<table>
<thead>
<tr>
<th>Time</th>
<th>Topic</th>
<th>Speaker</th>
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<tbody>
<tr>
<td>1 to 1:05 p.m.</td>
<td>Welcome, safety moment, introductions</td>
<td>Allie Mace</td>
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<td></td>
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<td><em>Director of Grid Modernization</em></td>
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<td>1:05 to 1:30 p.m.</td>
<td>Grid modernization overview</td>
<td>Allie Mace</td>
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<td>1:30 to 1:45 p.m.</td>
<td>FY 2022 and FY 2023 spending levels</td>
<td>Allie Mace</td>
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<tr>
<td>1:45 to 2 p.m.</td>
<td>Question and answer session</td>
<td>Allie Mace</td>
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Bonneville Power Administration

35+ GRID Modernization
BPA 2018–2023
Strategic Goals

#1 STRENGTHEN FINANCIAL HEALTH

#2 MODERNIZE ASSETS & SYSTEM OPERATIONS

#3 PROVIDE COMPETITIVE PRODUCTS & SERVICES

#4 MEET CUSTOMER NEEDS EFFICIENTLY & RESPONSIVELY
1. Support a More Reliable, Efficient and Effective System
2. Reduce Future Costs
3. Create New Market Opportunities
<table>
<thead>
<tr>
<th>Project Description</th>
<th>FY 2018</th>
<th>FY 2019</th>
<th>FY 2020</th>
<th>FY 2021</th>
<th>FY 2022</th>
<th>FY 2023</th>
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Legend:
- E - EIM Project
- C - Critical for EIM
- P - Partially Critical for EIM
- N - Not Critical for EIM
- Complete Projects
- Projects in “Deliver”
- Projects in “Identify, Define, Integrate”
- Projects not started
Grid Modernization/Energy Imbalance Market Subcommittee

Oversee Grid Modernization and EIM project delivery. Decide program scope, budget and priority and solve significant risks and issues.

Chairperson: Director of Grid Modernization
Members: Executives and managers from Power, Transmission and Corporate

- Grid Modernization Portfolio
- EIM Implementation Sponsor Team
- Stakeholder Engagement Working Group
- Extended Day Ahead Market Working Group
- California Awareness Working Group
PORTFOLIO MANAGEMENT

Identify
- Create common understanding of a proposal to address a business opportunity or problem.
- Evaluate if there is enough potential value to invest further effort.

Define
- Establish desired value.
- Analyze impact of change on business in terms of people, process, technology and policy.
- Start outlining potential business capabilities that may close existing gaps.

Integrate
- Plan and secure resourcing and sequencing of work.
- Identify and validate interdependencies across projects and organizations.

Deliver
- Execute defined work.
- Measure success in terms of value delivered to the business.
MOBILIZATION STATUS

Identify
Define
Integrate
Deliver
Complete

AGC Modernization
Agency Enterprise Portal
Agency Metering System Replacement
Automated Operations Planning & Reliability Assessment
BPA Network Model
Customer Billing Center Replacement
Data Analytics
EIM Bid & Base Scheduling
EIM Real Time Operations
EIM Settlements Implementation
Federal Data & Generation Dispatch Modernization
Metering Review & Update
Mission Critical IT – Infrastructure
Mission Critical IT – Integration
Outage Management System
Power Services Training
RAS Automatic Arming
Reliability Coordinator Decision, Planning & Execution
ST Available Transfer Capability
Sub-Hourly Scheduling on the DC

EIM Training Project
EIM Testing Program
Load & Renewable Forecasting
Mission Critical IT – Re-Platforming
Price & Dispatch Analysis
Real Time Ops Modernization

CTA Implementation
EIM Settlements Scoping
Energy Trading & Risk Management & MMS Expansion
Marketing & Settlements System
Mission Critical IT – Architecture
Mission Critical IT – Service Management
Outage Tracking System
One BPA Outage

0% 0% 18% 59% 23%
• Automated Operations Planning and Reliability Assessment
  – Enables automation of case development to enhance and optimize transmission system operations.
  – Allows study engineers to perform more studies which can reduce margin in system operating limits and allow for more sophisticated analysis.

• Remedial Action Scheme Automatic Arming
  – Automates the process of arming the most effective generation required to support the transmission capacity needed.
  – Reduce frequency and duration of generation arming and drop to minimize impacts to customers.

• Sub-Hourly Scheduling on the Pacific Direct Current Intertie
  – Eliminates manual processes to reduce chance of errors and will allow for BPA to be more responsible to customer requests.
• BPA Network Model
  – Improves accuracy of available surplus capacity to market.

• Outage Management System
  – Improves data accuracy and speed to enhance BPA’s real-time situational analysis for strategic decision-making and to ensure appropriate compliance reporting.
  – Automates business processes, which will eliminate redundant data entry and the potential of human error.

• Short-term Available Transfer Capability
  – Improves short-term ATC accuracy and forecasting by automating data inputs and outputs and using better commercial modeling assumptions informed by risk tolerance.
ENHANCED VISIBILITY

- AGC Modernization
  - Improve communication and transparency within BPA and between BPA, neighboring balancing authorities and FCRPS plant operators.
- Real-Time Operations Modernization
  - Provide clearer visualizations which will allow for more simplified and strategic decision making.
  - Decrease the amount of time to mine data to make operational decisions in order to operate the federal power and transmission system closer to its limits while maintaining reliability for customers.
- Reliability Coordinator Decision, Planning and Execution
  - Provides additional services including forward system (day-ahead and intra-day), 24-hour system analysis and look-ahead real-time contingency analysis.
Five Phases to Western EIM Decision

**2022**

- **Exploration** July 2018–June 2019
- **Implementation agreement** June–Sept. 2019
- **Policy decisions** Oct. 2019–Aug. 2020
- **BP-22 & TC-22** Nov. 2020–July 2021
- **Close-out** Late 2021
BPA anticipates a March 2, 2022, go-live date in the EIM.
BPA initiated five EIM-specific grid modernization projects in FY 2020 that are expected to conclude in FY 2022.
- EIM Bid and Base Scheduling
- EIM Real Time Operations
- EIM Settlements Implementation
- EIM Testing Program
- EIM Training Program
Further information on BPA’s implementation plan will be shared in stakeholder meetings this fall.
EIM IMPLEMENTATION

**Partially Critical for EIM**
- Agency Enterprise Portal
- Agency Metering System Replacement
- Automated Operations Planning and Reliability Assessment
- BPA Network Model
- Coordinated Transmission Agreement Implementation
- Customer Billing Center Replacement
- Data Analytics
- MCIT Re-platforming
- Outage Management System
- Outage Tracking System
- Real-time Operations Modernization
- Remedial Action Scheme Automatic Arming
- Sub-hourly Scheduling on the DC Intertie

**Critical for EIM**
- Automatic Generation Control Modernization
- Energy Trading and Risk Management and MSS Expansion
- Federal Data and Generation Dispatch Modernization
- Load and Renewable Forecasting
- Marketing and Settlements System
- MCIT Architecture
- MCIT Infrastructure
- MCIT Integration
- MCIT Service Management
- Metering Review and Update
- Power Services Training Program
- Price and Dispatch Analysis
- Reliability Coordinator Decision, Planning and Execution

**EIM-Specific Projects**
- EIM Bid and Base Scheduling
- EIM Real-Time Operations
- EIM Settlements Implementation
- EIM Settlements Scoping
- EIM Testing Program
- EIM Training Program
GRID MODERNIZATION IN
FY 2022 AND 2023
Grid modernization spending
In millions of dollars

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<th>Year</th>
<th>Actuals</th>
<th>Forecast</th>
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<td>FY 2023</td>
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</table>
FY 2022 AND FY 2023 SPENDING

• BP-22 is last rate period of incremental spending for the Grid Modernization Key Strategic Initiative.
• Incremental spending remains flat at $25 million, equal to spending levels in BP-18 and BP-20.
  – Spending will be split $12.5 million between FY 2022 and FY 2023.
• Allocation between Power Services and Transmission Services also remains consistent with BP-18 and BP-20.
  – 35% Power
  – 65% Transmission
<table>
<thead>
<tr>
<th>FY 2022</th>
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<tbody>
<tr>
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**Legend**

- **E** – EIM Project
- **C** - Critical for EIM
- **P** - Partially Critical for EIM
QUESTION AND ANSWER
For more resources on grid modernization, navigate to www.bpa.gov/goto/gridmodernization.

For more resource on BPA’s Western EIM process, head to www.bpa.gov/goto/eim.

Have a question that hasn’t been answered? Email gridmod@bpa.gov.
This information was publicly available on June 12, 2020, and contains information not sourced directly from BPA financial statements.