BONNEVILLE POWER ADMINISTRATION

IMPLEMENTATION KICKOFF
Oct. 28, 2020
INTRODUCTION

Nita Zimmerman, Chief Business Transformation Officer
Allie Mace, Director of Grid Modernization
AGENDA

• EIM Implementation Roadmap
• EIM-specific grid modernization projects
• Grid modernization portfolio impact
• Future topics
• Open question and answer session
Five Phases to EIM Decision

2022

Exploration July 2018 – June 2019
Implementation agreement June – Sept. 2019
Close-out Aug. – Sept. 2021
EIM PARTICIPATION PRINCIPLES

1. Bonneville’s participation is consistent with its statutory, regulatory and contractual obligations.

2. Bonneville will maintain reliable delivery of power and transmission to its customers.

3. Bonneville’s participation is discretionary and Bonneville retains its ability to effectively exit the market in the event participation is no longer consistent with these principles.

4. Bonneville’s participation is consistent with a sound business rationale.

5. Bonneville’s participation is consistent with the objectives of Bonneville’s Strategic Plan.

6. Bonneville’s evaluation of EIM participation includes transparent consideration of the commercial and operational impacts on its products and services.
EIM IMPLEMENTATION ROADMAP

Sarah Burczak, Stakeholder Engagement Lead
Roger Bentz, EIM Program Manager
<table>
<thead>
<tr>
<th>MILESTONES KEY</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Critical path activity or milestone</strong></td>
</tr>
<tr>
<td><strong>Other grid modernization project milestones</strong></td>
</tr>
<tr>
<td>ACRONYMS IN THE ROADMAP</td>
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<tr>
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<tr>
<td>CBC</td>
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<tr>
<td>SQMD</td>
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<td>VER</td>
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Additional resource: [CAISO's Glossary](#)
BPA PUBLIC PROCESSES

BPA Public Process

Phase III: Policy
- Early November Final Phase III Decision Document
- 10/28 Implementation Kickoff Workshop

Phase IV: BP-22 Rate Case & TC-22 Terms and Conditions Tariff Proceeding
- TBD Workshop

Phase V: Close-out
- 9/30 EIM Close-out Letter

Today

2020
- April
- July
- Oct.

2021
- Jan.
- April
- July
- Oct.

2022
- Jan.
- April
- July
EIM IMPLEMENTATION KICKOFF | ROADMAP
BPA PROGRAM AND PROCESSES

Submit and validate GRDTs and IRDTs for Master File

Submit SQMD plans (Metering Review and Update)

- 10/5 EESC draft policies and procedures
- 5/5 EESC processes approved
- 6/15 Systems completed
- 1/1 Draft processes for bid and base scheduling
- 5/28 CBC Integration of billing and settlements systems
- 6/30 Framework for EIM charge code allocations
- 6/30 VER forecasting changes completed
- 10/1 Settlements configuration complete

11/24 Staff recommendation: Non-federal resources may submit request to become participating resource

Settlements training
BPA EIM INTEGRATED PROGRAM ROADMAP

**BPA Public Process**

- **Phase III: Policy**
  - Early November: Final Phase III Decision Document
  - 10/28: Implementation Kickoff

- **Phase IV: BP-22 Rate Case & TC-22 Terms and Conditions Tariff Proceeding**
  - TBD: Workshop
  - TBD: Workshop

- **Phase V: Close-out**
  - 9/30: EIM Close-out Letter

**CAISO**

- System implementation
  - Connectivity Testing
  - Joint Integration Testing
  - Market Simulation
  - Parallel Operations

- Joint Integration Testing
  - DITL: 10/1 EA Signed
  - 12/1 EA Approved by FERC
  - 3/2: Go Live

**BPA Program and Projects**

- Submit and validate GRDTs and IRDTs for Master File
  - 10/5: EESC draft policies and procedures approved
  - 5/5: EESC processes approved
  - 6/15: Systems completed

- Submit SQMD plans (Metering Review and Update)
  - 1/1: Draft processes for bid and base scheduling
  - 6/30: Framework for EIM charge code allocations
  - 10/1: Settlements configuration complete

- CBC Integration of billing and settlements systems
  - 5/28: VER forecasting changes completed

**Program and Projects**

- Staff recommendation: Non-federal resources may submit request to become participating resource

**Version:** Oct. 26, 2020
EIM BID AND BASE SCHEDULING

Roger Bentz, EIM Program Manager
PROJECT DESCRIPTION

Maintain & Submit Base Schedules
Establishes the capability to maintain and submit base schedules for resources (both participating and non-participating), interchange and EIM transfers.

Bid Participating Resources
Delivers the organizational and system capabilities required to allow BPA to bid participating resources into the EIM.

Implements Transmission Donations
Develops the ability to implement transmission donations.

Synchronizes Processes Internally
Synchronizes processes with other grid modernization projects including:
- Price and Dispatch Analysis.
- Load and Renewable Forecasting.
- Federal Data and Generation Dispatch Modernization.
- EIM Real-Time Operations.
WHY DO WE NEED IT?

- Submit balancing authority area schedules and bids to EIM to enable participating federal resources to be awarded for dispatches to meet EIM-area imbalances.
- Meet power balance constraints by ensuring BPA has sufficient generation to cover its load and obligations.
- Meet EIM flexible resource and ramping requirements.
- Enable market transfers by making EIM BAA-to-BAA interchange path capacity available to the market engine.

Source: CAISO’s Regional Collaboration site
WHAT ARE THE BENEFITS?

Provide accurate data to the market to help ensure it runs efficiently.

Maximize the value of BPA’s resources by participating in the EIM.

Leverage automation to improve internal process efficiency.
### WHAT IS CHANGING FOR CUSTOMERS?

<table>
<thead>
<tr>
<th>Basis for imbalance</th>
<th>Schedules at T-57 establish the basis for imbalance (based on current proposal).</th>
</tr>
</thead>
<tbody>
<tr>
<td>Customer e-tags</td>
<td>Customers e-tags are used as the basis for providing base schedules to the market.</td>
</tr>
<tr>
<td>Interchange rights</td>
<td>Transmission rights holders voluntarily donate interchange rights for the market to use for EIM dispatches.</td>
</tr>
<tr>
<td>Non-federal owners</td>
<td>Non-federal generation owners have option to pursue bidding capacity into the EIM.</td>
</tr>
<tr>
<td>Bid submission</td>
<td>Participating resource owners submit bids into the market by T-75.</td>
</tr>
<tr>
<td>Market awards</td>
<td>Participating resources receive market awards as per CAISO’s EIM timelines.</td>
</tr>
</tbody>
</table>
Bonneville Power Administration

KEY MILESTONES

Sept. 2020 (Completed): Contract for EIM software vendor executed

Jan. 2021: Draft business process development complete

June 2021: EIM software installed & configured

June 2021: Software integrated with other systems

Feb. 2022: System and process training complete

March 2022: System testing complete
EIM REAL TIME OPERATIONS

Brent Kingsford, *Dittmer Dispatch Supervisor*
Enables BPA’s power and transmission operations to:

- Communicate operational conditions to the EIM.
- Integrate market dispatches through automatic generation control.
- Convey impacts of real-time events to the market.

Provide operational limits to the market.

Provide variable energy forecasts to the market as well as plant operators.
WHY DO WE NEED IT?

• Enable EIM participation and maintain transmission reliability by ensuring BPA tools and processes effectively support market participation.

• Optimize use of imbalance energy by ensuring that the market appropriately accommodates reliability constraints while dispatching economically-optimized imbalance market.

• Improve congestion relief efficiency by leveraging market resources to avoid running into constraints.
WHAT ARE THE BENEFITS?

- Capitalize on reliability benefits of security-constrained market dispatches.
- Provide improved operational visibility for the balancing authority area.
- Leverage automation to drive process efficiency.
- Maximize the value of BPA's resources by participating in the EIM.
<table>
<thead>
<tr>
<th>Variable energy forecasts</th>
<th>Forecasts will have five-minute granularity.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Variable energy forecast services</td>
<td>Services will reflect EIM scheduling timelines.</td>
</tr>
<tr>
<td>Energy for balancing the BA</td>
<td>Market will optimize every five minutes from offered resources.</td>
</tr>
</tbody>
</table>
May 2020 (Completed): Inventory of required EESC processes

Oct. 2020 (Completed): Publish draft of internal EESC process changes and procedures that will be changing identified

March 2021: Internal EESC process and procedure changes approved

Feb. 2022: System and process training complete

March 2022: System testing complete
EIM Settlements Implementation

Rasa Keanini, Settlements Product Owner
### Validate and submit settlement quality meter data
- Submit data to the CAISO for generation, load and interchange consistent with the approved SQMD plans.

### Review and validate settlements
- Review participating resource settlement statements from the CAISO for federal resources bid into the Market
- Review EIM Entity Scheduling Coordinator settlement statements from the CAISO.

### Calculate sub-allocations
- For any EESC settlement charge codes BPA determines to sub-allocate in the rate and tariff proceedings.

### Support transmission customers
- Billing of sub-allocated EESC charge codes.
- Enable access to relevant settlement statement and invoice causational data for sub-allocated EIM charge codes.

### Manage disputes
- Manage EESC and PRSC invoice disputes with the CAISO.
- Administer and manage transmission customer disputes of sub-allocated EIM charge codes.
WHY DO WE NEED IT?

Cost-effective participation
Support BPA’s cost-effective participation in the EIM for BPA and BPA’s transmission customers.

Fairness, accuracy and conformity
Create EIM settlements that represent fair and accurate allocations.

Quality and visible reporting
Create quality reporting of EIM settlements and visibility of underlying data.

Optimization of BPA’s EIM marketing and operations
Leverage EIM participation results to serve as an input to optimizing BPA’s EIM marketing and operations.
WHAT ARE THE BENEFITS?

- Improved and automated settlements processes through standardized settlements systems and functions.
- Enable holistic market analytics and settlement validations to make better informed market participation decisions.
- Enhanced system capabilities that increase flexibility to meet future needs of customers and industry changes.
- Maximize the value of BPA’s and the region’s resources.
### WHAT IS CHANGING FOR CUSTOMERS?

<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Direct settlements with market operator</strong></td>
<td>The EESC and PRSCs will settle directly with the CAISO, the market operator.</td>
</tr>
<tr>
<td><strong>EIM settlements bill</strong></td>
<td>BPA transmission customers will receive an EIM Settlements bill directly with the sub-allocated EIM charges.</td>
</tr>
<tr>
<td><strong>Non-sub-allocated charge codes</strong></td>
<td>EIM entity charge codes that are not sub-allocated will be embedded in BPA’s transmission rates.</td>
</tr>
<tr>
<td><strong>Visibility</strong></td>
<td>Visibility to backup documentation for EIM charges and credits will be provided to BPA transmission customers who receive sub-allocated EIM charges.</td>
</tr>
<tr>
<td><strong>Dispute management</strong></td>
<td>The EESC and PRSC will manage disputes directly with the CAISO. Transmission Customers will manage any disputed charges/credits with BPA’s EESC settlements team.</td>
</tr>
</tbody>
</table>
BONNEVILLE POWER ADMINISTRATION

KEY MILESTONES

Sept. 2020 (Completed):
Vendor selected, design completed & implementation plan developed

Oct. 2020:
Stand up new settlements organization

Feb. 2021:
Settlements organizations staffed and onboarded

March 2021:
Staff trained and processes developed

June 2021:
Allocation logic and interface to billing developed

Oct. 2021:
System configuration and build complete

Feb. 2022:
System & process training complete

March 2022:
System testing complete
EIM TESTING PROGRAM

Jim Viskov, Manager Critical Business Systems
Operations and Development
**Ensures readiness**

Implements a structured and focused testing program to ensure BPA is prepared for participation in the Western Energy Imbalance Market.

**Manages end-to-end testing**

Creates and executes a testing plan that includes connectivity testing, integration testing, day-in-the-life testing, market simulation testing and parallel operations testing.

**Creates a repeatable and permanent testing capability for BPA**

Creates a repeatable testing capability and will provide long-term support of BPA’s participation in the EIM.
WHY DO WE NEED IT?

Provide operational assurance to enable the market interconnection
Ensure base configuration data properly enables BPA to function in the market and that the interconnected systems and processes effectively work together.

Instill confidence that BPA can transact and carry out obligations
Instill confidence in market participation while still carrying out BPA’s obligations to its customers and the region.

Meet CAISO’s requirements
Meet EIM testing requirements demonstrating that BPA’s implementation of EIM systems and processes are operational and consistent with the CAISO’s requirements.
WHAT ARE THE BENEFITS?

Ensure the systems and processes supporting BPA’s participation in the EIM function accurately, timely and consistently.

Provide testing capability that meets CAISO’s requirements, which are a prerequisite to be able to join the EIM.

Provide permanent, repeatable end-to-end and regression testing capabilities.
Project sponsor/leadership check-in meetings
- Participants: Business line points of contact, lead sponsors
- Timing: Monthly, moving to bi-weekly as approach the start of testing phases

Test Case Working Group
- Participants: QA from each team and led by the test coordinator
- Timing: Weekly; prior to the first project starting test case development

Test result coordination meetings
- Participants: Test Coordinator, Integration Coordinator, QA from each team, project managers/scrum masters and business line POCs
- Timing: Regular cadence

CAISO Track 4 coordination meetings
- Alignment and planning for formal testing phases
**KEY MILESTONES**

- **April 2021:** Parallel environment built
- **May 2021:** Connectivity testing completed
- **Aug. 2021:** Joint integration testing completed
- **Sept. 2021:** CAISO day-in-the-life testing completed
- **Nov. 2021:** Market simulation testing completed
- **Feb. 2022:** Parallel operations testing completed
- **Oct 2022:** Permanent EIM regression testing capability established
EIM TRAINING PROGRAM

Jamey Turner, *Program Analyst*
The EIM Training program will:

- Create a **structured and coordinated approach** to training BPA managers and staff involved in EIM activities.
- Provide the **right amount of EIM knowledge** and skill at the right times.
- Include mechanisms to **retain and grow capabilities** over time.
WHY DO WE NEED IT?

Build needed skill sets

Increase the likelihood of successful operation in the EIM due to building the necessary skills and knowledge among staff executing impacted roles.

Increase assurance

Build assurance with BPA managers, executives and customers that staff have the necessary knowledge and skill to perform their EIM roles.

Coordinate delivery

Ensure a sufficient, coordinated delivery of training such that trainees will gain the necessary knowledge at the optimal time during the phased EIM implementation.
WHAT ARE THE BENEFITS?

Giving staff involved in EIM roles more targeted, technical training will prepare BPA to experience market benefits sooner.

Training and proficiency will bring improved decision making, communications and accountability across BPA.

A ready and prepared workforce allows BPA to achieve the studied reliability and financial benefits, and share them with customers.
WHAT IS CHANGING FOR CUSTOMERS?

- Customers will need to interpret EIM Settlements statements.

- Potential changes to interfacing with BPA due to EIM business practices and data submittal timelines.
Aug. 2020 (Completed): EIM roles identified

Dec. 2020: Publish training design & delivery plan and calendar

Aug. 2021: Workforce ready for day-in-the-life testing

Sept. 2021: Workforce ready for market simulation testing

Nov. 2021: Workforce ready for parallel operations testing

Feb. 2022: Workforce ready for go live
GRID MODERNIZATION PORTFOLIO IMPACT

Allie Mace, Director of Grid Modernization
Grid Modernization Roadmap

As of 10/14/2020 – Subject to Change

**Mission Critical IT**
- Real-time Operations Modernization (P)
  - EIM Settlements Scoping (E)
  - Reliability Coordinator Decision, Planning & Execution (C)
  - Power Services Training Program (C)
  - Federal Data & Generation Dispatch Modernization (C)
  - Outage Tracking System (OTS) (P)
  - Coordinated Transmission Agreement (CTA) Implementation (P)
  - Energy Trading & Risk Management & MSS Expansion (C)
  - Mission Critical IT – Integration (C)
  - Mission Critical IT – Infrastructure (C)
  - RAS Automatic Arming (P)
  - Outage Management System (P)
  - One BPA Outage (N)
  - Mission Critical IT – Service Management (C)

**Energy Trading**
- Coordinated Transmission Agreement (CTA) Implementation (P)

**AGC Modernization (C)**
- AGC Modernization (C)

**Mission Critical IT – Architecture (C)**
- AGC Modernization (C)

**Data Analytics (P)**
- Data Analytics (P)

**Customer Billing Center Replacement (P)**
- Agency Metering System (AMS) Replacement (P)
  - Agency Metering System (AMS) Replacement (P)
  - Price & Dispatch Analyst (PRA) (C)
  - Sub-hourly Scheduling on the DC (P)
  - Load & Renewable Forecasting (C)
  - Short-Term Available Transfer Capability (N)

**Projects in “Identify”**
- EIM Settlements Scoping (E)
  - Reliability Coordinator Decision, Planning & Execution (C)
  - Power Services Training Program (C)
  - Federal Data & Generation Dispatch Modernization (C)

**Projects in “Deliver”**
- AGC Modernization (C)

**Projects in “Integrate”**
- Agency Metering System (AMS) Replacement (P)

**Projects not started**
- Agency Metering System (AMS) Replacement (P)

**Legend**
- E – EIM Project
- C – Critical for EIM
- P – Partially Critical for EIM
- N – Not Critical for EIM
- - Completed Projects
  - - Projects in “Deliver”
  - - Projects in “Identify, Define, Integrate”
  - - Projects not started
KEY MILESTONES

April 2021: Metering Review and Update create and submit SQMD plans.

May 2021: Customer Billing Center Replacement integrates with settlements system.

June 2021: VER forecasting changes.

June 2021: AGC Modernization development of real-time interface to CAISO’s BAAOP API.

June 2021: Agency Metering System Replacement capability to create meter values per SQMD plans.


IMPACT TO NON-EIM PROJECTS

• Have re-prioritized other grid modernization work to focus first on EIM-readiness.
• Delayed project will resume post-go live.
FUTURE TOPICS

Sarah Burczak, Stakeholder Engagement Lead
## TOPICS

<table>
<thead>
<tr>
<th>California sales and GHG accounting</th>
<th>When BPA issued the EIM Policy Record of Decision, it did not have authority to purchase carbon allowances. Now that BPA has been granted authority to purchase allowances, it needs to decide whether or not to sell into California.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Settlements and billing</td>
<td>More information and training on settlements and billing as projects mature and decisions are made in the rates and tariff proceedings.</td>
</tr>
<tr>
<td>EIM governance</td>
<td>While BPA has said existing governance is not a barrier to joining the market, the Governance Review Committee has partnered with CAISO to propose changes to the current governance structure. BPA will continue to track these changes to ensure it does not change its view on governance.</td>
</tr>
</tbody>
</table>
HOW TO SUBMIT IDEAS AND FEEDBACK

Please send your feedback on future topics or questions you would like to cover in future workshops to techforum@bpa.gov by Tuesday Nov. 10.
QUESTIONS?

For more information, visit [www.bpa.gov/goto/eim](http://www.bpa.gov/goto/eim).