SPP RTO Update

C. Richard Ross
Director, RTO Policy West
SPP RTO
Core SPP Services – Transmission Planning, Energy Markets, Reliability Coordination

THE VALUE OF SPP

- Transmission planning, market administration, reliability coordination, and other services provide net benefits to SPP’s members in excess of more than $1.7 billion annually at a benefit-to-cost ratio of 11-to-1.

- A typical residential customer using 1,000 kWh saves $6.02/month because of the services SPP provides.
SPP Governance

- Regional State Committee
- SPP Board
- Members

SPP
Transmission Grid Expansion

Projects Constructed or with NTCs (2005 - 2017)

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Value of Transmission

• Enables the Integrated Energy Markets
• 2015 SPP study of $3.4B in transmission investment from 2012-2014 is expected to exceed $16.6B in benefits over 40 years with $240 Million in fuel cost savings in the first year of the Integrated Market
• Facilitates the delivery of wind energy to major load centers including Tulsa and Oklahoma City
• Regional Transmission Planning enables more efficient transmission planning
PSO Benefit in the SPP Integrated Market

- SPP IM Established in 2014
- Estimated $2.7B in savings across SPP
- PSO net buyer from the Integrated market in 2018 of 3,000,000 MWH or 54% of PSO load
2018 U.S. Energy Spot Prices

2018 Spot Power Prices ($/MWh)

- Mid-Columbia: $34, 32%
- Indiana Hub: $38, 8.5%
- NP 15: $40, 4%
- Palo Verde: $40, 18.1%
- SPP North: $29, 15.5%
- PJM West: $42, 26.2%
- NYISO ZJ: $46, 23.2%
- Mass Hub: $48, 38.9%
- ERCOT North: $42, 56%
- Into Southern: $31, 3%

$ = Average YTD 2018 monthly day-ahead on-peak price
% = Percent increase from 2017 YTD
Source: RTO/ISO data and SNL Day-ahead Prices
FINDING BALANCE

Minimum for Reliable Delivery to Customers

SPP Today

More Transmission Needed

Expand Transmission

Customer Energy Cost

Balance

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LMP Prices 2007-2017

AVERAGE REAL-TIME MARKET PRICES: 2007-2017

- 2007
- 2008
- 2009
- 2010
- 2011
- 2012
- 2013
- 2014
- 2015
- 2016
- 2017

Average Price
- $65
- $15

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SPP LMP energy prices

2017 Day Ahead Market Prices

2018 Day Ahead Market Prices
Regional Cost Allocation Review

Estimated 40-year Present Value of Benefit Metrics and Costs (2016 Smillion)

<table>
<thead>
<tr>
<th>Benefit Metrics</th>
<th>Before Additional Revenue Offset</th>
<th>MISO Revenue Offset</th>
<th>Revenue Offset</th>
<th>Benefit/Cost Ratio</th>
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<td>Present Value of 40-yr Benefits for the 2015-2054 Period (2016 $million)</td>
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Table: Estimated 40-year Present Value of Benefit Metrics and Costs (2016 Smillion)
The Future SPP

- Focus on Transmission Optimization
  - Temperature Adjusted Ratings
- Renewables (wind, solar, storage) continue to grow and dominate the Generator Interconnection queue
- Reliably Integrate those renewables to allow PSO customers to benefit from low cost energy
- Market Enhancements
- Holistic Integrated Tariff Team (HITT)
- Manage RTO expenses
  - Schedule 1A taskforce
  - Value and Affordability Taskforce
  - Transmission Project Cost Tracking
Wind Speeds across the US

ANNUAL AVERAGE WIND SPEEDS

US Renewable Areas

Renewable Harvesting Opportunities
SPP Organizational Groups

Group Organizational Chart

- Regional State Committee
  - President: Kim O’Quinn
  - Secy: Paul Suskie

- Cost Allocation Working Group
  - Chair: Cindy Ireland
  - Secy: Lee Elliott

- Oversight Committee
  - Chair: Joshua Martin
  - Secy: Michael Desselle

- Corporate Governance Committee
  - Chair: Nick Brown
  - Secy: Paul Suskie

- Finance Committee
  - Chair: Bruce Scherr
  - Secy: Tim Dunn

- SPP Staff
  - President: Nick Brown
  - Exec VP: Carl Monroe
  - Exec VP: Paul Suskie
  - Senior VP: Tom Dunn
  - Senior VP: Mike Ross
  - VP: Michael Desselle, Lanny Nickell, Bruce Rew, Malinda See, Barbara Sugg

- SPP Board of Directors/Members Committee
  - Chair: Larry Allenbauer
  - Vice Chair: Graham Edwards
  - Secy: Paul Suskie

- Market and Operations Policy Committee
  - Chair: Holly Carlas
  - Vice Chair: Denise Buffington
  - Secy: Lanny Nickell

- Business Practices WG
  - Chair: Grant Wilkens
  - Vice Chair: Kass Porta
  - Secy: Kim Quinby

- Change WG
  - Chair: Carrie Dixon
  - Vice Chair: Jodi Hall
  - Secy: Terry Rhodes

- Economic Studies WG
  - Chair: Alan Myers
  - Vice Chair: Tim O’Hea
  - Secy: Amber Greb

- Operations Training WG
  - Chair: Russell Moore
  - Vice Chair: Michael Gaunder
  - Secy: Michael Daly

- Project Cost WG
  - Chair: Tom Hestermann
  - Vice Chair: Brian Johnson
  - Secy: John O’Dell

- Reliability Compliance WG
  - Chair: Jennifer Flandermeyer
  - Vice Chair: John Allen
  - Secy: Jonathan Hayes

- Regional Tariff WG
  - Chair: David Kays
  - Vice Chair: Robert Pick
  - Secy: Marina Chaote

- Seams Steering Committee
  - Chair: Jim Jabokey
  - Vice Chair: Barry Warren
  - Secy: Clint Savoy

- Security WG
  - Chair: Eric Ervin
  - Vice Chair: Phil Clark
  - Secy: Michael Good

- Supply Advocacy WG
  - Chair: Bradley Hare
  - Vice Chair: Natasha Henderson
  - Secy: Chris Halsey

- System Protection & Control WG
  - Chair: Stephen Wodas
  - Vice Chair: Mathew Thylkundathil
  - Secy: Doug Boerman

- Transmission WG
  - Chair: Travis Hyde
  - Vice Chair: Nathan McNeil
  - Secy: Aaron Stewart

- Model Development WG
  - Chair: Kent Moren
  - Vice Chair: Derek Brown
  - Secy: Sunny Rafaee

Updated 3/13/19

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