SPP OVERVIEW

Mike Ross
Senior Vice President,
Government Affairs and Public Relations
Our Mission
Helping our members work together to keep the lights on ... today and in the future.
NORTH AMERICAN INDEPENDENT SYSTEM OPERATORS (ISO) AND REGIONAL TRANSMISSION ORGANIZATIONS (RTO)
The SPP Footprint: Members in 14 States

- Arkansas
- Kansas
- Iowa
- Louisiana
- Minnesota
- Missouri
- Montana
- Nebraska
- New Mexico
- North Dakota
- Oklahoma
- South Dakota
- Texas
- Wyoming
SPP’S 95 MEMBERS: INDEPENDENCE THROUGH DIVERSITY

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

As of April 12, 2017
Our Major Services

- Reliability Coordination
- Market Operation
- Transmission Planning
- Transmission Service/Tariff Administration
- Balancing Authority
- Facilitation
- Standards Setting
- Compliance Enforcement
- Training

OUR APPROACH:
Regional, Independent, Cost-Effective and Focused on Reliability
Some Activities Outside of SPP’s Responsibility

- Transmission Siting
- Generation Planning/Siting
- Transmission/Generation Construction
- Transmission/Generation Permitting
2016 ENERGY CONSUMPTION BY FUEL TYPE (266,442 GWH TOTAL)

- Gas (22.36%)
- Coal (47.48%)
- Hydro (5.84%)
- Wind (17.07%)
- Nuclear (6.83%)
- Other (0.41%)
SPP OPERATING REGION

- Miles of service territory: 546,000
- Population served: 17.5M
- Generating Resources: 726
- Substations: 4,835
- Miles of transmission: 65,755
  - 69 kV 16,808
  - 115 kV 15,512
  - 138 kV 9,471
  - 161 kV 5,596
  - 230 kV 7,518
  - 345 kV 10,758
  - 500kV 92
Transmission Planning

• Reliability
• Economics
• Public Policy
WHAT IS CONGESTION?

• Congestion or “bottlenecks” happen when you can’t get energy to customers along a certain path
  • Desired electricity flows exceed physical capability

• Congestion caused by:
  • Lack of transmission, often due to load growth
  • Line and generator maintenance outages
  • Unplanned outages such as storms or trees on lines
  • Too much generation pushed to grid in a particular location
  • Preferred energy source located far from customers

• Results in inability to use least-cost electricity to meet demand
CONGESTION PREVENTS ACCESS TO GENERATION

Load pockets see higher prices (pay for more expensive, local generation)

Low prices in areas with high amount of cheap generation (wind), constrained by transmission outlets
The highest wind speed in the country is within SPP Balancing Authority.
WIND ENERGY DEVELOPMENT

- SPP’s “Saudi Arabia” of wind: Kansas, Oklahoma, Nebraska, Texas Panhandle, and New Mexico
  - 60,000-90,000 MW potential
  - More wind energy than SPP uses during peak demand
- 17,885 MW capacity installed wind on SPP transmission
- 43,839 MW wind in all stages of development
  - Includes 36,790 MW in the Generation Interconnection queue and 7,049 MW of executed Interconnection Agreements
WIND CAPACITY HAS GROWN SIGNIFICANTLY
PEONDING GI REQUESTS BY GENERATOR TYPE

MW Requested by Generation Type

August 16, 2017
Integrated Transmission Planning (ITP)

- Develop EHV “highway” vision
- Develop “highway/byway” system
- Develop “byway” & “local” system

- Reliability, economic and public policy needs are evaluated in the 20 and 10-year assessments
- Reliability needs are evaluated in the near-term assessment
Transmission Build Cycle in SPP

- **Planning Study (12-18 mo.)**
- **TO Selection (3-12 mo.)**
- **Design, ROW Acquisition, & Construction (2-6 yr.)**

**Responsible Party**
- **SPP**
- **Transmission Owner**
WHO PAYS FOR TRANSMISSION PROJECTS?

- **Sponsored**: Project owner builds and receives credit for use of transmission lines

- **Directly-assigned**: Project owner builds and is responsible for cost recovery and receives credit for use of transmission lines

- **Highway/Byway**: Most SPP projects paid for under this methodology

<table>
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<tr>
<th>Voltage</th>
<th>Region Pays</th>
<th>Local Zone Pays</th>
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<tbody>
<tr>
<td>300 kV and above</td>
<td>100%</td>
<td>0%</td>
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<tr>
<td>Above 100 kV and below</td>
<td>33%</td>
<td>67%</td>
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<tr>
<td>300 kV</td>
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<tr>
<td>100 kV and below</td>
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Transmission Investment Directed By SPP

Annual Transmission Investment Directed By SPP

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<tr>
<th>Year</th>
<th>Completed ($B)</th>
<th>Scheduled ($B)</th>
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<tbody>
<tr>
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<td>$59</td>
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<tr>
<td>2022</td>
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<tr>
<td>2006</td>
<td>$60</td>
<td>$14</td>
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</table>

$Million

$0  $200  $400  $600  $800  $1,000  $1,200  $1,400  $1,600  $1,800

MODERNIZING THE GRID
THE VALUE OF TRANSMISSION

www.SPP.org/value-of-transmission
SPP’s Value of Transmission Study

• Evaluated 348 projects from 2012-14, representing $3.4B of transmission investment

• Evaluated benefit metrics
  • Adjusted Production Cost (APC) Savings
  • Reliability and Resource Adequacy Benefits
  • Generation Capacity Cost Savings
  • Market Benefits
  • Other industry and SPP-accepted metrics

• APC Savings alone calculated at more than $660k/day, or $240M/year.

• Overall NPV of all benefits for considered projects are expected to exceed $16.6B over 40 years.

For every $1 of transmission investment made in 2012-2014, SPP expects at least $3.50 of benefit to be provided to rate-payers
HELPING OUR MEMBERS WORK TOGETHER TO KEEP THE LIGHTS ON... TODAY AND IN THE FUTURE.