Our Mission
Helping our members work together to keep the lights on ... today and in the future.
The SPP Difference

- Relationship-based
- Member-driven
- Independence Through Diversity
- Evolutionary vs. Revolutionary
- Reliability and Economics Inseparable
North American Independent System Operators (ISO) and Regional Transmission Organizations (RTO)
SPP’s 94 Members: Independence Through Diversity

- Cooperatives (20)
- Investor-Owned Utilities (16)
- Independent Power Producers/Wholesale Generation (13)
- Power Marketers (12)
- Municipal Systems (14)
- Independent Transmission Companies (10)
- State Agencies (8)
- Federal Agencies (1)

As of Dec. 15, 2015
Contract Services

- Alternative to RTO membership for Transmission Owners
- Oversight of Transmission Owners’ system operations:
  - Reliability Coordination
  - Transmission Planning
  - Tariff Administration
  - Interregional Coordination
- Provides process for assigning cost responsibility for transmission upgrades
What Kind of Markets Does SPP Operate?

- **Transmission Service**: Participants buy and sell use of regional transmission lines that are owned by different parties.

- **Integrated Marketplace**: Participants buy and sell wholesale electricity in day-ahead and real-time.
  - **Day-Ahead Market** commits the most cost-effective and reliable mix of generation for the region.
  - **Real-Time Balancing Market** economically dispatches generation to balance real-time generation and load, while ensuring system reliability.
Finding Balance

Minimum for Reliable Delivery to Customers

Expand Transmission

Customer Energy Cost

More Investment

SPP Today

More Transmission Needed

Less Amount of Transmission

More

Less

Less

More
What is a wholesale energy Market?

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<th>Buyers/Consumers</th>
<th>Locational Prices</th>
<th>Products</th>
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<td>• Utilities</td>
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Day-Ahead Market

- Determines least-cost solution to meet energy bids and reserve requirements
- Participants submit offers and bids to purchase and/or sell energy and operating reserve:
  - Energy
  - Regulation-Up
  - Regulation-Down
  - Spinning Reserve
  - Supplemental Reserve
Real-Time Balancing Market

• Balances real-time load and generation committed by the Day-Ahead Market and Reliability Commitment processes

• Operates on continuous 5-minute basis
  • Calculates dispatch instructions for energy and clears operating reserve by resource

• Energy and operating reserve are co-optimized

• Settlements based on difference between results of RTBM process and Day-Ahead Market clearing

• Charges imposed on market participants for failure to deploy energy and operating reserve as instructed
Transmission Congestion Rights (TCR) Market

• In DA Market, price separation of MP’s resource to load may occur due to congestion leaving the MP exposed to high prices

• A TCR can be used as hedge against congestion that allows MPs to reduce their exposure to high market prices and potentially receive lower priced deliverable energy

• TCR Market has Annual and Monthly Auction processes related to two products:
  • Auction Revenue Rights (ARRs)
  • Transmission Congestion Rights (TCRs)
Marketplace Over Last 12 Months

• 172 Market Participants
  • 110 financial only and 62 asset owning
  • Added 6 new Market Participants since January report

• SPP BA has successfully maintained NERC control performance standards (BAAL & CPS)

• High System availability
  • Day-Ahead Market was only delayed from posting once in the first quarter of 2016
  • Real-Time Balancing Market has successfully solved 99.90% of all intervals
Integrated Marketplace Savings

• Market continues to provide savings even with extremely low natural gas prices below $2

• First year net savings calculated to be $380 million

• 2015 annual net savings calculated to be $422 million
Real-Time versus DA pricing
% Contribution of LMP Difference

MCC: Marginal Congestion Cost
MLC: Marginal Loss Cost
MEC: Marginal Energy Cost
Marketplace Operational Highlights

• 2015/2016 Winter Peak of 37,412 MW on January 18, 2016

• 2016 Summer peak of 48,323 MW on June 22, 2016

• Total of 12,972 MW of installed and operational wind capacity to date

• Additional 140 MW of solar plants registered on 4/1/2016
Wind Output: January – March 2016

- Wind output represents the total real-time output of all wind generators in the SPP market at a point in time.

- Max wind output: 10,989 MW 4/23
- Min wind output: 264 MW 1/12
  - All-Time Min*: 30 MW 3/1/2015

- Q1 Average wind output: 5,422 MW

- Wind penetration represents the instantaneous wind output divided by the total load. (Wind Gen/SPP Load)

- Max % penetration: 49.17% of load 4/24
- Min % penetration: 0.8% of load 1/12
  - All-time Min*: 0.1% of load 3/1/2015

- Q1 Average % penetration: 20.0% of load

*Since Integrated Marketplace Go-Live 3/1/2014
January – March 2016

Daily Averages

- **Average of Wind Output MW**
- **Average of Wind Penetration**

Wind MW

- 0
- 1000
- 2000
- 3000
- 4000
- 5000
- 6000
- 7000
- 8000
- 9000
- 10000

Wind Penetration

- 0%
- 5%
- 10%
- 15%
- 20%
- 25%
- 30%
- 35%
- 40%
- 45%
- 50%
- 55%
Integrated Marketplace Enhancements

- Recently Implemented:
  - Real-Time Data Precision Enhancement
  - Short-Term Intra-Day RUC (STRUC)
  - Misc Markets UI/API Improvements

- On The Way (June 1, 2016 Implementation):
  - ECC Changes/Schema Changes
  - MCE Performance Enhancements (in preparation of ECC)
  - Misc MP Requested Enhancements

- Tentative Near Term: (Target Nov 1, 2016 Implementation)
  - ECC Changes as needed
  - Misc Markets UI/API Improvements
Other Initiatives

• Expansion development
  • Mountain West

• Seams
  • Interface Pricing
    • Calculation of Prices
    • Multiple prices along a seam
  • Market-to-Market

• Coordination of Market Design across RTOs

• Responding to FERC proposed rulemaking
  • Offer Cap
  • Price Formation
  • Market Efficiency