Energy Imbalance Markets in the West

Sierra Nevada Region
June 27, 2019

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Markets are here
Why is WAPA interested in Markets?

• Interest not new. Besides the April 2019 workshop; WAPA also hosted a similar workshops in 2016 and 2014 – committed to periodically reviewing market and industry trends and the way WAPA conducts business
  – UGP joined Southwest Power Pool
  – DSW and RMR pursued steps to form the Mountain West Transmission Group

• WAPA must respond as appropriate, to emerging industry trends so value/reliability of hydropower resource is maximized
  – Historically, markets were physically based, they are evolving into financially-based ones. WAPA and its customers need to be properly positioned so that we can continue to thrive in the new environment
Types of Market Structures

• Bi-lateral:
  – Between two parties
  – Entities determine generation fleet dispatch within BAA

• EIM:
  – BAs continue to serve load and dispatch generation
  – Real-time imbalance served by market
  – Uses generation and geographic diversity
  – Participation is voluntary

• Fully Integrated Market
  – All generation and load served by market
  – Day-Ahead and Real-time markets
  – No transmission reservations
CAISO Markets

- CAISO operates:
  - Fully integrated market
  - Voluntary Energy Imbalance Market (EIM)

- SNR is only examining CAISO EIM market
What is an Energy Imbalance Market?

- EIM is an automated, voluntary real-time energy wholesale market that matches the lowest cost electricity supply with demand for every 15 minutes, and dispatches in every 5 minutes.

- Centralized market that integrates many Renewables into the Grid by expanding access to non ISO members (BA) from another region/state and hence adding geographic diversity.

- Integrate more green energy into market. As production increases in one area, helps to offset reduction in other region.
EIM Basics

- The EIM software automatically finds the lowest cost resources across a larger region to meet immediate power needs, and hence reduces the cost.

- EIM Market provides economic benefits to the BA (Balancing Authorities) as it dispatches the least cost resources. EIM creates a modern cost effective GRID.

- EIM market has full visibility of Transmission and Generation Outages and that way manages congestion better on transmission lines and provide reliability.
EIM Basics (video)
EIM Characteristics

- Voluntary Market
- Geographical Diversity
- Relative easy entry/exit
- Retain control over assets and decision making
- Avoids exposure to full CAISO costs
- Dispatch efficiency and savings
- Resources can be participating or non-participating
- Transmission provided
Why WASN-SNR is looking at EIM Now

• BANC Phase II provides an opportunity for WAPA-SNR and Reclamation to explore EIM participation that may increase:
  – The value of the CVP;
  – Improve operational flexibility; and
  – Optimize generation scheduling and market value

• CVP Power Initiatives Recommendation – Flexible Use of CVP Hydro Generation
Why WAPA-SNR is looking at EIM Now

• Exploring membership in the EIM will allow WAPA-SNR to keep pace with industry changes and determine how the EIM will affect WAPA’s ability to accomplish its mission in more effective and beneficial way for its customers

• Economies/efficiencies of scale may exist -- It makes sense for WAPA-SNR to examine joining EIM in coordination with other BANC members
Statement of Principles

- Participation is consistent with statutory, regulatory, and contractual obligations.
- Maintain reliable delivery of power and transmission to our customers.
- CVP Resource participation in the EIM is and always will be voluntary and based on the ability of Reclamations authorities to participate.
- WAPA-SNR’s decision to participate in the EIM will be based on a sound business rationale.
EIM Costs

• Upfront Costs
  – Phase II BANC implementation costs
  – Phase II WAPA and Reclamation implementation costs

• On-going cost
  – BANC EIM Entity costs
  – CAISO EIM costs
EIM Activities

• Working with Reclamation to determine level of CVP participation
• Working with BANC to perform gap analysis of WAPA and Reclamation’s processes, tools and procedures.
## Gap Analysis of Tools, Processes, and Procedures to Implement EIM

<table>
<thead>
<tr>
<th>Primary System / Functional Area</th>
<th>Other Gap Areas</th>
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<tbody>
<tr>
<td>Generator Outage Submission</td>
<td>GRDT</td>
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<tr>
<td>Merchant DA &amp; RT EIM Bid/Base Schedule Submission</td>
<td>FNM</td>
</tr>
<tr>
<td>EIM Entity Operations</td>
<td>Load Forecast</td>
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<tr>
<td>Settlement: EIM Participating Resource</td>
<td>OATT Updates</td>
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<tr>
<td>Settlement: BANC EIM Entity</td>
<td>EIM Participating Resource Agreement</td>
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<td>After the Fact Analysis</td>
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<td>Meter Data Submission</td>
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<td>Generator Dispatch</td>
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# EIM Meeting Schedule

<table>
<thead>
<tr>
<th>Activity</th>
<th>Dates/Time</th>
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<tbody>
<tr>
<td>1&lt;sup&gt;st&lt;/sup&gt; EIM Meeting</td>
<td>Thursday, June 27, 2019</td>
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<tr>
<td>2&lt;sup&gt;nd&lt;/sup&gt; EIM Meeting</td>
<td>Tuesday, July 16, 2019</td>
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<tr>
<td>3&lt;sup&gt;rd&lt;/sup&gt; EIM Meeting</td>
<td>Tuesday, July 30, 2019</td>
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<tr>
<td>4&lt;sup&gt;th&lt;/sup&gt; EIM Meeting</td>
<td>Wednesday, August 14, 2019</td>
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<tr>
<td>EIM Decision</td>
<td>Friday, August 16, 2019</td>
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Please Note:
- All meetings will be held at WAPA offices (114 Parkshore Drive, Folsom, CA 95630), from 9:00 am – 12:00 pm
- WebEx will be available for all EIM meetings
EIM Information

• SNR EIM related information is posted on WAPA website at:

https://www.wapa.gov/regions/SN/PowerMarketing/Pages/western-eim.aspx
Send comments or concerns to:

SNREIM@WAPA.GOV

or

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