West entity) submits resource outages, broken down by ACL</li> <li>• Stop consumption of TOP transmission outages from SPP RC.</li> <li>• Each TOP (non-RC West entity) submits their transmission outages.</li> </ul>

# Fall 2021 – EIM Enhancements 2021 Phase 2

Project Information	Details/Date
<b>High Level Business Problem or Need</b>	To collectively address important issues identified by EIM market participants through Customer Inquiry, Dispute and Information system (CIDI) requests to improve the visibility, functions and features in Energy Imbalance Market (EIM).
<b>High Level Project Scope</b>	<ul style="list-style-type: none"> <li>• Fix/Improve SVG One Lines operator display</li> <li>• Allow EIM resources to cycle its unit commitment when base schedules are submitted with three-part economic bids (with specific exceptions detailed)</li> <li>• BAAOP: Specify parameters for Shared ramping capability constraint.</li> <li>• CMRI: report T-7.5 initial schedule for Resource sufficiency test</li> <li>• BAAOP: Separate ETSR Base from ETSR detail display</li> </ul>
<b>BPM Changes</b>	EIM, Market Instruments
<b>Tariff Change</b>	Section 29.4
<b>Impacted Systems</b>	RTM/BAAOP, RTM/Integration, CMRI, RTM/BAAOP

# Fall 2021 – EIM Enhancements 2021 Phase 2 (cont'd)

System	High Level Changes
<b>Master File (MF)</b>  <b>CIDI:</b> <b>226744</b> <b>226745</b>	<ul style="list-style-type: none"> <li>• Define ITC, ETSR association with EIM entities SC</li> <li>• For the EIM entities that share the same path, if ETSR primary EIM entity SC authorize,               <ul style="list-style-type: none"> <li>○ Associate the other EIM entity SC with ETSR resources. TBD: ETSR and mirror, static intertie resources</li> </ul> </li> <li>• For the EIM entities that share the same path, if ITC owner primary EIM entity SC authorize               <ul style="list-style-type: none"> <li>○ Associate the other EIM entity SC with ITC</li> </ul> </li> <li>• TBD: define total ITC for the all ITCs associate of the path of EIM entities for total, instead of market sum up               <ul style="list-style-type: none"> <li>○ Associate every ETSRs that use this path with total ITC</li> <li>○ Associate Path operator EIM entity and other EIM entities with total ITC</li> </ul> </li> </ul>
<b>Real-Time Market (RTM) /Balancing Authority Area Operations Portal (BAAOP)</b>  <b>CIDI:</b> <b>226744</b> <b>226693</b>	<ul style="list-style-type: none"> <li>• Receive association ETSR/ITC with EIM entities</li> <li>• Allow the associated EIM entities to view the ITC and associated ETSR</li> <li>• Add New UI (TBD)ITC detail display in BAAOP, a table of all internal BAA ITCs and shared/global ITC's which should include the ITC name, import limit, export limit, net flow (cleared value).</li> <li>• Each ITC should have a sub-table displaying each resource included in the ITC with a calculation row with the sum of each data column for the market horizon for RTPD and RTD</li> <li>• TBD: monitor ATC Total ITC and associated ETSR</li> <li>• Ensure No impact on existing function</li> <li>• Remove ETSR BASE from ETSR details table</li> <li>• Build a new UI for ETSR base</li> </ul>
<b>Real-Time Market (RTM) /Balancing Authority Area Operations Portal (BAAOP)</b> <b>CIDI: 215444</b>	<ul style="list-style-type: none"> <li>• Within system data persistent during market run in all market display: displays Continue to show data on display until replaced with new data</li> </ul>

# Fall 2021 – EIM Enhancements 2021 Phase 2 (cont'd)

System	High Level Changes
<b>Real-Time Market (RTM) /Real-Time Base Schedule (RTBS)</b>	<ul style="list-style-type: none"> <li>• Offline units with Base schedule</li> <li>• centralized activation/de-activation means of this functionality</li> <li>• System shall consider offline resources that are cycling as available for the balancing, bid range capacity, and flexible ramp sufficiency tests if capable for startup within the next hour. Same for shutdown</li> </ul>
<b>Real-Time Market (RTM)</b>	<ul style="list-style-type: none"> <li>• Shared ramping capability constraint</li> <li>• UI for EIM entity input parameters for ramp sharing</li> <li>• Use in the optimization for each resource based on BAA ramp share parameters</li> </ul>
<b>CAISO Market Results Interface (CMRI)</b>  <b>CIDI: 226745</b>	<ul style="list-style-type: none"> <li>• Create ITC limit report</li> <li>• Receive association ITC with EIM entities</li> <li>• Allow the associated EIM entities to view the ITC limits report through ACL</li> <li>• Receive the ITC/TCOR/PTST limits from market</li> <li>• Create ITC limit report UI/API</li> <li>• Create TCOR limit report UI/API</li> <li>• TBD: Create PTST limit report UI/API</li> </ul>
<b>CAISO Market Results Interface (CMRI)</b>  <b>For CIDI:</b> <b>225772</b> <b>226693</b>	<p>Create reports on for each BS test at T-75, T-55, T-40, T-30</p> <ul style="list-style-type: none"> <li>• Resource T-7.5 initial schedule for BS resource sufficiency (RS) test UI/API</li> <li>• Load forecast T-7.5 for RS test UI/API</li> </ul>
<b>Real-Time Market (RTM)/Real-Time Unit Commitment (RTUC) [(HASP, STUC, FMM)]</b>	<ul style="list-style-type: none"> <li>• Cycling resource with base schedule in Market</li> <li>• centralized activation/de-activation means of this functionality             <ul style="list-style-type: none"> <li>○ Real-Time Markets shall have the capability to automatically start-up an offline resource that is cycling if it is economic to run.</li> <li>○ Similarly, Real-Time Markets shall have the capability to automatically shut down an online resource that is cycling if is not economic to run.</li> <li>○ Consider EIM resources with positive base schedules above minimum load and with three-part bids as cycling during the relevant trade hour (i.e. optimize its unit commitment on the basis of its bids), with the following exceptions:</li> <li>○ Self-schedule exists</li> <li>○ Ancillary service base schedule exists (except when non-spin for an offline resource capable of startup within 10-minutes)</li> <li>○ Flexible ramp award exists (except when flex ramp up award for an offline resource capable of startup within 5-minutes)</li> <li>○ Inter-temporal constraint (startup time, minimum up time, minimum down time, maximum daily starts) prevents cycling</li> </ul> </li> <li>• Real-time market horizon has limitation, where resource startup time plus minimum up time exceeds 240 minutes</li> <li>• Cycling shall include both startup and shutdown unit commitment decisions on basis of three-part bids (economic energy bid, startup, minimum load) and applicable temporal constraints.</li> <li>• A positive base schedule from a resource without an energy bid shall still be treated as a self-schedule.</li> </ul>

# Fall 2021 – EIM Base Schedule Submission Deadline Phase 2

Project Information	Details/Date
<b>High Level Business Problem or Need</b>	Provide EIM Scheduling Coordinators with additional flexibility to submit more accurate base schedules closer to the operating hour. Allow CAISO and EIM Entities to more accurately capture the startup energy of large conventional resources within their Resource Sufficiency Evaluations (RSE), thus increasing their ability to pass the RSE while lowering their exposure to uninstructed imbalance energy settlement.
<b>High Level Project Scope</b>	Updates to the base schedule submission timeline <ul style="list-style-type: none"> <li>• Move market closing for the final binding EIM base schedule submissions from T-40 to T-30, and add additional RSE at T-40</li> <li>• Note: Base Schedule Validation outlined in the Policy paper will be covered in existing Market Validation processes so no additional manual or automated business process requirements are needed for Tariff compliance.</li> </ul>
<b>BPM Changes</b>	EIM, MI, MO, Settlements
<b>Tariff Change</b>	No
<b>Impacted Systems</b>	RTM, Settlements, BSAP, RCBSAP, ITS, ADS, CMRI/OASIS

# Fall 2021 – EIM Base Schedule Submission Deadline Phase 2 (cont'd)

System	High Level Changes
<b>Real-Time Market (RTM)</b>	<b>Phase 2:</b> <ul style="list-style-type: none"> <li>• Shorten the run time of the current T-37.5 RTPD interval</li> <li>• Move start time to after T-30</li> <li>• Result publication remains at T-22.5</li> <li>• Final RSE will begin following T-30 deadline</li> <li>• Add additional RSE test</li> </ul>
<b>Base Schedule Aggregation Portal (BSAP)</b>	<b>Phase 2:</b> <ul style="list-style-type: none"> <li>• Send base schedule to market at T-30</li> </ul>
<b>Interchange Transaction Scheduler (ITS)</b>	<b>Phase 2:</b> <ul style="list-style-type: none"> <li>• ITS will need to adjust the timing of RTPD publication checks and adjustments to account for the RTPD change from T-37.5 RTPD to T-30</li> <li>• RTPD 5 run will be decreased to around five and a half minutes</li> <li>• RTPD 5 run will be considered late at T-22.5</li> <li>• RTPD 4 should start at T-21.5</li> <li>• Payload times need to be adjusted</li> </ul>
<b>CAISO Market Results Interface (CMRI)</b>	<b>Phase 2:</b> <ul style="list-style-type: none"> <li>• Additional payload consumed at T-30 for test results</li> <li>• Receive results from RTPD 5 run by T-22.5</li> </ul>

# Fall 2021 – Real Time Settlements Review Phase 2

Project Information	Details/Date
<b>High Level Project Scope</b>	Clarify Tariff language that involves a market rule change that will allow an EIM entity not to settle Unaccounted for Energy (UFE) for each EIM entity.
<b>BPM Changes</b>	Settlements & Billing
<b>Tariff Change</b>	29.11 (q), (r), (c) (2), 11.8.6.3
<b>Impacted Systems</b>	Settlements, Master File, RTBS

System	High Level Changes
<b>Settlements</b>	<ul style="list-style-type: none"> <li>Configuration settlement changes for UFE charge codes</li> </ul>
<b>Master File (MF)</b>	<ul style="list-style-type: none"> <li>Need to establish a base transfer system resources at a transfer location between EIM BAAs and the default the Settlement Flag = Y</li> </ul>
<b>Real Time Base Schedule (RTBS)</b>	<ul style="list-style-type: none"> <li>System shall receive the transmission loss percentage from Master File.</li> </ul> <p><b>Note:</b> This requirement moves the maintenance of this data set to Master File.</p>

# Fall 2021 – Variable Operations & Maintenance Cost Review

Project Information	Details/Date
High Level Business Problem or Need	This project proposes to change the structure of how operations and maintenance (O&M) costs are estimated for use in the CAISO markets. This project is composed of three scope items
High Level Project Scope	<p><b>Scope 1:</b> Defining the O&amp;M cost components, including how to differentiate between fixed and variable O&amp;M costs</p> <p><b>Scope 2:</b> Redefining the VOM adder as only a variable operations (VO) adder</p> <p><b>Scope 3:</b> Allow market participants to bid in <i>all</i> of their variable maintenance costs through a new default maintenance adder in lieu of the current MMA.</p>
BPM Changes	Market Instruments
Tariff Change	39.7.1.1.2
Impacted Systems	SIBR, Master File, Settlements

# Fall 2021 – Variable Operations & Maintenance Cost Review (cont'd)

System	High Level Changes
<b>Settlements</b>	<p><u>Scope 1:</u> Potential charge code impacts due to RMR contracts. Policy is in the process of accessing these impacts and will have an update by the time of the Draft Final Proposal publication.</p>
<b>Scheduling Infrastructure Business Rules (SIBR)</b>	<p><u>Scope 3:</u> SIBR will receive the Maintenance Adder (MA) from Master File. System must be enhanced to perform an automated calculation for a resource specific maintenance adder (<math>RSMA = \text{Default MA} * \text{Resource's Pmax}</math>), if the resource has elected for the default MA. If the resource has elected for a negotiated MA, the value can be used directly without the need to multiply with the Pmax. Potential performance impact due to the number of resources applying for default maintenance adder (10x as many hydro resources as today and 2x as many gas resources as today). SIBR rules will need to be updated to reflect the latest terminology: Major Maintenance Adder to new term "Default Maintenance Adder".</p>
<b>Master File</b>	<p><u>Scope 2:</u> Default Variable Operations (VO) Adder and Maintenance Adder (MA) will be stored against the technology type. Two new data sets must be stored:</p> <ul style="list-style-type: none"> <li>-Default VO Adder to Technology Type Mapping – new</li> <li>- Default MA to Technology type mapping – new</li> </ul> <p>Two new flags will need to be added at the resource/configuration level:</p> <ul style="list-style-type: none"> <li>o Default or Negotiated VO Adder (naming change: VO adder replaces the O&amp;M adder)</li> <li>o Default or Negotiated Maintenance adder (new)</li> </ul> <p>Two new columns to store the VO adder and MA adder at the resource/configuration level. Depending on whether the resource/configuration has selected default or negotiated, one of these values will be displaced in these new columns for both adders.</p> <p>The two new flags and the two new adder values must be visible within the Resource Data Template (RDT).</p> <p>The current database table that is based on technology type needs to be updated with the latest values outlined within the Revised Straw Proposal policy paper. Additional technology types may need to be added.</p> <p><u>Scope 3:</u> Only the final calculated default Maintenance Adder (MA) will be stored against the technology type (can either be in \$/run-hour or \$/start-up).</p>

# 2022 Spring Release

# Spring 2022 – EIM integrations for Avista, BPA, Tacoma Power, Xcel Energy - Colorado, Tucson Electric Power

Project Info	Details/Date
Application Software Changes	Implementation of Avista, BPA, Tacoma Power, Xcel Energy - Colorado, and Tucson Electric Power as EIM Entities
BPM Changes	EIM BPM will be updated if needed to reflect new modeling scenarios identified during implementation and feedback from BANC Phase 2, TID, PNM, LADWP, and NWE.
Market Simulation	October 1, 2021 - February 3, 2022
Parallel Operations	February 2022 thru March 2022

Milestone Type	Milestone Name	Dates					Status
		Avista	BPA	Tacoma Power	Xcel Energy - Colorado	Tucson Electric Power	
Market Sim	Market Sim Window	10/1/21 - 11/30/21	10/1/21 - 11/30/21	10/4/21 - 12/3/21	12/1/21 - 1/26/21	12/1/20 - 1/31/21	
Parallel Operations	Parallel Operations	Feb 2020 thru Mar 2022					
Tariff	File Readiness Certification	Mar 2022					
Production	Activation	3/2/22	3/2/22	3/2/22	4/1/22	4/1/22	

# Stay Informed

# Ways to participate in releases

- Visit the Release Planning page
  - <http://www.caiso.com/informed/Pages/ReleasePlanning/Default.aspx>
- 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 [www.caiso.com](http://www.caiso.com) 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...

## Calendar of Meetings, Training and Events

Month: February Year: 2018 Calendar View List View Print View

February 2018						
Sun	Mon	Tue	Wed	Thu	Fri	Sat
	<p><b>Market Sim</b></p> <p>WebCONF: Market Simulation 2:00pm - 3:00pm</p>	<p>Training: Get to Know the ISO - Day 1 9:00am - 4:00pm</p> <p>WebCONF: Imbalance Conformance Enhancements 10:00am - 12:00pm</p> <p>WebCONF: Technical User Group 10:00am - 11:00am</p>	<p>Deadline: Comments - Interconnection Process Enhancements 2018 - Issue Paper and Meeting Discussion 9:00am - 4:00pm</p> <p>Training: Get to Know the ISO - Day 2 9:00am - 4:00pm</p> <p>Meeting: Flexible Resource Adequacy Criteria Must Offer Obligation Phase 2 - Revised Draft Flexible Capacity Framework 10:00am - 4:00pm</p> <p>WebCONF: Market Settlement User Group 10:00am - 11:00am</p>	<p>Meeting: Audit Committee Teleconference (Executive) 3:30pm - 6:30pm</p> <p>Training: Settlements 101 9:00am - 4:00pm</p> <p>Meeting: 2017-2018 Transmission Planning Process 10:00am - 4:00pm</p> <p><b>Market Sim</b></p> <p>WebCONF: Market Simulation 2:00pm - 3:00pm</p>	<p>Training: Settlements 201 9:00am - 4:00pm</p>	
<p>WebCONF: Participating Transmission Owner Per Unit Cost Guides 10:30am - 12:00pm</p> <p>WebCONF: Market Simulation 2:00pm - 3:00pm</p> <p><b>Release Users Group (RUG)</b></p>	<p>Meeting: Congestion Revenue Rights Auction Efficiency 10:00am - 4:00pm</p> <p>WebCONF: Release User Group 10:00am - 11:00am</p> <p>Call: Energy Imbalance Market Governing Body Teleconference (Executive) 11:30am - 12:30pm</p>	<p>Deadline: Submissions - April 2018 Monthly Resource Adequacy and Supply Plans 11:00am - 11:30am</p> <p>Call: Congestion Revenue Rights 11:00am - 11:30am</p> <p>WebCONF: Outage Management System Customer Partnership Group 2:00pm - 3:00pm</p>	<p>Deadline: Comments - Review Transmission Access Charge Structure Straw Proposal and Meeting Discussion 3:15pm - 6:00pm</p> <p>Call: Board of Governors Teleconference (General) 9:00am - 10:00am</p> <p>Call: Board of Governors Teleconference (Executive) 9:00am - 10:00am</p> <p>Call: Market Update 10:15am - 11:00am</p> <p>WebCONF: Market Simulation</p>			