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SPP RTO Update

C. Richard Ross

Director, RTO Policy West

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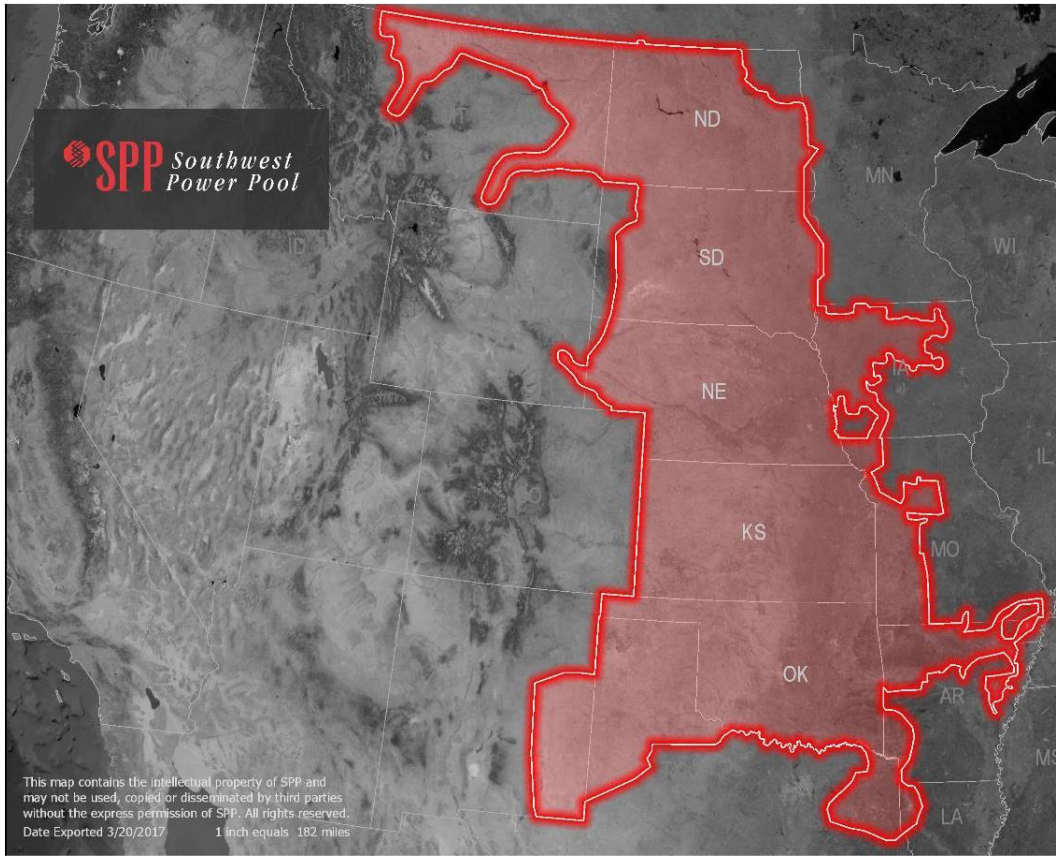

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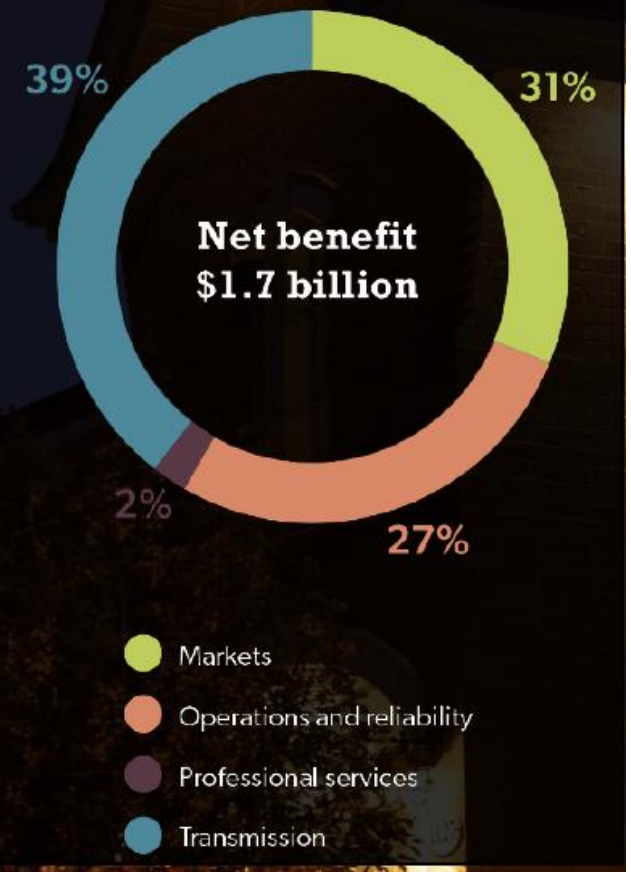
Core SPP Services – Transmission Planning, Energy Markets, Reliability Coordination

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.



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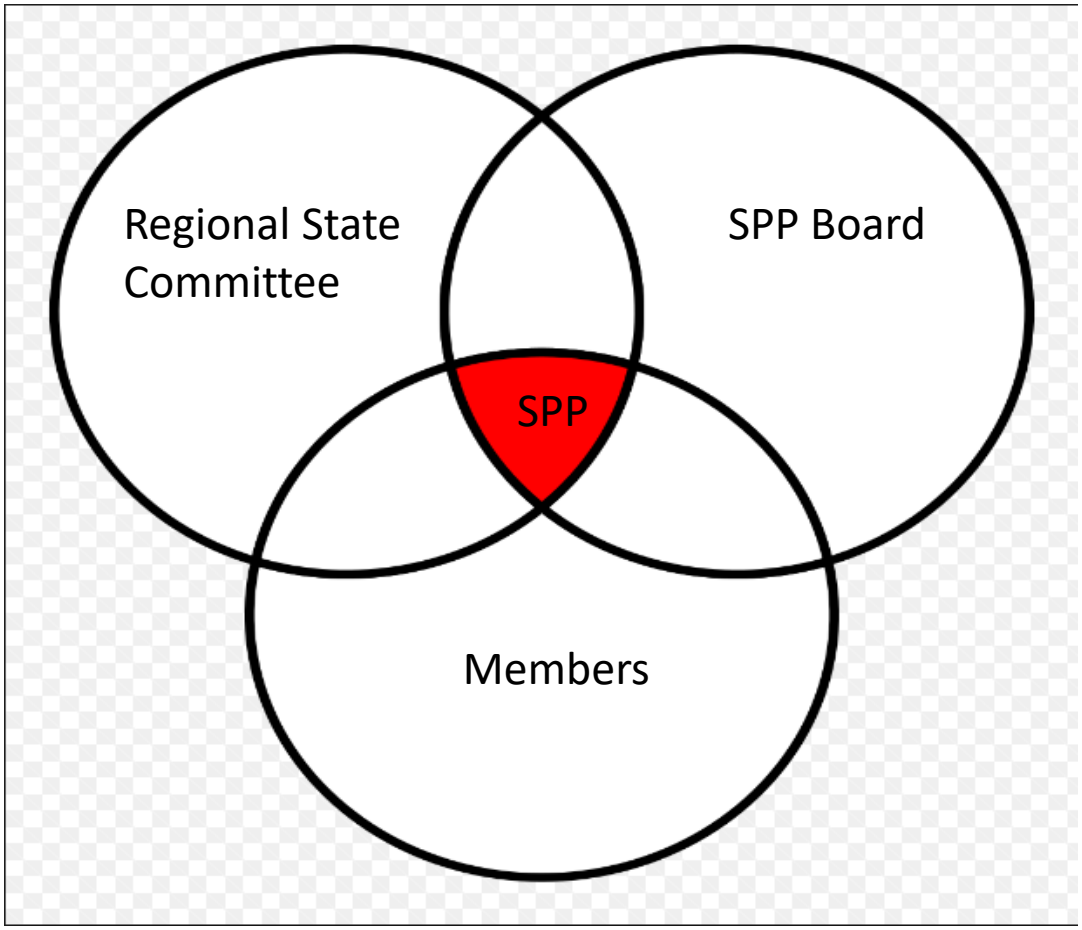
SPP Governance



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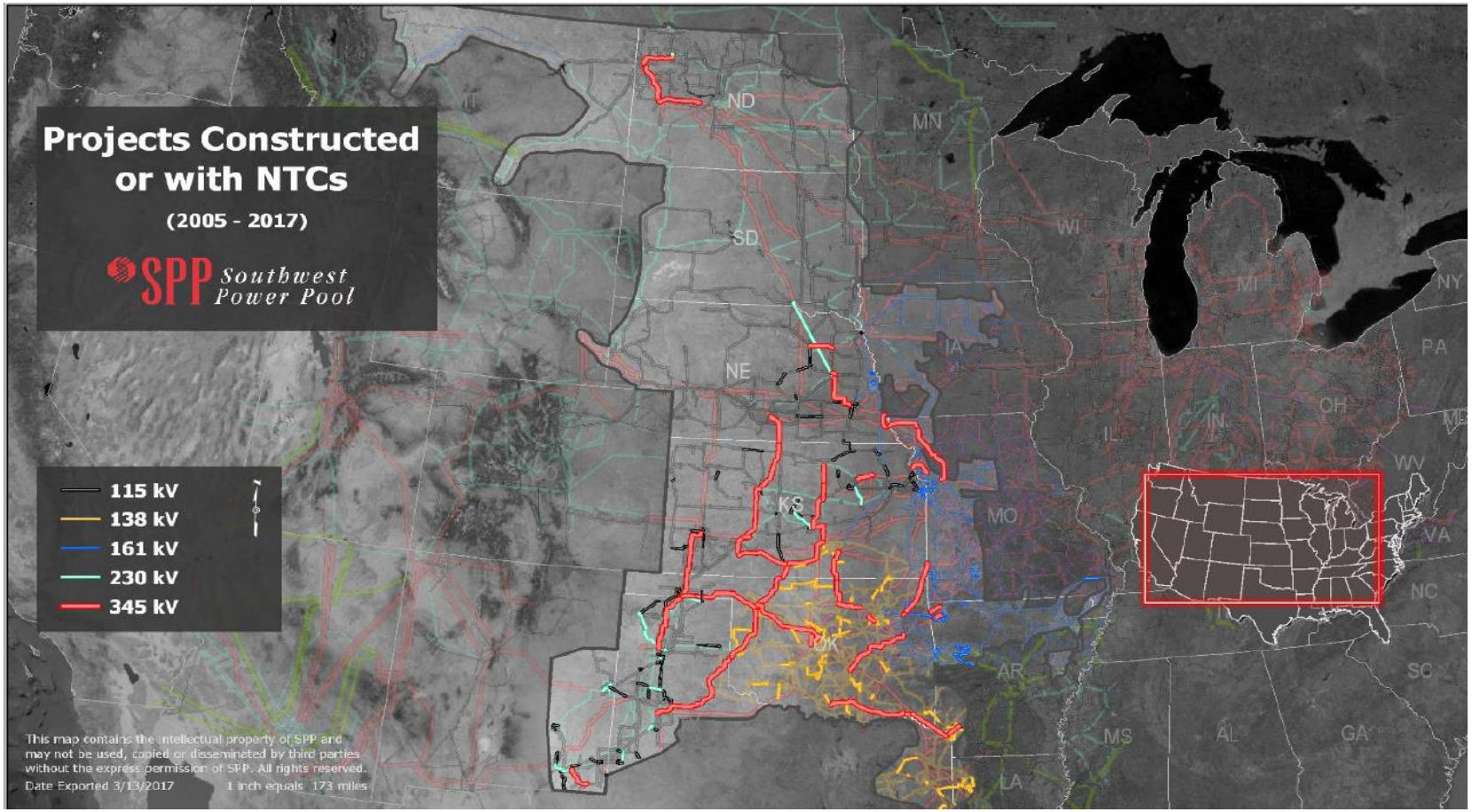
Transmission Grid Expansion



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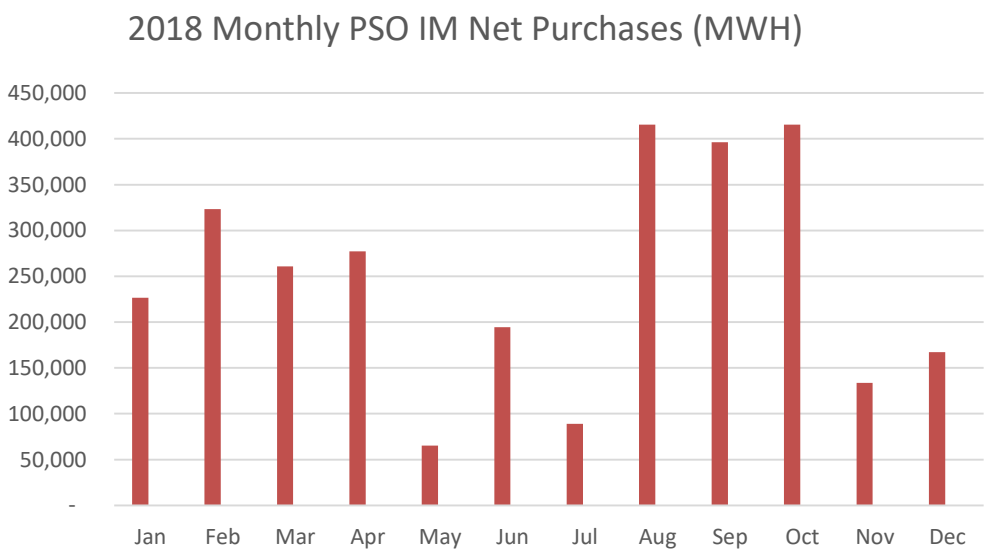
Value of Transmission

- 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



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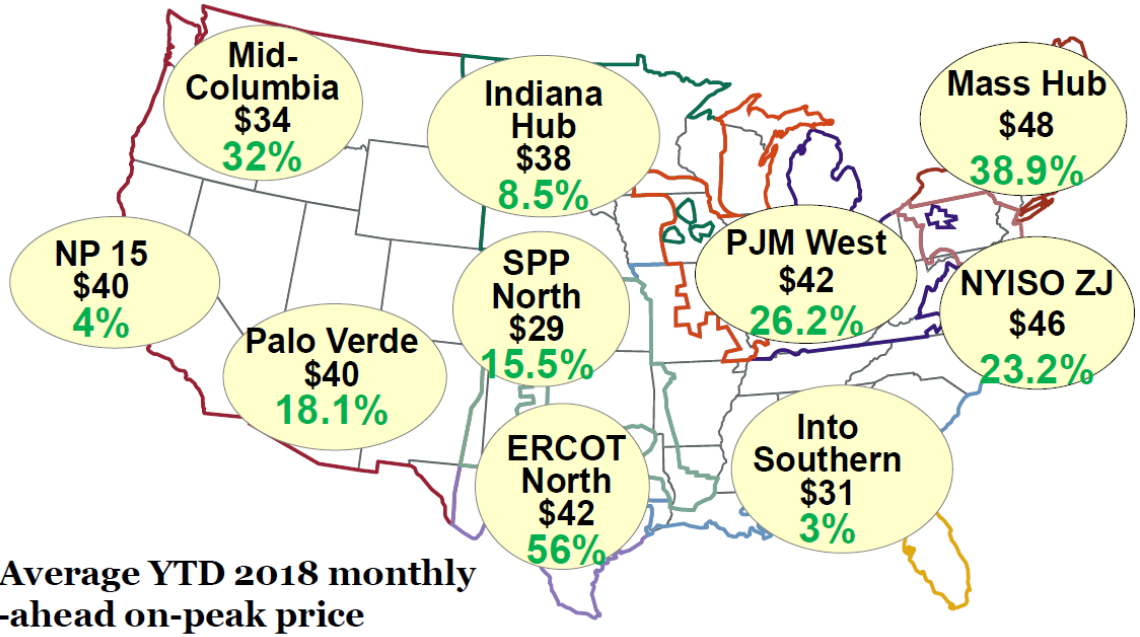
2018 U.S. Energy Spot Prices

Federal Energy Regulatory Commission • Market Oversight • www.ferc.gov/oversight

2018 Spot Power Prices ($/MWh)



$ = Average YTD 2018 monthly day-ahead on-peak price

% = Percent increase from 2017 YTD

Source: RTO/ISO data and SNL Day-ahead Prices

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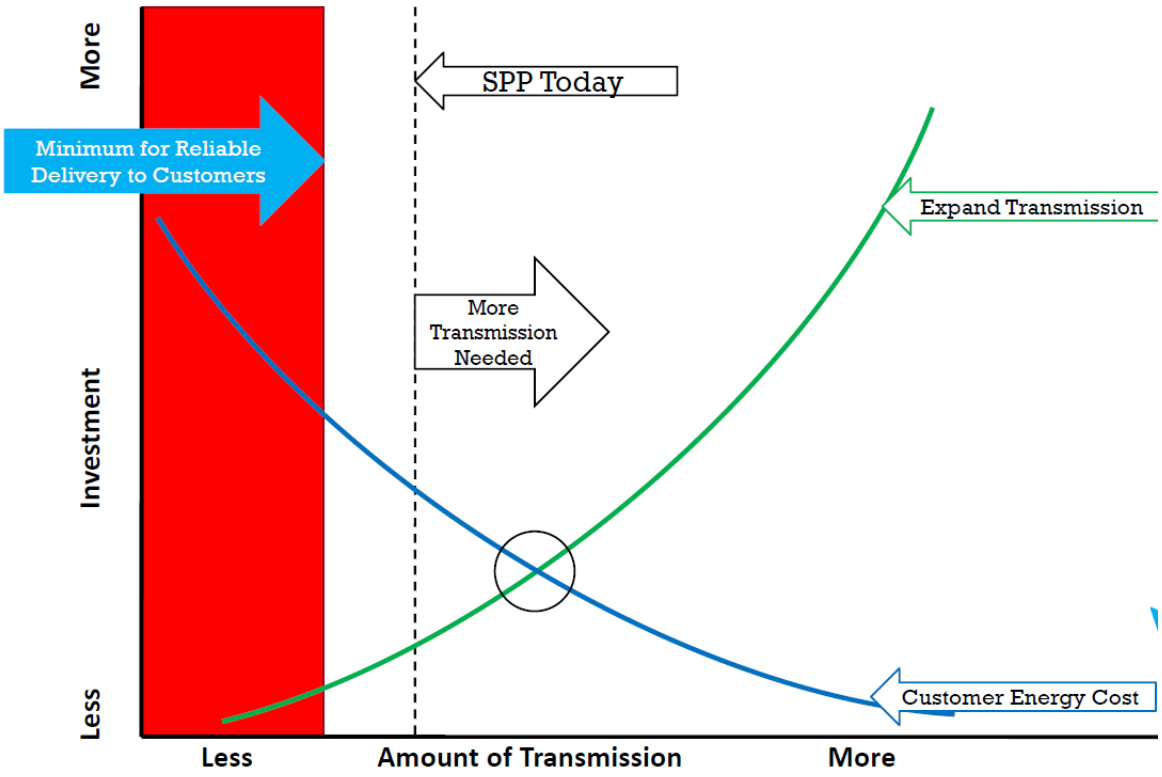
Balance

FINDING BALANCE



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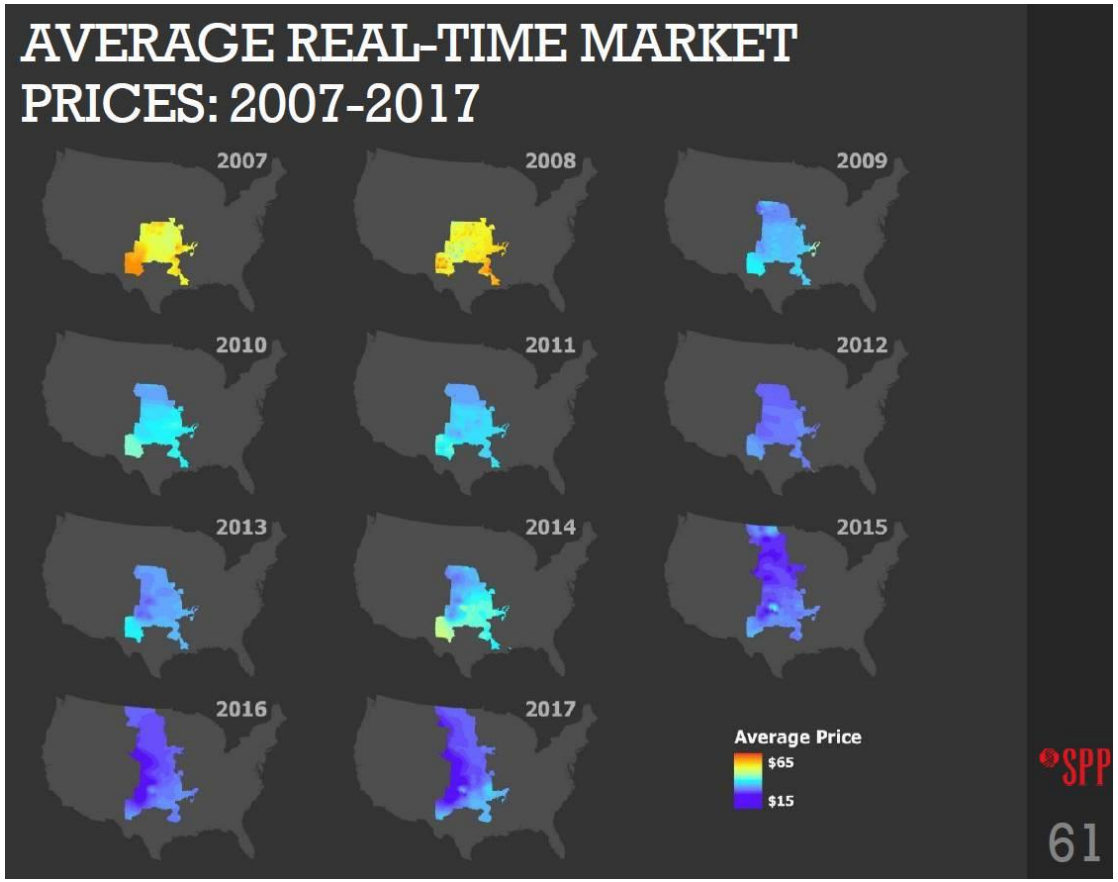
LMP Prices 2007-2017



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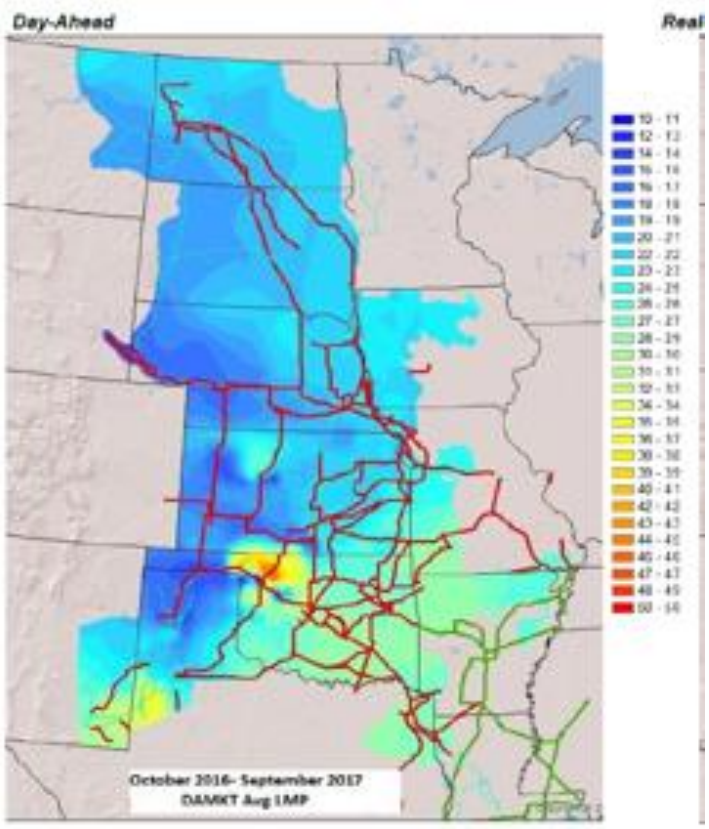
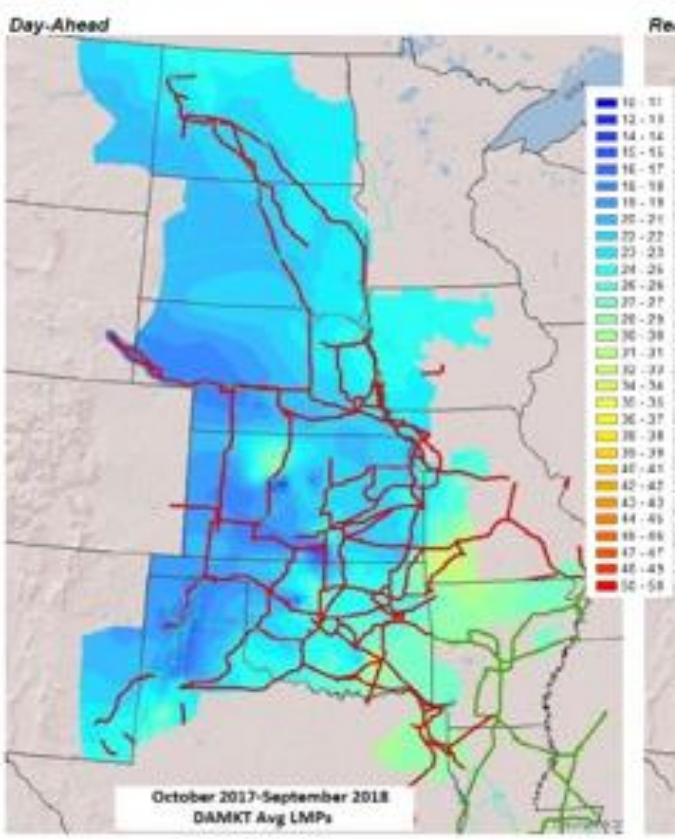
SPP LMP energy prices

2017 Day Ahead Market Prices



2018 Day Ahead Market Prices



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Regional Cost Allocation Review

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

	Present Value of 40-yr Benefits for the 2015-2054 Period (2016 $million)												PV of 40-yr ATRRs (2016 $million)			
	APC Savings	Avoided or Delayed Reliability Projects	Capacity Savings from Reduced On-Peak Losses	Mitigation of Trans-mission Outage Costs	Assumed Benefit of Mandated Reliability Projects	Benefit from Meeting Public Policy Goals	Increased Wheeling Through and Out Revenues	Marginal Energy Losses Benefits	Reduced Cost of Extreme Events	Reduced Loss of Load Probability	Capital Savings from Reduced Minimum Required Margin	Total Benefits	Before PtP and MISO Revenue Offset	PtP and MISO Revenue Offset	After PtP and MISO Revenue Offset	Benefit/ Cost Ratio
AEP	$1,216	$20	$87	$207	$965	$0	$133	$59				$2,686	$1,654	$121	$1,533	1.75
CUS	-$33	$0	$0	$14	$53	$0	$5	$2				$42	$76	$5	$71	0.59
EDE	-$25	$0	$0	$24	$83	$0	$12	$0				$95	$126	$9	$117	0.81
GMO	$174	$1	$3	$38	$180	$0	$19	-$2				$412	$207	$15	$192	2.15
GRDA	$82	$0	$1	$19	$70	$0	$13	-$6				$179	$114	$8	$106	1.68
KCPL	$642	$1	$6	$76	$308	$0	$37	$51				$1,122	$407	$29	$378	2.97
LES	$115	$0	$1	$19	$64	$0	$8	$15				$223	$106	$8	$98	2.27
MIDW	$76	$0	$11	$8	$93	$0	$5	-$3				$190	$71	$5	$66	2.89
MKEC	$60	$0	$17	$13	$171	$0	$14	$30		Not Monetized		$306	$259	$20	$239	1.28
NPPD	$158	$1	$53	$58	$275	$0	$38	-$9				$574	$404	$29	$375	1.53
OGE	$1,428	$2	$65	$131	$635	$0	$66	-$64				$2,262	$838	$60	$777	2.91
OPPD	$24	$1	$3	$48	$150	$0	$23	$9				$257	$320	$23	$297	0.87
SEPC	$83	$0	$12	$9	$159	$0	$8	$11				$283	$82	$6	$76	3.73
SPS	$3,537	$12	$357	$115	$1,024	$0	$90	-$13				$5,122	$1,402	$102	$1,301	3.94
UMZ	$281	$1	$47	$96	$595	$0	$55	$191				$1,266	$397	$45	$352	3.60
WFEC	$159	$0	$77	$34	$222	$0	$20	$56				$568	$295	$21	$274	2.08
WR	$996	$1	$5	$105	$710	$0	$94	$100				$2,011	$1,002	$73	$930	2.16
TOTAL	$8,974	$41	$743	$1,014	$5,759	$0	$641	$427				$17,599	$7,760	$579	$7,180	2.45

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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

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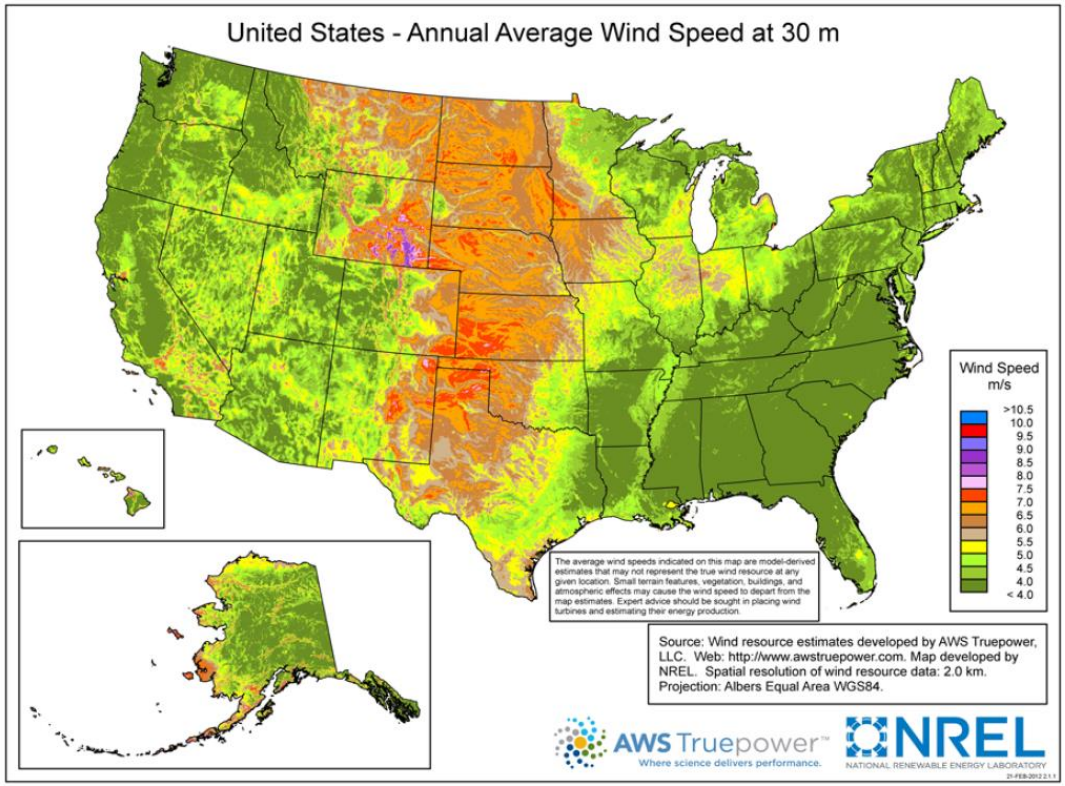
Wind Speeds across the US

ANNUAL AVERAGE WIND SPEEDS



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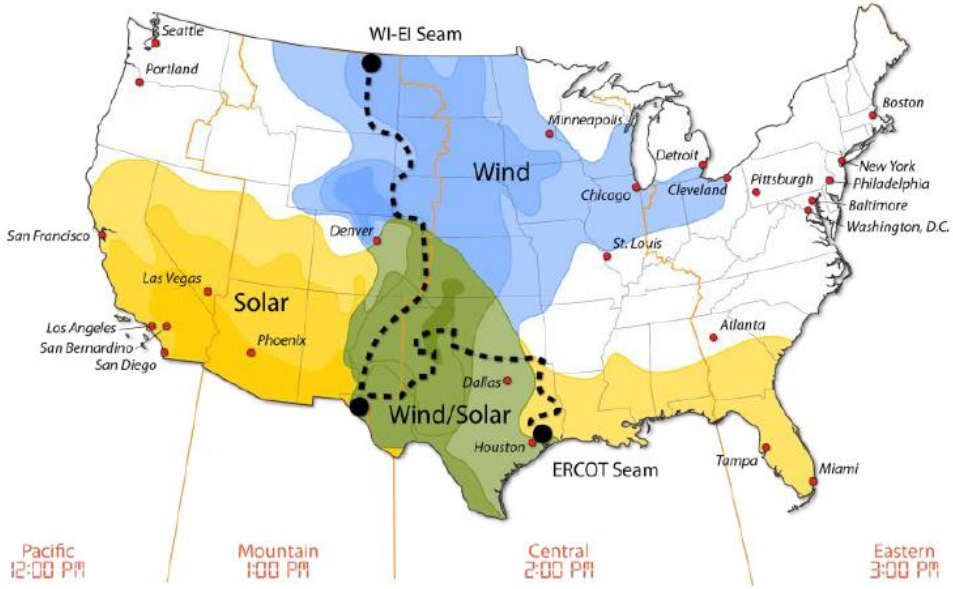
US Renewable Areas

Renewable Harvesting Opportunities



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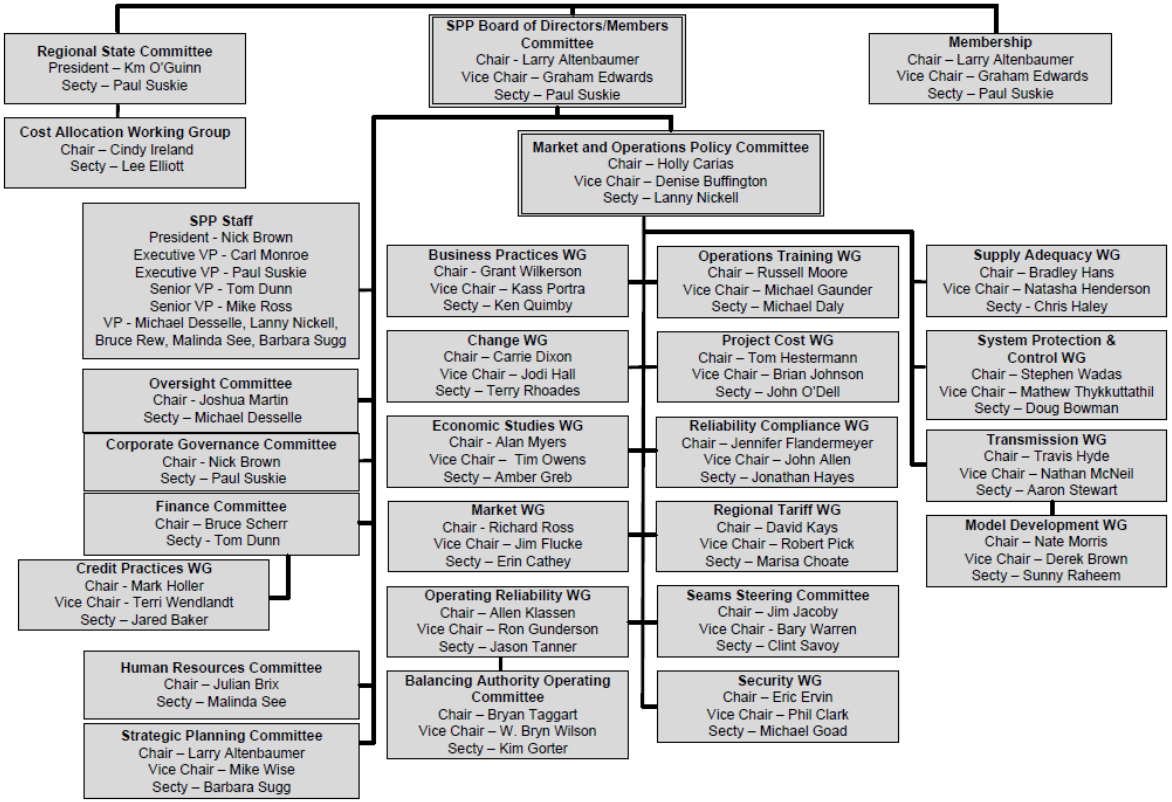
SPP Organizational Groups

SPP Southwest Power Pool

Group Organizational Chart



Updated 3/13/19