MARKETS

December 1, 2021
Webinar will begin at
9:00 a.m.MST / 8:00 a.m. PST
INTRODUCTION

BRUCE REW
SENIOR VP OF OPERATIONS
TODAY’S AGENDA

• Market Design Approach
• Market Products and Price Formation
• Transmission Availability
• Congestion Rent Allocation
• Market Monitor and Oversight
• Next Steps
Ideally a single co-optimized unit commitment and dispatch under a robust governance framework with an independent board.
## Incremental Possibilities

<table>
<thead>
<tr>
<th>Phase</th>
<th>Resource Adequacy</th>
<th>DA Market</th>
<th>RT Market</th>
<th>Transmission Planning</th>
<th>Transmission Service Provider</th>
<th>Balancing Authority</th>
<th>RC Services</th>
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<tbody>
<tr>
<td>Phase 1</td>
<td>WRAP</td>
<td>SPP Markets+</td>
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<td>RC (optional)</td>
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<td>Phase 2</td>
<td>WRAP</td>
<td>SPP Markets+</td>
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<td>RC (optional)</td>
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**Entities can choose whether and when to move into full RTO mode.**

**Full RTO Services**

RA | Day 2 Market | BAA/TSP Consolidation | RC
QUESTIONS?

INTRODUCTION TO MARKETS+
MARKET DESIGN APPROACH FOR MARKETS+

PHILIP BRUICH
DIRECTOR, MARKETS
SPP MARKET EXPERIENCE TIMELINE

SPP Energy Imbalance Service (EIS) market in Eastern Interconnect:
- Five-minute EIS market
- Day-ahead (DA) & hour-ahead supply adequacy calculation

SPP Integrated Marketplace (IM) & Forward Congestion Market (TCR):
- Hourly fully co-optimized DA unit commitment, energy & operating reserve market
- Five-minute fully co-optimized real time energy and operating reserve market
- Consolidated 16 legacy balancing authorities into one SPP balancing authority

SPP Western Energy Imbalance Service (WEIS) market launch in Western Interconnect:
- Five-minute EIS market
- DA and hour-ahead supply adequacy calculations
SPP’S OPEN, TRANSPARENT & INCLUSIVE APPROACH

- Goals always:
  - Ensure reliable operation of the bulk electric system
  - Ensure efficient operation of the market driving towards a least-cost solution
  - Provide accurate price signals that:
    - Reflect market conditions
    - Encourage investment
    - Incent performance
MARKET DESIGN: STAKEHOLDER OWNERSHIP

• Core structure begins with stakeholder working group:
  • Responsible for maintaining and enhancing governing documents that establish the market design, market products and market participation rules
  • Meet twice monthly during startup phase
  • Transition to monthly after design is complete

• Meetings are facilitated by SPP staff
  • Partnership between stakeholders and SPP
  • SPP staff provides guidance, expertise & research
  • SPP staff does not get a vote
MARKET DESIGN: STAKEHOLDER OWNERSHIP

• 360 degree information transfer between SPP and the stakeholders

• SPP staff, stakeholders, Market Monitoring Unit and other stakeholders bring new issues/concerns/changes

• Research is done by all parties: If the issue is large enough, a sub-group may be formed for more concentrated research and discussion

• Ultimately results in a revision request to change a certain aspect of the market
MARKET DESIGN: KEY QUESTIONS

• What issue/feature is ultimately being addressed?
• What solutions exist?
• Is there precedence set in another market that we can learn from?
• Are there regulatory hurdles to implementation (FERC, states, etc.)?
• How can we minimize implementation costs/performance impacts/changes to participant systems while maximizing the value the change provides to the market?
STAKEHOLDER PRIORITIZATION

• Stakeholders in SPP provide input on the prioritization of all phases of an enhancement
  • Inform design/research and implementation
  • SPP anticipates a similar process for Markets+

• SPP stakeholder prioritization is a collaborative process:
  • Enhancements to the market system, public data, etc. are prioritized by SPP and stakeholders
  • SPP conducts open meetings where stakeholders and staff discuss adjusting implementation priority

• SPP Roadmap is where future, prospective enhancements are prioritized by the stakeholders
Comprehensive and Strategic Approach to Organizational Initiative Management

SPP Roadmap Development Process

1. Process Training
2. Submit/Comment
3. Educate
4. Prioritize
5. Approve

Proactive, Feeds Design Development

Design Development Process

1. Research & analysis
2. Design
3. Approve
4. Stakeholder prioritization
5. Implement & validate

Reporting & Metrics

Ad-hoc Initiative Management

Each initiative follows a process of design, approval, prioritization and implementation
QUESTIONS?
MARKET DESIGN APPROACH
HIGH-LEVEL GOALS FOR EFFICIENT MARKETS

• Maintain **reliable operation** of the bulk electric system

• Ensure **efficient operation** of the market by minimizing the total production cost

• Provide **accurate price** signals
GOAL: RELIABLE OPERATION

- Sophisticated, robust network model
- Flow-based transmission constraints
- Centralized unit commitment & dispatch
- Diverse resource offer parameters
  - Appropriately reflect market impacts of the current and future resource mix
  - Ramp rates, startup/shutdown times, mins/maxes, etc.
- Reliability-based market products to account for grid deviations
  - Flexibility/reserve products
GOAL: EFFICIENT OPERATION

• Market should minimize the total production cost
• Market should generally produce savings relative to level of participation
• Market should benefit both the buyer and seller
GOAL: ACCURATE PRICE SIGNALS

• Reflect market conditions
• Encourage investment
• Incent performance
• Producers/suppliers of necessary products compensated appropriately
• Minimize out-of-market payments (uplift)
HIGH-LEVEL PRODUCT DISCUSSION

• Energy
  • Must be cleared in both DA and RT
  • Granularity: DA (hourly), RT (five-minute)
  • Virtual bidding in DA?
  • Capacity procurement to protect against virtual deviations?

• Flexible Reserve Procurement
  • DA and RT
  • Short-term ramping, longer-term ramping
  • SPP has developed 10-minute ramping capability and one-hour uncertainty product to deal with these deviations; open to other possibilities
HIGH-LEVEL PRODUCT DISCUSSION

• Reserve sharing
  • Potential for additional optimization within the existing RSG arrangements

• Other products?
  • Grid is changing rapidly.
  • SPP recognizes the need to be flexible given the pace at which the grid and environmental goals are moving
HIGH-LEVEL PRICE FORMATION PRINCIPLES

• Goal is to produce an LMP that is an accurate reflection of the needs of the grid and the cost to provide those needs

• High prices are not inherently bad, low prices are not inherently good. Accurate prices are the goal

• Price formation should consider all resources and dispatch the resources that have the attributes needed in a least-cost manner

• Price formation design decisions must be consistent with reliable and efficient market outcomes, with stakeholder input where applicable
## PRICE FORMATION KEY TOPICS

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<th>Fast Start Pricing</th>
<th>Scarcity Pricing</th>
<th>Mitigation</th>
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<td>• Adequately reflect the true cost of peaking units in the LMP when they participate in the market.</td>
<td>• Transparently reflect the lack of supply in market prices.</td>
<td>1. <strong>Reference level mitigation:</strong> Mitigate if deemed pivotal on defined paths &amp; offer price is above reference price.</td>
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<td>• SPP’s revised implementation for this goes live in May 2022.</td>
<td>• Parameters must balance diversity of willingness to pay for the product with incenting development/availability of supply to resolve the scarcity.</td>
<td>2. <strong>Conduct/impact mitigation:</strong> Mitigate if offer prices exceeds reference price by a defined threshold and has an impact on market outcomes above a defined level.</td>
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<td>• Open to discussion on whether this specific implementation would also meet Markets+ goals.</td>
<td>• SPP employs a sloping/graduated curve for all reserve products in an attempt to balance these areas.</td>
<td>• SPP has employed both.</td>
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<td>• Open to discussion on the specific parameters best suited for Markets+.</td>
<td>• We are using conduct/impact in both WEIS and RTO IM.</td>
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<td>• Open to discussion on approach for Markets+.</td>
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QUESTIONS?
MARKET PRODUCTS AND PRICE FORMATION
TRANSMISSION AVAILABILITY IN MARKETS+

STEVE JOHNSON
PRINCIPAL OPERATIONS SPECIALIST
TRANSMISSION AVAILABILITY

Goal: Maximize transmission available to Markets+ while:

- Maintaining transmission service provider (TSP) roles and responsibilities (planning, rate setting & terms of service)
- Preserving firm network and point-to-point rights
- Enabling base scheduling of energy, capacity and flexibility prior to Markets+ operating window
  - Transmission customers continue to deliver their resources to their loads
  - Respect statutory service obligations
TRANSMISSION AVAILABILITY – INITIAL THOUGHTS

• Base scheduling prior to Markets+ operating window to include imports and exports from Markets+ footprint
  • Import/export seams managed as a peer with stakeholder input on process
  • Markets+ Seams Advisory Group?
TRANSMISSION AVAILABILITY – INITIAL THOUGHTS

• **Goal:** Hurdle-free transmission across Markets+ footprint
  - Modest demand charge to make TSPs whole for Markets+ use (to mitigate cost shifts)?
  - WestConnect pricing approach or ?

• **Export or wheeling charges**
  - Provide for appropriate transmission revenue recovery
  - Efficient and equitable outcomes with neighboring TSPs
  - Who flows and how are value and costs allocated?
  - Honor existing firm Open-Access Transmission Tariff (OATT) rights
TRANSMISSION AVAILABILITY - INITIAL CONCEPTS

Prior to Markets+ Day-Ahead Market

Remains similar to today:
• TSP responsible for transmission planning, path or flowgate limits, etc.
• TSP defines ATRR, PTP and network rates.
• Firm OATT sales/redirects continue prior to market operating window.
• Participants may submit base schedules ahead of DA market using OATT rights.
• Participants may set aside firm transmission for other needs (e.g. balancing, reserves, etc.).
• BA role unchanged.

Markets+ Operating Window

DA and RT market window:
• Remaining transmission made available to Markets+.
• SCED optimization respecting TSP operational limits.
• Base schedules on firm OATT rights are respected and protected.
• Unscheduled firm OATT rights entitled to congestion rent.
• Minimize Markets+ transmission rate within footprint while recovering sufficient revenue to mitigate cost shifts.
• BA role unchanged.
TRANSMISSION AVAILABILITY – QUESTIONS TO PONDER

• Goal: Maximize transmission available to Markets+

• Is there an opportunity to make all unsold and unscheduled transmission capability available to Markets+?

• Can Markets+ leverage a flow-based model to maximize available capacity?

• Can we eliminate market hurdle rates for transmission use within the footprint?

• Can we do this while protecting against prohibitive cost shifts and/or free rider issues?
QUESTIONS?
TRANSMISSION AVAILABILITY
CONGESTION RENT ALLOCATION

MICHA BAILEY
SUPERVISOR, CONGESTION HEDGING
CONGESTION RENT ALLOCATION

• Congestion rents are collected in the day-ahead market
  • Price separation between gen and load
• Congestion allocation methodology for Markets+ to be determined by stakeholders including input from:
  • Transmission providers
  • Transmission customers
• Allocation could be based upon:
  • Firm transmission rights
  • Use of transmission in Markets+
• Allows Markets+ participants to hedge against congestion costs
• Would provide additional value to firm transmission customers and support incentives for continued investment
• Lots of work to do, including consideration of internal congestion rent and import/export congestion rent
QUESTIONS?

CONGESTION RENT ALLOCATION
MARKET MONITOR AND OVERSIGHT

BARBARA STROOPE
MANAGER, DAY AHEAD MARKET
FERC REQUIRES OVERSIGHT BY MARKET MONITOR

• FERC Order 719 allows ISO/RTO markets to be overseen by internal, external or hybrid monitor.
  • Three ISOs/RTO have an external monitor
  • Two have an internal monitor
  • One has a hybrid
• Order 719 authorizes RTO board of directors to decide on the monitor structure.
• SPP board has decided an internal form to be most appropriate for SPP’s Integrated Marketplace (RTO).
SPP’S CURRENT MARKET MONITORING APPROACH

• SPP’s internal Market Monitoring Unit (MMU) reports directly to the independent board (Oversight Committee).
• MMU fully independent from SPP executives and staff.
• MMU reviews real-time/historic data and reports any issues to FERC for investigation.
MARKET MONITORING DUTIES

• Ensuring fair, efficient markets
• Obtaining objective information about SPP’s markets and services
• Assessing the behavior of market participants
• Assessing the behavior of other markets and services that impact SPP’s markets
• Detecting structural problems and design flaws and expressing opinions on market design issues
QUESTIONS?
MARKET MONITOR & OVERSIGHT
NEXT STEPS

BRUCE REW
SVP, OPERATIONS
MARKETS+ NEXT STEPS

• Survey will be sent to inform next steps
  • Level of interest
  • Ability to commit staff to effort
  • Hours per week available for effort
  • Topic priority ranking
  • Additional topics

• Virtual meetings
  • Cadence and time commitment based on survey feedback
  • Likely weekly
  • Kickoff in January
2022 IN-PERSON MEETINGS

• **Phoenix**: February 1-2
  • PERA Club, Tempe

• **Portland**: March 29-30
  • TBD

• **Denver**: June 1-2
  • TBD
QUESTIONS?
CONTACT US

If you have any questions about SPP, our Western Services or Markets+ feel free to reach out to us at marketsplus@spp.org and we’ll help you find the right person and the right information!