



# Release User Group Agenda

April 9<sup>th</sup>, 2019

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><br/>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>Dial-in Number: 866-528-2256<br/>International Dial-in: 216-706-7052<br/>Access Code: 291 426 5</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

April 9<sup>th</sup>, 2019

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 Deluca<br>Cynthia Hinman<br>Christopher McIntosh<br>Jeremy Malekos<br>Janet Morris |

# The ISO offers innovative training programs

| Date         | Training courses and workshops            |
|--------------|---|
| April 11     | Welcome to the ISO webinar                |
| Mid-April    | EIM Resource Sufficiency Enhancements CBT |
| April 23 -25 | ISO Training Workshop (ISO Headquarters)  |



CustomerTraining@caiso.com

## New Modules (recorded webinar and slides)

You can find new initiatives training courses on the learning center web page below.  
More resources will be added throughout 2019 in accordance with project schedules.

## 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 Imbalance Energy Market

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: 2019

## Spring 2019

- Commitment Cost Enhancement (CCE) Phase 3
- Energy Imbalance Market (EIM) 2019 Balancing Authority of Northern California (BANC) / Sacramento Municipal Utility District (SMUD)

## Independent 2019

- EIM Resource Sufficiency Enhancements
- LMC Transparency Enhancement

## Fall 2019

- Commitment Costs and Default Energy Bid Enhancements Phase 1
- Energy Storage and Distributed Energy Resources Phase 3A
- RMR and CPM Enhancements (March 2019 BOG)
- Local Market Power Mitigation Enhancements (Mar 2019 BOG)
- EIM 2019 Enhancements

# Release Plan Summary: 2020 - 2021

## Spring 2020

- Energy Imbalance Market (EIM) 2020 Salt River Project
- Energy Imbalance Market (EIM) 2020 Seattle City Light
- Energy Imbalance Market (EIM) 2020 Los Angeles Dept. of Water and Power

## Independent 2020

- Automated Dispatch System (ADS) User Interface (UI) Replacement

## Fall 2020

- DAME 15 Minute Granularity – Phase 1 (Jul 2019 BOG)
- Commitment Costs and Default Energy Bid Enhancements Phase 2
- Contingency Modeling Enhancements - Transmission
- Energy Storage and Distributed Energy Resources Phase 3B
- Dispatch Operating Target Tariff Clarifications
- Intertie Deviation Settlement
- Excess Behind the Meter Production (May 2019 BOG)

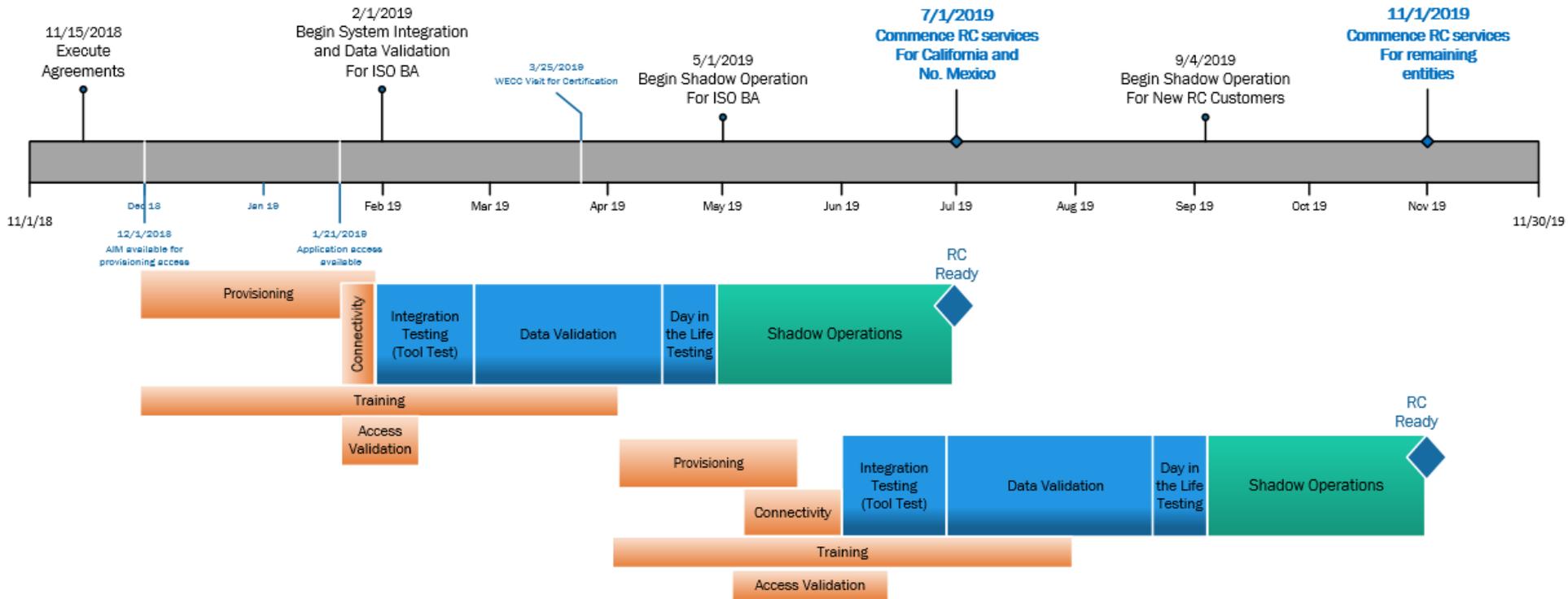
## Spring 2021

- Energy Imbalance Market (EIM) 2021 Public Service Company of New Mexico
- Energy Imbalance Market (EIM) 2021 North-Western Energy

## TBD – tentative, subject to impact assessment

- DAME - Flexible Ramping Product (Jul 2019 BOG)
- RA Enhancements Track 2 (Nov 2019 BOG)
- Energy Storage and Distributed Energy Resources Phase 4
- Storage as a Transmission Facility (BOG TBD)
- TAC Structure Enhancements (May 2019 BOG)

# RC Participant Onboarding Timeline – please attend RC Onboarding webinars for more information.



# System Interface Changes: CMRI

| Release     | Project | Change Type | Customer Impact | Customer Action  | UI Change  | API Service Name & Major Version   | MAP Stage   | Production Activation   | Technical Specifications | Artifacts             |
|-------------|---------|-------------|-----------------|------------------|--|--|-------------|---|--------------------------|-----------------------|
| Spring 2019 | CCE3    | New         | CAISO Market    | Adopt when ready | Tab: Default Bids<br><br>New Report: Actual Limitation Values      | RetrieveActualLimitationValues_CMRIv1<br><br>RetrieveActualLimitationValues_CMRIv1_DocAttach   | Sep 2018    | April 1, 2019*<br><br>*Data available April 18 for May 2018 thru April 2019 | <a href="#">3.8.2</a>    | <a href="#">1.1</a>   |
| Spring 2019 | CCE3    | New         | CAISO Market    | Adopt when ready | Tab: Default Bids<br><br>New Report: Resource Opportunity Costs    | RetrieveResourceOpportunityCost_CMRIv1<br><br>RetrieveResourceOpportunityCost_CMRIv1_DocAttach | Sep 2018    | April 1, 2019*<br><br>*Data available April 30 for May 2019                 | <a href="#">3.8.2</a>    | <a href="#">1.1</a>   |
| 2019        | RCSI    | New         | RC              | Adopt when ready | New Tab: Reliability Coordination<br><br>New Report: Load Forecast | RetrieveRCLoadForecast_CMRI_v1<br><br>RetrieveRCLoadForecast_CMRI_v1_DocAttach                 | Feb 1, 2019 | Jul 1, 2019   | <a href="#">1.0.0</a>    | <a href="#">1.1.0</a> |

# System Interface Changes: OMS

| Release | Project | Change Type  | API Service Name & Major Version   | MAP Stage    | Production Activation | Technical Specifications | Artifacts                 |
|---------|---------|--|--|--------------|-----------------------|--------------------------|---------------------------|
| 2019    | RCSI    | Modify*<br><br><i>*While the CAISO supports two major versions of API, the CAISO strongly recommends moving to the latest one (v3)</i> | RetrieveAvailabilityResults_OMSv2<br>RetrieveAvailabilityResults_OMSv2_DocAttach<br><br>RetrieveResourceOutage_OMSv3<br>RetrieveResourceOutage_OMSv3_DocAttach<br><br>RetrieveResourceOutageChangeRequest_OMSv3<br>RetrieveResourceOutageChangeRequest_OMSv3_DocAttach<br><br>RetrieveTransmissionOutage_OMSv3<br>RetrieveTransmissionOutage_OMSv3_DocAttach<br><br>RetrieveTransmissionOutageChangeRequest_OMSv3<br>RetrieveTransmissionOutageChangeRequest_OMSv3_DocAttach<br><br>SubmitResourceOutage_OMSv3<br>SubmitResourceOutage_OMSv3_DocAttach<br><br>SubmitResourceOutageChangeRequest_OMSv3<br>SubmitResourceOutageChangeRequest_OMSv3_DocAttach<br><br>SubmitTransmissionOutage_OMSv3<br>SubmitTransmissionOutage_OMSv3_DocAttach<br><br>SubmitTransmissionOutageChangeRequest_OMSv3<br>SubmitTransmissionOutageChangeRequest_OMSv3_DocAttach | Feb 28, 2019 | Jul 1, 2019           | <a href="#">2.0</a>      | <a href="#">Artifacts</a> |

# System Interface Changes: ALFS, RCBSAP, RCEIDE, STLMT

| System | Release | Project | Change Type | API Service Name & Major Version   | MAP Stage   | Production Activation | Technical Specifications | Artifacts                 |
|--------|---------|---------|-------------|--|-------------|-----------------------|--------------------------|---------------------------|
| ALFS   | 2019    | RCSI    | New         | SubmitExternalEntity5MinLoadForecast_ALFSv1<br>SubmitExternalEntity5MinLoadForecast_ALFSv1_DocAttach<br><br>SubmitExternalEntity15MinLoadForecast_ALFSv1<br>SubmitExternalEntity15MinLoadForecast_ALFSv1_DocAttach<br><br>SubmitExternalEntity60MinLoadForecast_ALFSv1<br>SubmitExternalEntity60MinLoadForecast_ALFSv1_DocAttach | Feb 1, 2019 | Jul 1, 2019           | <a href="#">1.0.0</a>    | <a href="#">Artifacts</a> |
| RCBSAP | 2019    | RCSI    | New         | RetrieveRCBaseScheduleResults_RCBSAPv1<br>RetrieveRCBaseScheduleResults_RCBSAPv1_DocAttach<br><br>SubmitRCBaseSchedule_RCBSAPv1<br>SubmitRCBaseSchedule_RCBSAPv1_DocAttach   | Feb 1, 2019 | Jul 1, 2019           | <a href="#">1.1</a>      | <a href="#">Artifacts</a> |
| RCEIDE | 2019    | RCSI    | New         | PutSchedule_RC   | Feb 1, 2019 | Jul 1, 2019           | <a href="#">1.0</a>      | <a href="#">Artifacts</a> |
| STLMT  | 2019    | RCSI    | New         | SubmitNetEnergyData_STLMTv1<br>SubmitNetEnergyData_STLMTv1_DocAttach<br><br>*For RC Customers outside of the CAISO BA to submit Net Energy for Load and Net Generation   | TBD         | TBD                   | <a href="#">1.0</a>      | <a href="#">1.0</a>       |

## References

- This document
  - <http://www.caiso.com/Documents/SystemInterfaceChangeSummary.pdf>
- Developer Site
  - <https://developer.caiso.com/>
  - Requires sign-up for access
  - Fall 2019 Release Technical Specifications will be published here
- Application Access
  - <http://www.caiso.com/participate/Pages/ApplicationAccess/Default.aspx>

# Release Schedule 2019

Date of Data Refresh: 4/2/19 9:11 AM



| Legend            |                 |
|-------------------|-----------------|
| Market Simulation | CA ISO Holiday  |
| External Testing  | Deployment Week |

|                   |
|-------------------|
| 4/1/19 - 4/7/19   |
| 4/8/19 - 4/14/19  |
| 4/15/19 - 4/21/19 |
| 4/22/19 - 4/28/19 |
| 4/29/19 - 5/5/19  |
| 5/6/19 - 5/12/19  |
| 5/27/19 - 6/2/19  |
| 7/1/19 - 7/7/19   |
| 7/8/19 - 7/14/19  |
| 7/15/19 - 7/21/19 |
| 7/22/19 - 7/28/19 |
| 7/29/19 - 8/4/19  |
| 8/5/19 - 8/11/19  |
| 8/12/19 - 8/18/19 |
| 8/19/19 - 8/25/19 |
| 9/2/19 - 9/8/19   |
| 9/30/19 - 10/6/19 |

## MAP Stage Environment Window

|   |   |
|---|---|
| EIM Resource Sufficiency - Capacity & Sufficiency                           | EIM Resource Sufficiency - Capacity & Sufficiency (04/01-05/06)                     |
| EIM Resource Sufficiency - Capacity & Sufficiency - External Testing Starts | EIM Resource Sufficiency - Capacity & Sufficiency - External Testing Starts (04/01) |
| CCDEBE Phase 1  | CCDEBE Phase 1 (07/15-08/30)  |
| CCDEBE Phase 1 - Market Sim   | CCDEBE Phase 1 - Market Sim (07/15-08/30)   |
| ESDER Phase 3A  | ESDER Phase 3A - Bid Dispatchable Option (07/15-08/30)                              |
| ESDER Phase 3A - Market Sim   | ESDER Phase 3A - Bid Dispatchable Option - Market Sim (07/15-08/30)                 |
| RMR and CPM Enhancements  | RMR and CPM Enhancements (07/15-08/30)  |
| RMR and CPM Enhancements - Market Sim                                       | RMR and CPM Enhancements - Market Sim (07/15-08/30)                                 |
| LMPM - Enhancements   | LMPM - Enhancements (07/15-08/30)   |
| LMPM - Enhancements - Market Sim  | LMPM - Enhancements - Market Sim (07/15-08/30)                                      |
| EIM Enhancements 2019   | EIM Enhancements 2019 (07/15-08/30)   |
| EIM Enhancements 2019 - Market Sim  | EIM Enhancements 2019 - Market Sim (07/15-08/30)                                    |

## Production Environment Window

|   |   |
|---|---|
| Commitment Cost Enhancements Phase 3 Activation | Commitment Cost Enhancements Phase 3 Activation (04/01) |
| EIM - BANC-SMUD                                 | EIM - BANC-SMUD (04/03)                                 |
| LMC Transparency Enhancements                   | LMC Transparency Enhancements (05/01)                   |
| EIM Resource Sufficiency Capacity & Sufficiency | EIM Resource Sufficiency Capacity & Sufficiency (05/06) |
| CCDEBE Phase 1                                  | CCDEBE Phase 1 (10/01)                                  |
| ESDER Phase 3A                                  | ESDER Phase 3A (10/01)                                  |
| RMR and CPM Enhancements                        | RMR and CPM Enhancements (10/01)                        |
| LMPM - Enhancements                             | LMPM - Enhancements (10/01)                             |
| EIM Enhancements 2019                           | EIM Enhancements 2019 (10/01)                           |

<http://www.caiso.com/Documents/ReleaseSchedule.pdf>

# 2019 Spring Release

# Spring 2019 Release – Overview

|                                       | Board Approval | External BRS | Config Guide | Tech Spec | Draft Tariff** | BPMs     | External Training | Market Sim / Ext Testing Start | Production Activation |
|---------------------------------------|----------------|--------------|--------------|-----------|----------------|----------|-------------------|--------------------------------|-----------------------|
| <b>Spring 2019 Release - Overview</b> |                |              |              |           |                |          |                   |                                |                       |
| Commitment Costs Phase 3              | 03/25/16       | 08/21/17     | 05/17/18     | 08/02/18  | 07/31/17       | 12/07/18 | 09/10/18          | 09/05/18 – 10/12/18            | 04/01/19              |
| EIM - BANC-SMUD                       | N/A            | N/A          | N/A          | N/A       | N/A            | N/A      | N/A               | 12/03/18 – 01/31/19            | 04/03/19              |

## Notes:

Items in **BLUE** are complete

Items in **PURPLE** indicate a new date.

\*TBD items may be inapplicable, or they may have undetermined dates

\*\*Draft Tariff dates have been updated to show only the draft tariff posting. FERC Filing dates can be seen on individual project slides.

# Spring 2019 - Commitment Cost Enhancements Phase 3

| Project Info                 | Details/Date  |
|------------------------------|---|
| Application Software Changes | <p><b>Scope:</b></p> <ol style="list-style-type: none"> <li>1. Clarify use-limited registration process and documentation to determine opportunity costs</li> <li>2. Clarify definition of “use-limited”; add MSG Configuration ID to ULPDT</li> <li>3. Change Nature of Work attributes (Outage cards)               <ul style="list-style-type: none"> <li>• Modify use-limited reached for RAAIM Treatment</li> <li>• Allow PDR to submit use-limit outage card for fatigue break.</li> </ul> </li> <li>4. Market Characteristics (added to GRDT in Spring 2018) shall be Read-Only and set to Null               <ul style="list-style-type: none"> <li>• Maximum Daily Starts</li> <li>• Maximum MSG transitions</li> <li>• Ramp rates</li> </ul> </li> </ol> <p><b>Impacted Systems:</b></p> <ol style="list-style-type: none"> <li>1. Master File: Set use-limited resource types and limits</li> <li>2. CIRA: RAAIM exempt rule for “use-limited reached”</li> <li>3. CMRI: Publish opportunity cost</li> <li>4. SIBR: Add Opportunity cost adders on bid caps</li> <li>5. OMS: “Use-Limited Reached” nature of work attribute for Generation Outage Card</li> <li>6. Settlements: Publish the actual start up, run hour and energy output for the use-limited resources</li> </ol> |
| BPM Changes                  | Market Instruments, Outage Management, Reliability Requirement, Market Operations   |

## Spring 2019 - Commitment Cost Enhancements Phase 3 (cont.)

| Milestone Type        | Milestone Name  | Dates                       | Status |
|-----------------------|---|-----------------------------|--------|
| Board Approval        | Board of Governors (BOG) Approval   | Mar 25, 2016                | ✓      |
| External BRS          | Post Updated External BRS   | Aug 21, 2017                | ✓      |
| Config Guides         | Config Guide  | May 17, 2018                | ✓      |
| Tech Spec             | Publish Updated Master File Technical Specification, GRDT/IRDT Definitions        | Jul 13, 2018                | ✓      |
|                       | Publish updated CMRI Tech Spec, updated API for Use Limit Type Enumeration update | Aug 02, 2018                | ✓      |
| Tariff                | Draft Tariff  | Jul 31, 2017                | ✓      |
|                       | File Tariff   | Mar 23, 2018                | ✓      |
| BPMs                  | Publish Draft BPM: Market Instruments   | Oct 19, 2018                | ✓      |
|                       | Publish Draft BPM: Market Operations  | Oct 19, 2018                | ✓      |
|                       | Publish updated Draft BPMs  | Dec 07, 2018                | ✓      |
|                       | Publish updated Draft BPM: Market Operations (PRR 1147)                           | Mar 04, 2019                | ✓      |
| External Training     | Deliver External Training   | Sep 10, 2018                | ✓      |
| Market Simulation     | Full Market Simulation Testing  | Sep 05, 2018 - Oct 12, 2018 | ✓      |
| Production Activation | ISO reach out to resources eligible for negotiated opportunity costs              | Feb 2019                    | ✓      |
|                       | Commitment Costs Phase 3  | Apr 01, 2019                | ✓      |
|                       | OC Adders Effective   | May 01, 2019                |        |

# Spring 2019 – EIM BANC/SMUD

| Project Info                 | Details/Date   |
|------------------------------|--|
| Application Software Changes | Implementation of SMUD as an EIM Entity  |
| BPM Changes                  | EIM BPM will be updated if needed to reflect new modeling scenarios identified during implementation and feedback from SMUD.                     |
| Market Simulation            | December 3, 2018 – January 31, 2019  |
| Parallel Operations          | February 1, 2019 – March 31, 2019  |
| Notes:                       | Parallel Operations completed successfully.<br>Production Activation completed successfully on 04/03. BANC-SMUD is now participating in the EIM. |

| Milestone Type        | Milestone Name               | Dates                       | Status |
|-----------------------|------------------------------|-----------------------------|--------|
| Tariff                | File Readiness Certification | Mar 01, 2019                | ✓      |
| Market Sim            | Market Sim Window            | Dec 03, 2018 - Jan 31, 2019 | ✓      |
| Parallel Operations   | Parallel Operations          | Feb 01, 2019 - Mar 31, 2019 | ✓      |
| Production Activation | EIM - BANC-SMUD              | Apr 03, 2019                | ✓      |

# 2019 Independent

# Independent 2019 – Overview

|  | Board Approval | External BRS | Config Guide | Tech Spec | Draft Tariff** | BPMs     | External Training | Market Sim / Ext Testing Start | Production Activation |
|--|----------------|--------------|--------------|-----------|----------------|----------|-------------------|--------------------------------|-----------------------|
| <b>Independent 2019 - Overview</b>                             |                |              |              |           |                |          |                   |                                |                       |
| EIM Resource Sufficiency Enhancements – Capacity & Sufficiency | N/A            | 02/22/19     | N/A          | 02/20/19  | N/A            | 02/14/19 | 03/25/19          | 04/01/19                       | 05/06/19              |
| LMC Transparency Enhancement                                   | N/A            | 11/19/18     | 10/19/18     | N/A       | N/A            | 10/19/18 | N/A               | N/A                            | 05/01/19              |

## Notes:

Items in **BLUE** are complete  
 Items in **PURPLE** indicate a new date.

\*TBD items may be inapplicable, or they may have undetermined dates

\*\*Draft Tariff dates have been updated to show only the draft tariff posting. FERC Filing dates can be seen on individual project slides.

# 2019 – EIM Resource Sufficiency Enhancements

| Project Info                 | Details/Date  |
|------------------------------|---|
| Application Software Changes | <p><b>EIM:</b> Perform Capacity Test and Flex Ramp Up/Down Sufficiency Test Enhancements</p> <ul style="list-style-type: none"> <li>• Apply Tolerance Threshold to Flex Ramp Sufficiency Test of 1% or 1MW threshold, whichever greater</li> <li>• Both Bid Range Capacity and Flex Ramp Sufficiency Test evaluations shall independently pass/fail for each 15min interval of next trade hour at T-70, T-55, and T-40</li> <li>• Apply new Bid Range Capacity Test rule where failure of one 15min interval of trade hour results in failure of same 15-minute interval for Flex Ramp Sufficiency Test</li> </ul> <p><b>BAAOP:</b> EIM Operator displays shall be modified to:</p> <ol style="list-style-type: none"> <li>1) Present EIM BAA Sufficiency Test status results in 15min granularity for Bid Range Capacity and Flex Ramp Up/Down Sufficiency Tests (Balancing or Feasibility Test status results remain hourly)</li> <li>2) Provide Bid Range Capacity Test results with 15min granularity</li> </ol> <p><b>RTM (RTPD, RTD):</b> Apply EIM transfer limits based on 15-minute Sufficiency Test results:</p> <ul style="list-style-type: none"> <li>• EIM Transfer for 15min interval failing FRU/FRD limited from below/above (import/export) to least restrictive of: <ul style="list-style-type: none"> <li>○ EIM Transfer in previous 15min interval from last successful FMM, or</li> <li>○ Base EIM Transfer schedule in current 15min interval from current FMM</li> </ul> </li> </ul> <p><i>See Technical Specifications note below regarding CMRI and OASIS impacts to data. No changes will be made to the data structure of API technical specifications (e.g. same data schema and broadcast service), but the data context and, in the case of OASIS, enumerations will change with the transition to 15min granularity.</i></p> <p><i>Note: No settlement impact.</i></p> |
| BPM Changes                  | <ul style="list-style-type: none"> <li>• Energy Imbalance Market</li> <li>• Market Instruments</li> <li>• Market Operations</li> </ul>  |

# 2019 – EIM Resource Sufficiency Enhancements

| Project Info                    | Details/Date  |
|---------------------------------|---|
| <p>Technical Specifications</p> | <p>CMRI and OASIS API technical specifications will <i>not</i> be modified, although the following changes in data context will occur:</p> <p><b>CMRI:</b></p> <ul style="list-style-type: none"> <li>• <i>Energy Imbalance Market &gt; Bid Range Capacity Test Results</i> report shall transition from reporting hourly result in either UP or DOWN direction (one record) to reporting the most-insufficient 15-minute time interval of trade hour in both UP and DOWN direction (two records)</li> <li>• Bid Capacity and Flex sufficiency values (reported as negative insufficiency) will be provided for each 15min interval (instead of zero value) to clarify EIM BAA's proximity to insufficiency thresholds</li> </ul> <p><b>OASIS:</b></p> <ul style="list-style-type: none"> <li>• <i>Energy &gt; EIM Transfer Limits</i> report (which was previously deprecated in 2015) will be re-purposed to provide the IMPORT and EXPORT Net EIM Transfer Limits for binding 15min/5min RTM intervals impacted by Flex Ramp Up/Down Sufficiency Test failure (by EIM Balancing Authority Area)</li> <li>• The API name (existing) for the OASIS report is "<i>ENE_EIM_TRANSFER_LIMITS</i>"</li> <li>• Pre-existing report data (from 2015) reflecting "High" and "Low" Limit Types will remain; this implementation will provide "Import" and "Export" Limit Types for the report's re-purposed use</li> </ul> <p>No formal structured scenarios will be schedule for Market Simulation, but test environment will be available to allow external participants to test impacts to their business processes.</p> <p><i>Example results will be provided in forthcoming external business requirements specification (External BRS) document.</i></p> |

## 2019 – EIM Resource Sufficiency Enhancements – Capacity & Sufficiency

| Milestone Type        | Milestone Name  | Dates        | Status |
|-----------------------|---|--------------|--------|
| Board Approval        | Obtain Board of Governors Approval                          | N/A          |        |
| External BRS          | Milestone: Post External BRS (v1.0)                         | Jan 16, 2019 | ✓      |
|                       | Milestone: Post External BRS (v1.1)                         | Jan 25, 2019 | ✓      |
|                       | Milestone: Post External BRS (v1.2)                         | Feb 22, 2019 | ✓      |
| Config Guides         | Post Draft Config Guides                                    | N/A          |        |
| Tech Spec             | Create ISO Interface Spec (OASIS Tech spec)                 | Feb 20, 2019 | ✓      |
| Tariff                | File Tariff   | N/A          |        |
| BPMs                  | Post Draft Business Practice Manual changes (1% Threshold)  | Jan 22, 2019 | ✓      |
|                       | Post Draft Business Practice Manual changes (Non-Threshold) | Feb 14, 2019 | ✓      |
| External Training     | Deliver External Training                                   | Mar 25, 2019 | ✓      |
|                       | Post External CBT Online                                    | Mid-Apr 2019 |        |
| External Testing      | Capacity & Sufficiency - External Testing Starts            | Apr 01, 2019 | ✓      |
| Production Activation | EIM Resource Sufficiency 1% Threshold                       | Feb 15, 2019 | ✓      |
|                       | EIM Resource Sufficiency Cap & Sufficiency                  | May 6, 2019  |        |

# 2019 – LMC Transparency Enhancement

| Project Info                 | Details/Date  |
|------------------------------|---|
| Application Software Changes | <p>Logical Meter Calculation (LMC) enhancements will provide additional transparency for ISO market participant dynamic system resources (non ISO-pollled) by providing LMC Allocation Factors used to determine the 5-minute settlement interval meter value as a bill determinant. Allocation Factor bill determinants become available for settlement dates on or after May 1, 2019.</p> |

| Milestone Type        | Milestone Name                    | Dates        | Status |
|-----------------------|-----------------------------------|--------------|--------|
| External BRS          | Post External BRS                 | Nov 19, 2018 | ✓      |
| Config Guides         | Post Config Guides                | Oct 19, 2018 | ✓      |
| BPMs                  | Post Draft BPM changes – PRR 1102 | Oct 19, 2018 | ✓      |
| Market Simulation     | Market Sim Window                 | N/A          |        |
| Production Activation | LMC Transparency Enhancements     | May 1, 2019  |        |

# 2019 Fall Release

# Fall 2019 Release – Overview

|                                     | Board Approval | External BRS | Config Guide | Tech Spec*** | Mkt Sim Scenarios | Draft Tariff** | BPMs     | External Training | Market Sim          | Production Activation |
|-------------------------------------|----------------|--------------|--------------|--------------|-------------------|----------------|----------|-------------------|---------------------|-----------------------|
| <b>Fall 2019 Release - Overview</b> |                | 04/01/19     | 05/17/19     | 05/17/19     | 05/17/19          | 06/14/19       | 07/12/19 | 07/12/19          | 07/15/19 – 08/30/19 | 10/01/19              |
| CCDEBE Phase 1                      | 03/22/18       | 04/05/19     | N/A          | 05/17/19     | TBD               | 06/14/19       | 07/12/19 | 07/11/19          | 07/15/19 – 08/30/19 | 10/01/19              |
| ESDER Phase 3A                      | 09/05/18       | 03/20/19     | 05/17/19     | 05/02/19     | TBD               | 04/15/19       | 06/20/19 | 07/10/19          | 07/15/19 – 08/30/19 | 10/01/19              |
| RMR and CPM Enhancements            | 03/28/19       | 04/01/19     | 05/17/19     | TBD          | TBD               | TBD            | 07/12/19 | 07/12/19          | 07/15/19 – 08/30/19 | 10/01/19              |
| LMPM - Enhancements                 | 03/28/19       | 04/01/19     | N/A          | 05/17/19     | TBD               | 06/14/19       | 07/12/19 | 07/12/19          | 07/15/19 – 08/30/19 | 10/01/19              |
| EIM Enhancements 2019               | N/A            | 02/05/19     | TBD          | TBD          | TBD               | N/A            | TBD      | TBD               | 07/15/19 – 08/30/19 | 10/01/19              |

## Notes:

Items in **BLUE** are complete

Items in **PURPLE** indicate a new date.

Items in **RED** indicate a new date which is later than the target date listed on the overview line.

\*TBD items may be inapplicable, or they may have undetermined dates

\*\*Draft Tariff dates have been updated to show only the draft tariff posting. FERC Filing dates can be seen on individual project slides.

\*\*\*Fall 2019 Release Technical Specifications will be published at <https://developer.aiso.com>; **this site requires sign-up for access**

# Fall 2019 Release – System Interface Changes (Preliminary)

| System | Project  | Change Type | Description  | MAP Stage    | Production Activation | Technical Specifications  | Artifacts |
|--------|----------|-------------|--|--------------|-----------------------|---|-----------|
| CMRI   | CCDEBE1  | New         | participant to retrieve final default commitment cost  | Jul 15, 2019 | Oct 1, 2019           | May 17, 2019<br><a href="https://developer.caiso.com/">https://developer.caiso.com/</a> |           |
| CMRI   | CCDEBE1  | Modify      | participant to retrieve default bid curve at hourly level and include DEB source (cost type/ exante process) |              |                       |   |           |
| CMRI   | LMPME    | Modify      | DefaultBidCurves_v1 XSD change to remove enumeration from XSD  |              |                       |   |           |
| CMRI   | EIM 2019 | Modify      | include base schedule deviation in the balancing test results XSD  |              |                       |   |           |
| DRRS   | ESDER3A  | New         | DRRegistrationData   |              |                       |   |           |
| MF     | ESDER3A  | Modify      | GeneratorRDT_v4 XSD for additional bid dispatchable option for PDR   |              |                       |   |           |
| MF     | LMPME    | Modify      | GeneratorRDT_v4 XSD change to add default/alternate bilateral hub, max horizon cap value, and new DEB type   |              |                       |   |           |
| SIBR   | CCDEBE1  | New         | participant to submit exante bid and commitment  |              |                       |   |           |
| SIBR   | CCDEBE1  | New         | participant to retrieve submitted exante bid and commitment  |              |                       |   |           |
| SIBR   | CCDEBE1  | New         | participant to retrieve final exante bid and commitment  |              |                       |   |           |

# Fall 2019 – Commitment Cost and Default Energy Bid Enhancements Ph1

| Project Info                 | Details/Date   |
|------------------------------|--|
| Application Software Changes | <p><b><u>Scope:</u></b><br/>           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>• Support integration of renewable resources through incentivizing flexible resources participation during tight fuel supply</li> <li>• Account for costs of flexible resources (gas and non-gas) to reduce risk of insufficient cost recovery</li> <li>• Encourage participation of non-RA and voluntary EIM resources; compliance with FERC Order 831</li> <li>• Raises energy bid cap from \$1,000/MWh to \$2,000/MWh:</li> <li>• Requires supporting verified costs of energy bids above \$1,000/MWh</li> <li>• Introduces market power mitigation (MPM) measures for commitment costs.</li> </ul> <p><b><u>Impacted Systems:</u></b></p> <ul style="list-style-type: none"> <li>• SIBR: <del>Incorporate negotiated default commitment bids, allow the submittal of Ex Ante cost adjustments. Increase commitment cost caps, increase energy bid caps, incorporate soft energy bid cap. Allow for hourly submittal of minimum load bids into day-ahead market.</del></li> <li>• IFM/RTM: <del>Add MPM tests for commitment costs. Mitigate commitment costs where tests indicate market power. Incorporate MPM (both energy and commitment) in short term unit commitment process. Recalibrate the penalty price parameters in response to raising energy bid cap to \$2,000/MWh.</del></li> <li>• CMRI: <del>Provide resource-specific reporting on mitigation results for commitment costs. Provide additional source information for default bids.</del></li> <li>• MQS/PCA: <del>Incorporate mitigation of commitment costs for specific exceptional dispatch (ED) types. Incorporate bid locking of commitment costs for ED instructions and for certain cases where resources are uneconomic to operating.</del></li> <li>• Master File: <del>Allow submittal of resource-specific minimum load costs for costs that are independent of the Pmin level. Add the ability to indicate preference for new negotiated cost basis type. Provide a view of resource-specific scalars used for validating Ex-Ante cost adjustments.</del></li> <li>• CIDI: <del>Incorporate templates for Submitting request for manual consultation and ex-post default bid adjustments.</del></li> </ul> |

# Fall 2019 – Commitment Cost and Default Energy Bid Enhancements Ph1

| Project Info             | Details/Date  |
|--------------------------|---|
| 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> |

| 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 revised external BRS                         | Jan 22, 2019                | ✓      |
|                       | Update External BRS: Reference Level Adjustments     | Apr 05, 2019                | ✓      |
|                       | Update External BRS: Phase 1/Phase 2, clarifications | Mar 28, 2019                | ✓      |
| Config Guides         | Config Guide   | N/A                         |        |
| Tech Spec             | Publish Technical Specifications                     | May 17, 2019                |        |
| Tariff                | File Tariff (possibly multiple filings)              | Jun 14, 2019                |        |
| BPMs                  | Post Draft BPM changes                               | Jul 12, 2019                |        |
| External Training     | Deliver external training                            | Jul 11, 2019                |        |
| Market Sim            | Market Sim Window                                    | Jul 15, 2019 - Aug 30, 2019 |        |
| Production Activation | CCDEBE   | Oct 01, 2019                |        |

# Fall 2019 – ESDER Phase 3a – Bid Dispatchable Option

| Project Info                 | Details/Date   |
|------------------------------|--|
| Application Software Changes | <p><b><u>Scope:</u></b><br/>The ESDER 3a scope of the larger ESDER3 initiative will include two (2) demand response enhancements:</p> <ul style="list-style-type: none"><li>• New bid dispatchable options for demand response resources</li><li>• Removal of single LSE requirement for PDR registrations &amp; removal of default load adjustment (DLA)</li></ul> <p>Additionally, for ESDER2 Tariff Compliance, following is being implemented as part of this project</p> <ul style="list-style-type: none"><li>• Customer Load Baseline Submittal</li></ul> <p><b><u>Impacted Systems (Overview):</u></b></p> <p><b>Master File:</b></p> <ul style="list-style-type: none"><li>• RDTs for PDR registrations in MF will require selection of an effective Bid Dispatchable Option to be used for market optimization and dispatch</li></ul> <p><b>DRRS:</b></p> <ul style="list-style-type: none"><li>• PDR registrations will not require all service accounts to have the same LSE</li></ul> <p><b>SIBR:</b></p> <ul style="list-style-type: none"><li>• Will apply Net Benefit Test price criteria for PDR bids and reject those not meeting the applicable criteria</li><li>• Will not allow Bid Dispatchable Options to be changed in SIBR</li></ul> <p><b>HASP/RTM:</b></p> <ul style="list-style-type: none"><li>• Will use effective Bid Dispatchable Option registered in MF (e.g., 5-min, 15-min or Hourly) for market optimization and dispatch instructions</li><li>• Will broadcast new PDR energy schedules/awards and instructions to downstream applications</li></ul> |

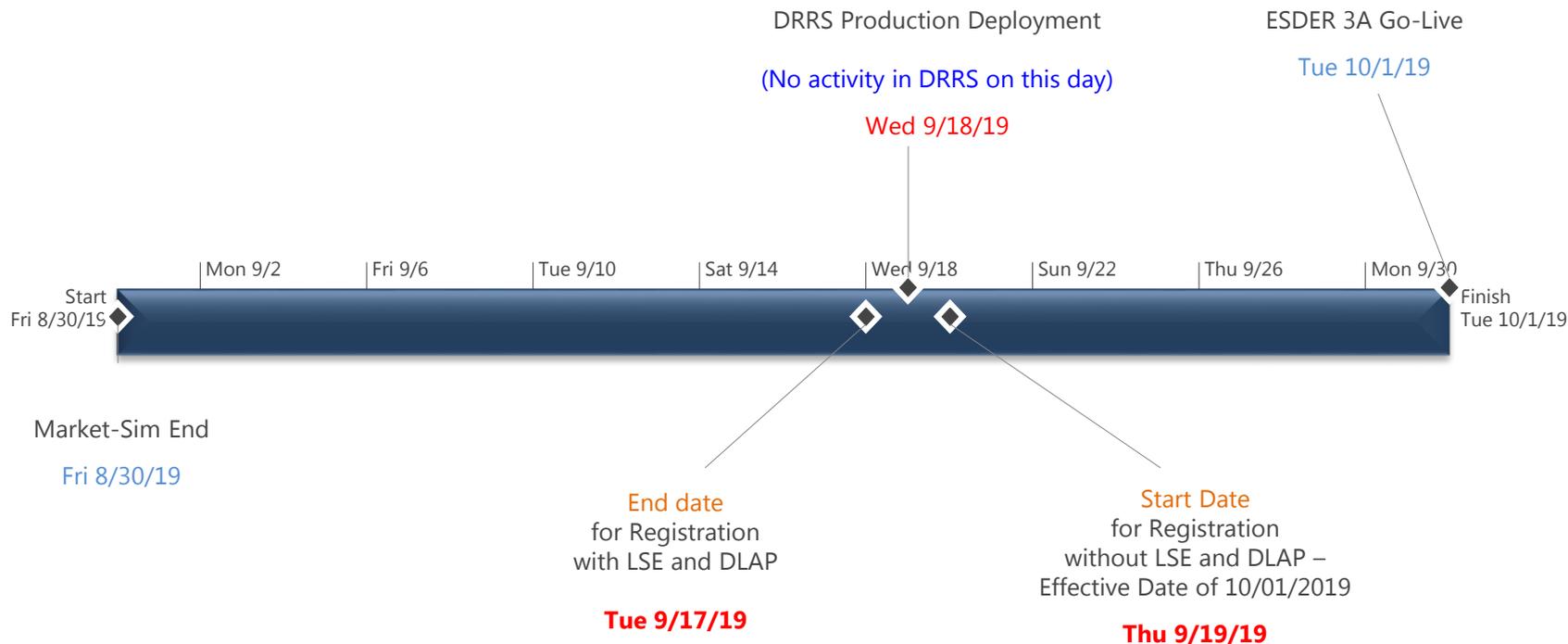
# Fall 2019 – ESDER Phase 3a – Bid Dispatchable Option (cont.)

| Project Info                                | Details/Date   |
|---|--|
| Application Software Changes<br>(continued) | <p><b>Settlements:</b></p> <ul style="list-style-type: none"> <li>• Will remove the default load adjustment (DLA) application</li> <li>• Will provide Bid Cost Recovery for PDRs with 15-Minute Bids but not Hourly Bids</li> </ul> <p><b>CMRI:</b></p> <ul style="list-style-type: none"> <li>• Will include energy schedules and awards for PDRs with new Bid Dispatchable Options (Existing)</li> </ul> <p><b>MRI-Settlements (ESDER2 Tariff Compliance):</b></p> <ul style="list-style-type: none"> <li>• New BASE measurement type for monitoring calculated baseline data</li> </ul> |
| BPM Changes                                 | Market Operations, Market Instruments, Outage Management, Settlements and Billing  |
| Tariff Change                               | 4.13 and 11.6  |

| Milestone Type        | Milestone Name  | Dates                       | Status |
|-----------------------|---|-----------------------------|--------|
| Board Approval        | Obtain Board of Governors Approval                          | Sep 05, 2018                | ✓      |
| External BRS          | Post External BRS   | Feb 11, 2019                | ✓      |
|                       | Post Revised External BRS                                   | Feb 25, 2019                | ✓      |
|                       | Post Revised External BRS as per scope change for Fall 2019 | Mar 20, 2019                | ✓      |
| Config Guides         | Post Draft Config Guides                                    | May 17, 2019                |        |
| Tech Spec             | Publish Technical Specifications                            | May 02, 2019                |        |
| Tariff                | Post Draft Tariff   | Apr 15, 2019                |        |
|                       | File Tariff   | Jul 01, 2019                |        |
| BPMs                  | Post Draft BPM changes                                      | Jun 20, 2019                |        |
| External Training     | External Training   | Jul 10, 2019                |        |
| Market Sim            | Market Sim Window   | Jul 15, 2019 - Aug 30, 2019 |        |
| Production Activation | ESDER Phase 3a - Bid Dispatchable Option                    | Oct 01, 2019                |        |

# Fall 2019 – ESDER Phase 3a – Bid Dispatchable Option (cont.)

## Proposed DRRS Transition Timeline



# Fall 2019 – RMR and CPM Enhancements

| Project Info                        | Details/Date  |
|-------------------------------------|---|
| <p>Application Software Changes</p> | <p><b><u>Scope:</u> POLICY STAKEHOLDER REVIEW STILL IN PROGRESS</b></p> <p>RMR and CPM Enhancements will address the following policy and tariff amendment scope:</p> <ul style="list-style-type: none"> <li>• Risk-of-Retirement will transition from CPM to RMR Tariff section</li> <li>• RMR units with new contracts shall:               <ul style="list-style-type: none"> <li>Have reliability capacity allocated by TAC Area (for PTOs, not LSEs), Flex RA credit shall be applied</li> <li>Receive Must-Offer Obligation (MOO)</li> <li>Subject to RAAIM</li> <li>Streamline RMR invoicing, settlement process through inclusion in ISO Settlement process</li> </ul> </li> </ul> <p>CPM units shall have pricing formulation for resources offering CPM above soft-offer cap (<a href="#">formulation TBD</a>)</p> <p><b><u>Impacted Systems (Overview):</u></b></p> <p><b>Master File:</b></p> <ul style="list-style-type: none"> <li>• New resource RMR contract type flag to distinguish RMR units with contracts signed prior to (“pre-existing”) vs. after (“new”) the Interim RMR Agreement Tariff Amendment was enacted.</li> </ul> <p><b>CIRA:</b></p> <ul style="list-style-type: none"> <li>• New features to both qualify (e.g. confirm EFC is defined) and allocate System/Local/Flex reliability capacity by TAC Area (for PTOs) for RMR units with new contract type:               <ul style="list-style-type: none"> <li>• Apply Flex RA credit by TAC Area (for PTOs)</li> <li>• Perform RMR Substitution</li> <li>• Support RMR Risk-of-Retirement</li> </ul> </li> <li>• Like RA resources, new contract type RMR units will receive RAAIM status determination</li> </ul> <p><b>SIBR</b></p> <ul style="list-style-type: none"> <li>• Like RA resources, automatically generates cost-based energy bids for new contract type RMR units for un-submitted bid range below RMR contract capacity               <ul style="list-style-type: none"> <li>• Bids will reflect applicable GHG Compliance costs, SC charges, Major Maintenance Adder (MMA), or Opportunity Costs (OC); Note: MMA and OC will only be applied for Unit Commitment/Economic Dispatch decisions in market (will not be recovered in settlement)</li> </ul> </li> <li>• Removes self-schedule requirement for new contract type RMR units scheduled/dispatched in Day-Ahead Market</li> </ul> |

## Fall 2019 – RMR and CPM Enhancements (cont.)

| Project Info                 | Details/Date  |
|------------------------------|---|
| Application Software Changes | <p><b><u>Impacted Systems (Continued):</u></b></p> <p><b>IFM/RTM:</b></p> <ul style="list-style-type: none"> <li>• Unit Commitment, Economic Dispatch decisions will include applicable MMA and OC</li> <li>• Like RA resources, new contract type RMR units will have automatic RA Obligation (\$0/MWh bids in RUC)</li> </ul> <p><b>Settlements:</b></p> <ul style="list-style-type: none"> <li>• RMR units under new contract type will receive: <ul style="list-style-type: none"> <li>• Replacement of existing RMR invoice and settlement with standard ISO settlement process</li> <li>• Monthly RMR capacity payment (by resource) and cost allocation (by PTO)</li> <li>• RAAIM settlement/allocation</li> <li>• Bid Cost Recovery (does not include MMA or OC)</li> <li>• True-ups for RMR Condition 2 overpayment (does not include MMA or OC)</li> </ul> </li> <li>• CPM units with offers above soft-offer cap may receive true-up based on CPM pricing formulation (<a href="#">formulation TBD</a>)</li> </ul> |
| BPM Changes                  | Reliability Requirements, Market Operations, Market Instruments, Settlements and Billing  |
| Tariff Change                | 11.13, 31.2.2, 34.1, 40.9, 41, 43, 43A, Appendix G  |

| Milestone Type        | Milestone Name                   | Dates                       | Status |
|-----------------------|----------------------------------|-----------------------------|--------|
| Board Approval        | Board of Governors Approval      | Mar 28, 2019                | ✓      |
| External BRS          | Post External BRS                | Apr 01, 2019                | ✓      |
| Config Guides         | Publish Config Guide             | May 17, 2019                |        |
| Tech Spec             | Publish Technical Specifications | TBD                         |        |
| Tariff                | File Tariff w/ FERC              | TBD                         |        |
| BPMs                  | Post Draft BPM changes           | Jul 12, 2019                |        |
| External Training     | Deliver External Training        | Jul 12, 2019                |        |
| Market Sim            | Market Sim Window                | Jul 15, 2019 - Aug 30, 2019 |        |
| Production Activation | RMR and CPM Enhancements         | Oct 01, 2019                |        |

# Fall 2019 – Local Market Power Mitigation Enhancements

| Project Info                 | Details/Date  |
|------------------------------|---|
| Application Software Changes | <p><b>Scope:</b> Prevent Flow reversal, Limits transfer, DEB for Hydro, Reference level adjustment process, Gas price Indices</p> <p><b>Impacted Systems:</b></p> <p><b>RTM: Prevent flow reversal</b><br/>           Eliminate rule mitigate in FMM carry to RTD<br/>           Eliminate rule mitigate for balance of hour for FMM, balance 15 minute for RTD<br/>           Use current market competitive LMP for mitigation<br/>           Add a nominal parameter to mitigated bids<br/>           Mitigated bid = MAX (DEB, Competitive LMP + \$0.xx parameter)</p> <p><b>RTM: Limit transfers to limit Economic Displacement</b><br/>           Optional rule for EIM BAA<br/>           Limit transfers to the greater of exports in MPM and flexible ramping requirements<br/>           Export Limit = MAX [ExportsBase, ExportsMPM, <math>\Sigma FRUMPMAward</math>]<br/>           The exporting BAA will receive congestion rents created by this proposed rule</p> <p><b>OASIS:</b> Publish EIM transfer limit</p> <p><b>CMRI:</b> Display new Hydro DEB type</p> <p><b>Master File:</b> Option to limit transfer per a defined rule<br/>           Manage Hydro DEB eligibility at resource level<br/>           New field to select and rank hydro DEB option<br/>           Store resource's maximum storage horizon<br/>           Identify default trading hubs for hydro resources, requests changes to additional hubs<br/>           Ability to view parameters and ranking of approved hydro DEBs</p> |
| BPM Changes                  | Market Operations, Market Instruments   |
| Tariff Change                | Section 29.39, 31.2.1, 39.7   |

## Fall 2019 – Local Market Power Mitigation Enhancements (cont.)

| Milestone Type        | Milestone Name                   | Dates                       | Status |
|-----------------------|----------------------------------|-----------------------------|--------|
| Board Approval        | Board of Governors Approval      | Mar 28, 2019                | ✓      |
| External BRS          | Post External BRS                | Apr 01, 2019                | ✓      |
| Config Guides         | Post Draft Config Guides         | N/A                         |        |
| Tech Spec             | Publish Technical Specifications | May 17, 2019                |        |
| Tariff                | File Tariff                      | Jun 14, 2019                |        |
| BPMs                  | Post Draft BPM changes           | Jul 12, 2019                |        |
| External Training     | Deliver external training        | Jul 12, 2019                |        |
| Market Sim            | Market Sim Window                | Jul 15, 2019 - Aug 30, 2019 |        |
| Production Activation | LMPM - Enhancements              | Oct 01, 2019                |        |

# Fall 2019 – Energy Imbalance Market Enhancements 2019

| Project Info                 | Details/Date   |
|------------------------------|--|
| Application Software Changes | <p><b>Scope:</b><br/>Implement 21 EIM enhancements requested by EIM entities through Customer Inquiry, Dispute and Information system (CIDI)</p> <p><b>Impacted Systems:</b><br/> <b>BAAOP:</b> Add displays for BAA overview, Unit deviations, Load Bias, transfer limits, contingency flag, timestamps, and other identified items. Enhance sorting and layouts ability. Enhance alarm ability for market thresholds.<br/> <b>BSAP:</b> Enhance capability for Base schedule modification, Add aggregated BS deviation in API.<br/> <b>OASIS or CMRI:</b> <del>Display ROC limits</del> Display 5-min market transmission Loss<br/> <b>RTM:</b> prevent ETSR swing using explicit triggers.<br/> <b>ADS:</b> Publish current DOP in the MSG transition period.<br/> <b>Settlement:</b> Publish data for UFE shadow calculation; Settle EIM Resource Deviation within Regulation/ABC range as instructed regulation energy.<br/> <b>CMRI:</b> Publish resource limit values</p> |
| BPM Changes                  | Market Instruments, Energy Imbalance Market  |

| Milestone Type        | Milestone Name                        | Dates                       | Status |
|-----------------------|---------------------------------------|-----------------------------|--------|
| Board Approval        | Obtain Board of Governors Approval    | N/A                         |        |
| External BRS          | Milestone: Post External BRS          | Feb 05, 2019                | ✓      |
| Config Guides         | Design review - BPM and Tariff SMEs   | TBD                         |        |
| Tech Spec             | Create ISO Interface Spec (Tech spec) | TBD                         |        |
| Tariff                | File Tariff                           | N/A                         |        |
| BPMs                  | Post Draft BPM changes                | TBD                         |        |
| External Training     | External Training                     | TBD                         |        |
| Market Sim            | Market Sim Window                     | Jul 15, 2019 - Aug 30, 2019 |        |
| Production Activation | EIM Enhancements 2019                 | Oct 01, 2019                |        |

# 2020 Spring Release

# Spring 2020 – EIM integrations for SCL, LADWP, and SRP

| Project Info                 | Details/Date  |
|------------------------------|---|
| Application Software Changes | Implementation of SCL, LADWP, and SRP as EIM Entities   |
| BPM Changes                  | EIM BPM will be updated if needed to reflect new modeling scenarios identified during implementation and feedback from SCL, LADWP, and SRP. |
| Market Simulation            | December 2019 – January 2020  |
| Parallel Operations          | February 2020 – March 2020  |

| Milestone Type        | Milestone Name               | Dates                        | Status |
|-----------------------|------------------------------|------------------------------|--------|
| Tariff                | File Readiness Certification | March 2020                   |        |
| Market Sim            | Market Sim Window            | December 2019 – January 2020 |        |
| Parallel Operations   | Parallel Operations          | February 2020 – March 2020   |        |
| Production Activation | EIM – SCL, LADWP, SRP        | April 2020                   |        |

# 2020 Independent

# 2020 – ADS Replacement

| Project Info                 | Details/Date  |
|------------------------------|---|
| Application Software Changes | <ul style="list-style-type: none"> <li>• Transition to web-based user interface to eliminate the need to install thick client</li> <li>• Transition ADS provisioning to the Access and Identity Management (AIM) application including Resource Level Access Controls (RACL) access</li> <li>• The query tool will provide 30 days of historical data</li> <li>• Various user interface enhancements adding content per Operation's request</li> <li>• ADS B2B services changes - TBD.</li> </ul> |
| BPM Changes                  | <ul style="list-style-type: none"> <li>• Market Instruments</li> <li>• Market Operations</li> </ul>   |

| Milestone Type        | Milestone Name                      | Dates        | Status |
|-----------------------|-------------------------------------|--------------|--------|
| Board Approval        | Obtain Board of Governors Approval  | N/A          |        |
| External BRS          | Post External BRS                   | Aug 06, 2018 | ✓      |
| ADS Update            | ADS Update Meeting                  | Aug 15, 2018 | ✓      |
| Config Guides         | Design review - BPM and Tariff SMEs | N/A          |        |
| Tech Spec             | Publish Technical Specifications    | TBD          |        |
| Tariff                | File Tariff                         | TBD          |        |
| BPMs                  | Post Draft BPM changes              | TBD          |        |
| External Training     | Conduct External Training           | TBD          |        |
| Market Sim            | Market Sim Window                   | Q2 2020      |        |
| Production Activation | ADS Replacement                     | Q2 2020      |        |
| Production            | ADS Parallel Operations             | Q2 2020      |        |
| Decommission          | Old ADS Decommission                | TBD          |        |

# 2020 Fall Release

# Fall 2020 – Day-Ahead Market Enhancements Phase 1

| Project Info                 | Details/Date   |
|------------------------------|--|
| Application Software Changes | <p><b>Scope:</b><br/> <b>Phase 1: 15-minute Granularity DAM</b></p> <ul style="list-style-type: none"> <li>• 15 minute bids in DAM and RTM</li> <li>• 15 minute scheduling and settlement in DAM</li> <li>• 15 minute Base schedule in RTM</li> </ul> <p><b>Impacted Systems:</b><br/> <b>ALFS:</b> 15 minute Load and VER forecasts<br/> <b>SIBR:</b> SC submit bids for energy, AS in 15 min interval in DAM and RTM, InterSC Trade is in 15 minute<br/> <b>MPM:</b> Market Power Mitigation in 15 minute in DAM<br/> <b>ETCC:</b> <i>Transmission Contract limits in 15 minute interval for DAM</i><br/> <b>IFM/RUC:</b></p> <ul style="list-style-type: none"> <li>• Calculate AS (RegU, RegD, Spin, NSP) requirements in 15 minute interval</li> <li>• Co-optimize Energy, AS, TD: 15 minute interval</li> <li>• TD+X: hourly intervals, need normalize the cost for mixed intervals</li> <li>• Hourly Block energy scheduling constraint for eligible resources elect the block option, intertie, RDRR and PDR.</li> <li>• AS on interties can only be procured from 15-minute dispatch-able resources</li> </ul> <p><b>BSAP:</b> <i>Submit Base Schedules in 15 minute interval, energy and AS</i><br/> <b>BASI:</b> <i>Balance test, capacity test, and sufficiency test are in 15 minutes in RTM</i><br/> <b>RTM:</b> Receive DAM 15 minute award Energy, AS; Receive EIM BAA submit 15 minute base Schedule.<br/> <b>CMRI:</b> report 15 minute IFM awards, include Energy and AS. Base schedule test results by 15 minute interval<br/> <b>OASIS:</b> Display IFM Energy and AS requirements and results in 15 minute intervals; 15-Minute RTM LAP Price report<br/> <b>Settlement:</b></p> <ul style="list-style-type: none"> <li>• All energy, include physical energy supply, virtual supply/demand, load from all resources are settled at the LMP: <math>\lambda + MCC + MLC</math> in 15 minute interval</li> <li>• AS is settled in 15 minute interval</li> <li>• CRR Settled at DAM congestion cost component in 15-minute interval</li> <li>• GMC \$1 divided by 4 for IST</li> <li>• GMC market service portion will apply to AS bids</li> <li>• Administrative price use relevant DAM 15 minute price.</li> <li>• Make whole payment for price correction made to load and block export.</li> <li>• 15 minute bidding exports get BCR</li> </ul> <p><b>EMS:</b> receive DAM schedule in 15 minute interval</p> |
| BPM Changes                  | Market Instruments, Market Operations, Energy Imbalance Market (EIM), Settlements & Billing  |
| Tariff Change                | Yes  |

# Fall 2020 – Dispatch Operating Target Tariff Clarification

| Project Info                 | Details/Date  |
|------------------------------|---|
| Application Software Changes | <p><b>Scope:</b><br/>Allow Energy Intermittent Resources (EIRs) to automate their response to operational instructions that require the resource not to exceed their `</p> <p><b>Impacted Systems:</b><br/> <b>RTM:</b> Operator can select EIR resources, system to send Operating instruction Flag to ADS<br/> <b>ADS:</b> Receive Operating instruction flag for EIRs. Broadcast message to EIRs operator.</p> |
| BPM Changes                  | Market Instruments<br>Market Operations   |
| Tariff Change                | Changes tariff language from “Operating Order” to “Operating Instruction” in multiple sections.   |

| Milestone Type        | Milestone Name                                 | Dates        | Status |
|-----------------------|--|--------------|--------|
| Board Approval        | Obtain Board of Governors Approval             | Jul 26, 2018 | ✓      |
| External BRS          | Milestone: Post External BRS                   | Dec 26, 2018 | ✓      |
| Config Guides         | Design review - BPM and Tariff SMEs            | N/A          |        |
| Tech Spec             | Create ISO Interface Spec (Tech spec)          | TBD          |        |
| Tariff                | Draft Tariff                                   | TBD          |        |
|                       | File Tariff                                    | TBD          |        |
| BPMs                  | Post Draft BPM changes                         | TBD          |        |
| External Training     | Deliver External Training                      | TBD          |        |
| Market Sim            | Market Sim Window                              | TBD          |        |
| Production Activation | Dispatch Operating Target Tariff Clarification | Oct 01, 2020 |        |

# Fall 2020 – Intertie Deviation Settlement

| Project Info                 | Details/Date  |
|------------------------------|---|
| Application Software Changes | <p><b>Scope:</b><br/>Implement a new Under/Over Delivery Charge for intertie deviations from Market Schedule and After-The-Fact (ATF) E-Tag, to replace Decline charge</p> <p><b>Impacted Systems:</b><br/><b>Settlements</b></p> <ul style="list-style-type: none"> <li>• Calculate FMM binding intertie award, exclude Curtailment, calculate under/over delivery quantity as deviation of schedule and ATF E-Tag, Charge under/over delivery Charge at 50% of RTD LMP.</li> <li>• Remove the decline charge calculation and Decline Threshold</li> <li>• Allocate Over/Under delivery charge to measured demand</li> </ul> |
| BPM Changes                  | Settlements and Billing   |
| Tariff Change                | Section 11.31   |

| Milestone Type        | Milestone Name                   | Dates        | Status |
|-----------------------|----------------------------------|--------------|--------|
| Board Approval        | Board of Governors Approval      | Feb 07, 2019 | ✓      |
| External BRS          | Post External BRS                | TBD          |        |
| Config Guides         | Post Draft Config Guide          | TBD          |        |
| Tech Spec             | Publish Technical Specifications | TBD          |        |
| Tariff                | File Tariff                      | TBD          |        |
| BPMs                  | Post Draft BPM changes           | TBD          |        |
| External Training     | Deliver External Training        | TBD          |        |
| Market Sim            | Market Sim Window                | TBD          |        |
| Production Activation | Intertie Deviation Settlement    | Oct 01, 2020 |        |

# Fall 2020 – ESDER Phase 3b – Load Shift Product

| Project Info                 | Details/Date   |
|------------------------------|--|
| Application Software Changes | <p><b><u>Scope:</u></b></p> <p>The ESDER 3b initiative will include two (2) demand response enhancements:</p> <ul style="list-style-type: none"><li>• Addition of a Load Shift Product wherein demand response resources with behind the meter (BTM) storage devices can participate in both load consumption and load curtailment.</li><li>• Enable sub-metered electric vehicles supply equipment (EVSE) to participate in load curtailment</li></ul> <p><b><u>Impacted Systems (Overview):</u></b></p> <p><b>Master File:</b></p> <ul style="list-style-type: none"><li>• Registration of new PDR Resource Types and business rules for PDRs with BTM storage devices and wanting to participate in both Load Curtailment and Consumption</li><li>• Two (2) Resource IDs will be assigned to the same Resource to allow Consumption versus Curtailment participation (PDR-LSR)</li></ul> <p><b>DRRS:</b></p> <ul style="list-style-type: none"><li>• Allow two resource IDs to be selected for registrations with LSR baseline methods</li><li>• New baseline methods for PDR-LSRs and EVSEs</li><li>• New attribute for locations to indicate BTM device</li></ul> <p><b>CIRA:</b></p> <ul style="list-style-type: none"><li>• Will prevent the request of NQC for PDR-LSR Consumption resources</li></ul> |

## Fall 2020 – ESDER Phase 3b – Load Shift Product

| Milestone Type        | Milestone Name  | Dates        | Status |
|-----------------------|---|--------------|--------|
| Board Approval        | Obtain Board of Governors Approval                          | Sep 05, 2018 | ✓      |
| External BRS          | Post External BRS   | TBD          |        |
|                       | Post Revised External BRS                                   | TBD          |        |
|                       | Post Revised External BRS as per scope change for Fall 2019 | TBD          |        |
| Config Guides         | Post Draft Config Guides                                    | TBD          |        |
| Tech Spec             | Publish Technical Specifications                            | TBD          |        |
| Tariff                | Post Draft Tariff   | TBD          |        |
|                       | File Tariff   | TBD          |        |
| BPMs                  | Post Draft BPM changes                                      | TBD          |        |
| External Training     | External Training   | TBD          |        |
| Market Sim            | Market Sim Window   | TBD          |        |
| Production Activation | ESDER Phase 3b - Load Shift Product                         | Oct 01, 2020 |        |

# 2021 Spring Release

# Spring 2021 – EIM integrations for PSC-NM and NWE

| Project Info                 | Details/Date   |
|------------------------------|--|
| Application Software Changes | Implementation of PSC-NM 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 PSC-NM and NWE. |
| Market Simulation            | December 2020 – January 2021   |
| Parallel Operations          | February 2021 – March 2021   |

| Milestone Type        | Milestone Name               | Dates                        | Status |
|-----------------------|------------------------------|------------------------------|--------|
| Tariff                | File Readiness Certification | March 2021                   |        |
| Market Sim            | Market Sim Window            | December 2020 – January 2021 |        |
| Parallel Operations   | Parallel Operations          | February 2021 – March 2021   |        |
| Production Activation | EIM – PNM and NWE            | April 2021                   |        |

# 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 sim calls for major releases will be market noticed
  - 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 |
|   | 5  | 6  | 7   | 8  | 9   | 10  |
|   | <p><b>WebCONF: Market Simulation</b><br/>2:00pm - 3:00pm</p>   | <p><b>Training: Get to Know the ISO - Day 1</b><br/>9:00am - 4:00pm</p> <p><b>WebCONF: Imbalance Conformance Enhancements</b><br/>10:00am - 12:00pm</p> <p><b>WebCONF: Technical User Group</b><br/>10:00am - 11:00am</p>                                      | <p><b>Deadline: Comments - Interconnection Process Enhancements 2018 - Issue Paper and Meeting Discussion</b></p> <p><b>Training: Get to Know the ISO - Day 2</b><br/>9:00am - 4:00pm</p> <p><b>Meeting: Flexible Resource Adequacy Criteria Must Offer Obligation Phase 2 - Revised Draft Flexible Capacity Framework</b><br/>10:00am - 4:00pm</p> <p><b>WebCONF: Market Settlement User Group</b><br/>10:00am - 11:00am</p> | <p><b>Meeting: Audit Committee Teleconference (Executive)</b><br/>3:30pm - 6:30pm</p> <p><b>Training: Settlements 101</b><br/>9:00am - 4:00pm</p> <p><b>Meeting: 2017-2018 Transmission Planning Process</b><br/>10:00am - 4:00pm</p> <p><b>WebCONF: Market Simulation</b><br/>2:00pm - 3:00pm</p> | <p><b>Training: Settlements 201</b><br/>9:00am - 4:00pm</p> |     |
| 11  | 12   | 13   | 14  | 15   | 16  | 17  |
| <p><b>WebCONF: Participating Transmission Owner Per Unit Cost Guides</b><br/>10:30am - 12:00pm</p> <p><b>WebCONF: Market Simulation</b><br/>2:00pm - 3:00pm</p> | <p><b>Meeting: Congestion Revenue Rights Auction Efficiency</b><br/>10:00am - 4:00pm</p> <p><b>WebCONF: Release User Group</b><br/>10:00am - 11:00am</p> <p><b>Call: Energy Imbalance Market Governing Body Teleconference (Executive)</b><br/>11:30am - 12:30pm</p> | <p><b>Deadline: Submissions - April 2018 Monthly Resource Adequacy and Supply Plans</b></p> <p><b>Call: Congestion Revenue Rights</b><br/>11:00am - 11:30am</p> <p><b>WebCONF: Outage Management System Customer Partnership Group</b><br/>2:00pm - 3:00pm</p> | <p><b>Deadline: Comments - Review Transmission Access Charge Structure Straw Proposal and Meeting Discussion</b></p> <p><b>Call: Board of Governors Teleconference (General)</b><br/>3:15pm - 6:00pm</p> <p><b>Call: Board of Governors Teleconference (Executive)</b><br/>9:00am - 10:00am</p> <p><b>Call: Market Update</b><br/>10:15am - 11:00am</p> <p><b>WebCONF: Market Simulation</b></p>                              |  |   |     |

Market Sim



Market Sim



Release Users Group (RUG)

