



**BASIN ELECTRIC
POWER COOPERATIVE**

A Touchstone Energy® Cooperative 

Marketing & Asset Management January MAC 2018

Ken Rutter

End of December



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A Tractone Energy[®] Cooperative 

Recent Events

- With the recent spike in natural gas and energy prices does this change staff's perception of increasing exposure to the market?
- How did the economics of our position look for December?
- Did the value of the energy “insurance” we have in place change much?

What Happened/How Did we Manage?

1. Cold weather moved in...

- Loads increased
- Optimized WAPA Peaking and CoSupply Allocations

2. Constraints on Northern Border Pipeline...

- Gas prices spiked
- Purchased \$68/mmbtu natural gas for units on the north end of the system. SPP will make these reliability runs whole.

3. Northern Border orders Operational Flow Order and Force Majeure...

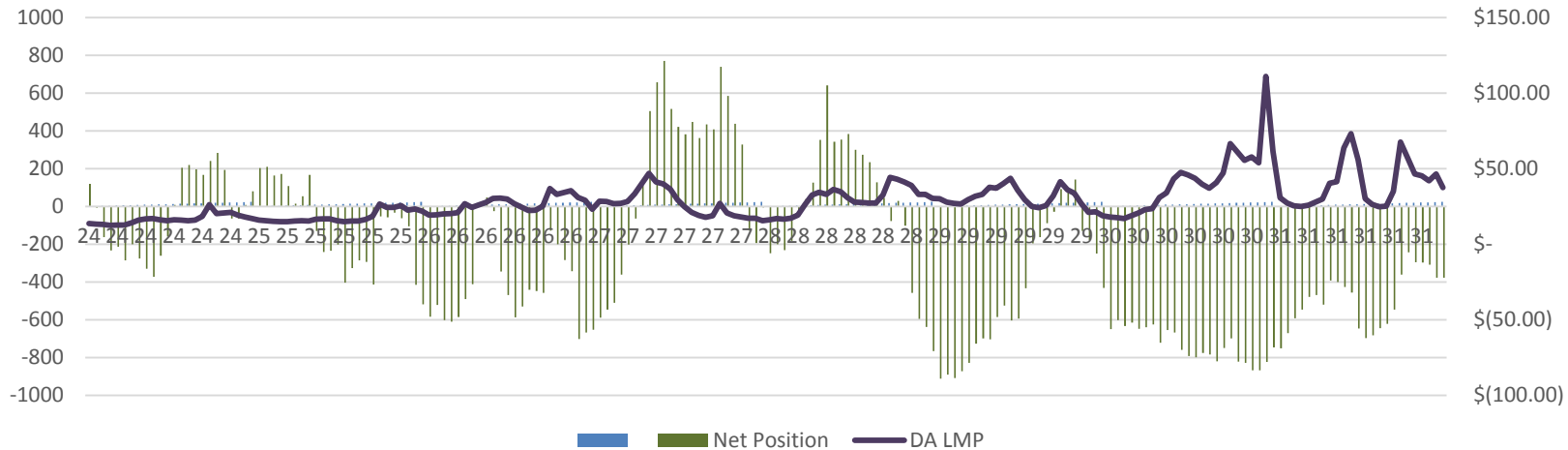
- Unable to run natural gas units at the south end of the system
- Groton/Culbertson/Deer Creek experience difficulties in start ups
- Position is short and we are buying power from the market
- Optimized tie transfers from the West

4. Meanwhile in the Market ...

- SPP Day Ahead prices average \$93 for the day
- Serving Montana load with west side purchase
- Market wind averages approx. 6,000 MW/hr

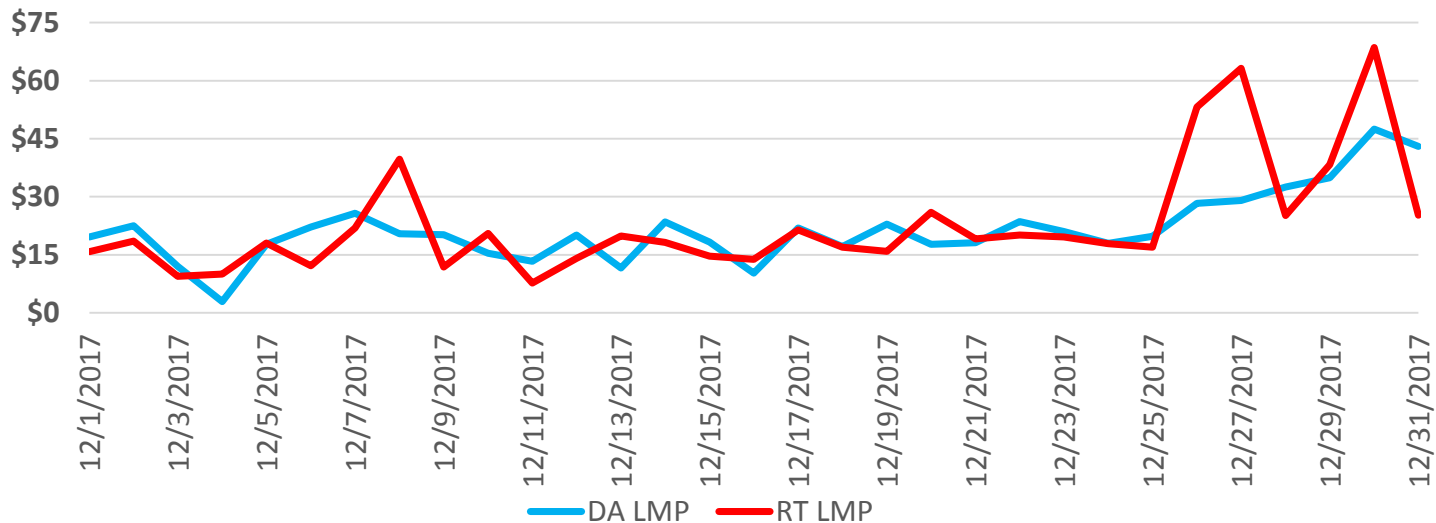
December 24th - December 31st

Hourly Position vs Day Ahead Price



While leaving some exposure to the market allows for opportunity, there is also risk associated with market exposure. We had 4 days at the end of December where average day ahead prices spiked and we were short and purchased power from the market at an average price of \$37.82 to serve our load.

December Day Ahead & Real Time Load Zone Average Daily Pricing



December Day-Ahead Average	\$21.63
December Real-Time Average	\$23.02

Pricing represented is average around the clock market pricing and is not always representative of actual transacted prices.

December Market Opportunity

	MWH's	Market Opportunity
Total Load	1,749,000	
Total Generation	1,647,000	
Net Position	(102,000)	5.87% Market Opportunity
Net MWh's when Short	175,000 MWh's	\$20.03 Avg Purchase Price
Net MWh's when Long	72,000 MWh's	

Our average PPA price is \$30.00/MWh. This “hedged” price is \$10 over current market values. This is the “insurance” we pay in order to attempt to hedge 100% of our energy load in advance. In December, we had long term hedges of 700,000 MWh's of power. We recognize that current forward market prices are much lower than \$30/MWh.

How Much Insurance Do We Need?

December Opportunity Cost of all PPA's	2017 Opportunity Cost of all PPA's	2017 Average Market Price for PPA Volumes	2017 Average Contract Price for PPA
(\$7.2mm)	(\$104mm)	\$17.50	(\$33.00)

Look Back What If Monthly

Net Open Position	Market Opportunity	Mark to Market Cost	Total
5.87%	\$ 1,739,715	\$ (7,198,408)	\$ (5,458,693)
7%	\$ 1,909,796	\$ (6,958,135)	\$ (5,048,339)
10%	\$ 2,386,991	\$ (6,340,295)	\$ (3,953,304)
15%	\$ 3,329,886	\$ (5,293,404)	\$ (1,963,518)

Again, we must recognize that current forward market prices are much lower than \$30/MWh.

In Total ... December

- The cold weather was **very financially supportive** to member energy loads and member demand.
- Market related impacts due to high prices were a **neutral event**, however opportunity was lost due to operational issues and high Ventura natural gas prices.
- **Overall = positive event for Basin Electric.**

Plant P&L's

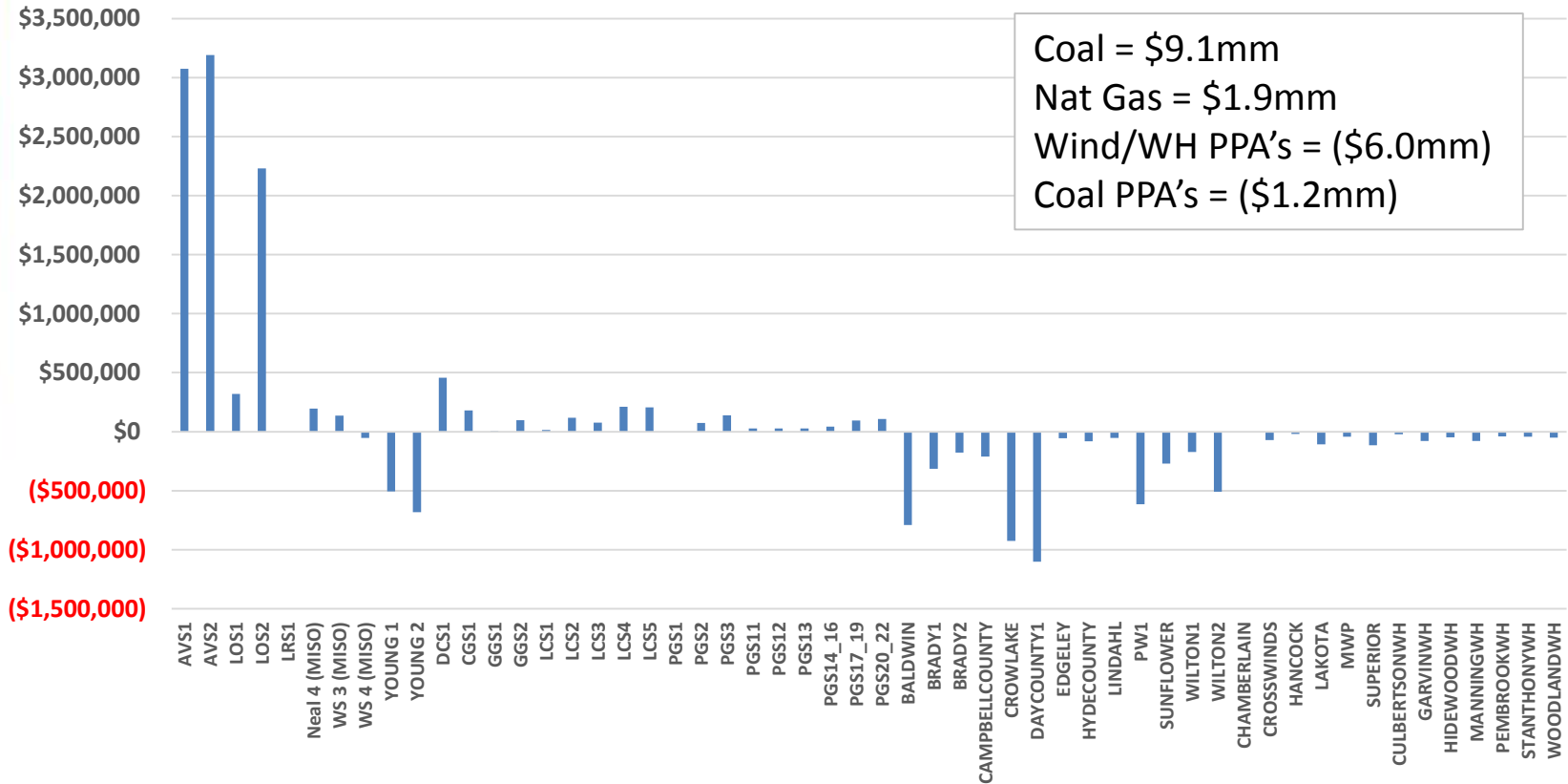


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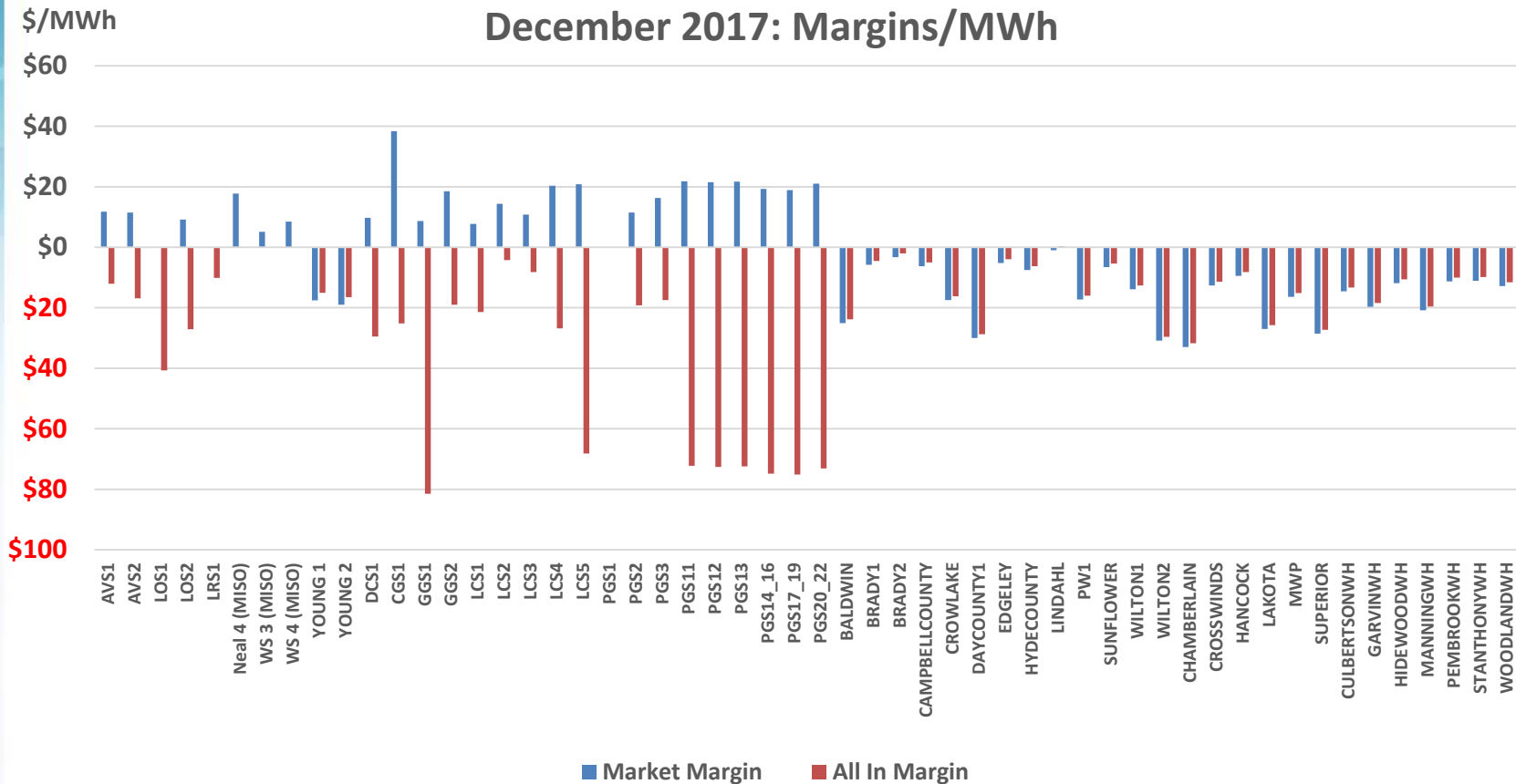
Market P&L Measurement

- Incremental: Market Revenue - Fuel and SPP allowable VOM
- Short-Term: Market Revenue - All Variable + Capacity Value
- All-in: Market Revenue - All Fixed & Variable Costs

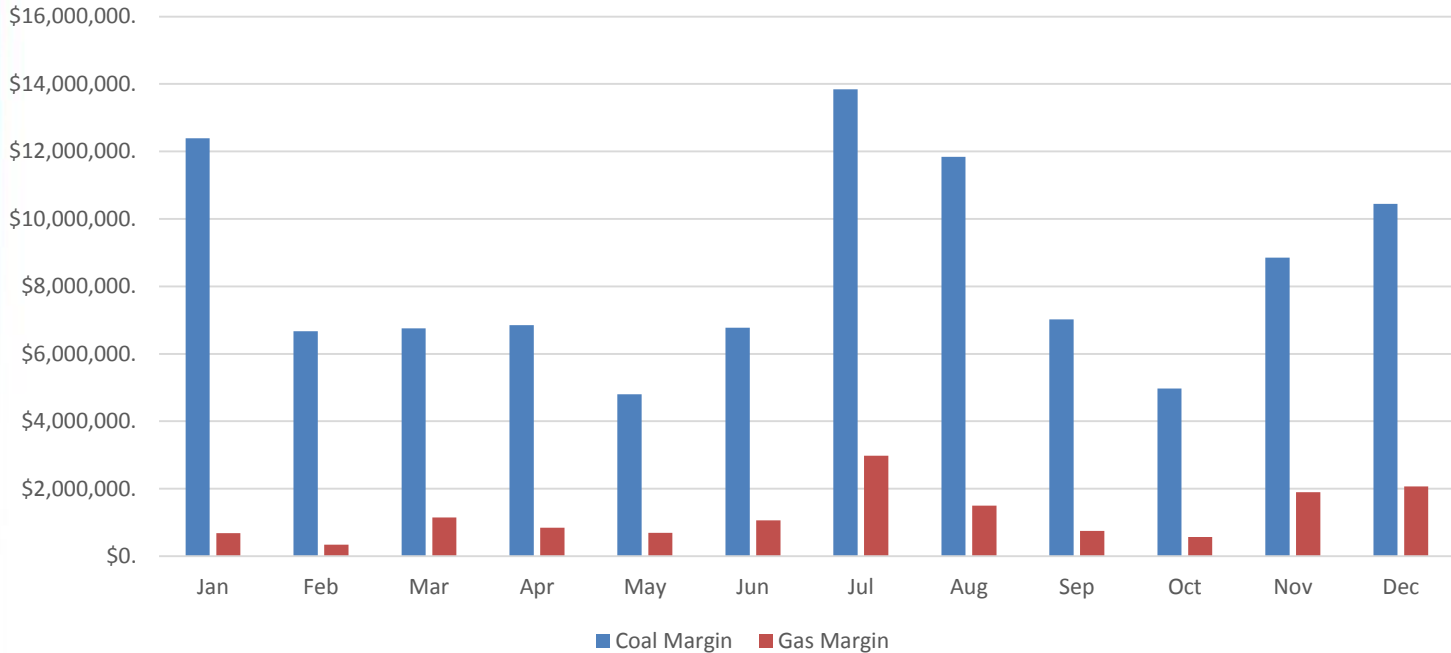
December Total Incremental Market Margins



December Incremental Market and All In Margins



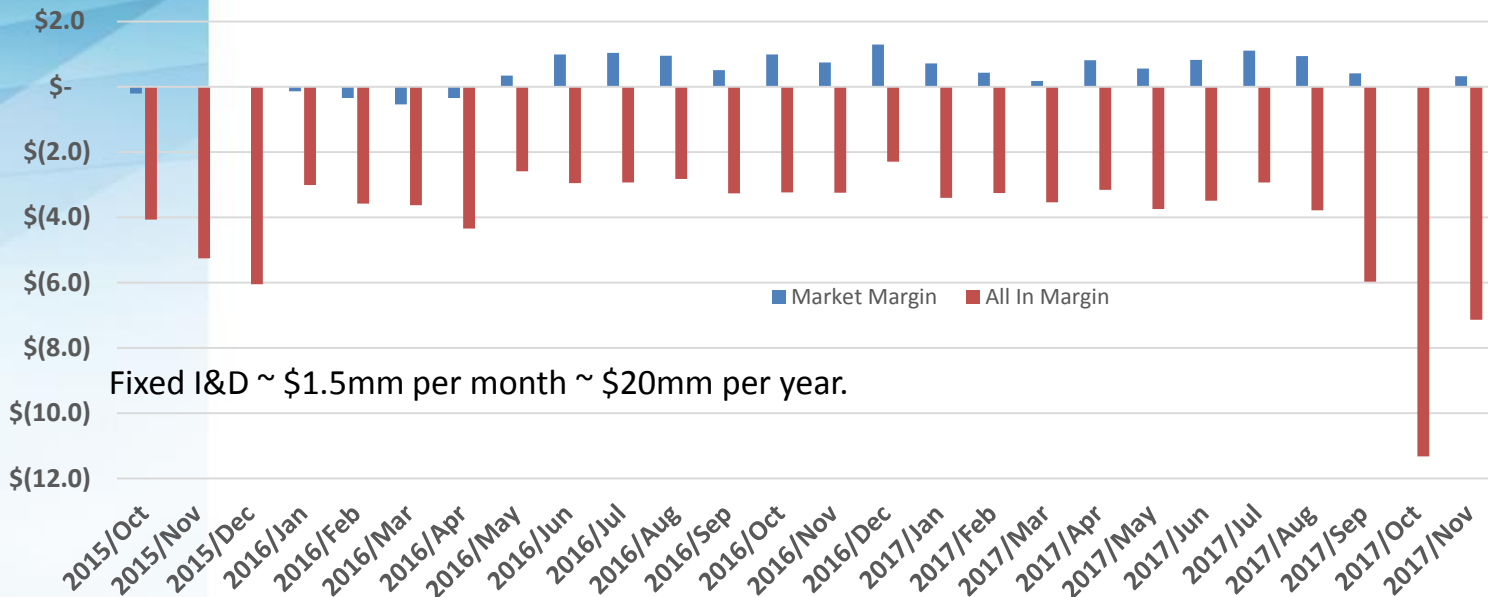
2017 SPP Coal and Gas Market Margins by Month



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Coal = \$100mm Gas = \$15mm

LOS 1 Market & All In Margins



1. Does not assign any capacity value to LOS 1.
2. Project dominos offer implemented in May 2016.
3. Market Margin = LMP - SPP VAR COSTS.
4. All in Margin = LMP - ALL UNIT COSTS.

Graph above does not capture value from capacity!!!

Capacity value = \$300k - \$400k per month based on \$2.50/kW month.

Takeaways

- Must continuously look at short and long-term P&Ls on plants to most effectively operate
- All plants should be looked at in a similar manner outside of other resource portfolio goals
- LOS continues to be challenged. Primary items keeping it viable:
 - Capacity value
 - DGC / AVS coal cost impact
 - Fixed costs at mine excluded from incremental offers
 - Fixed interest and depreciation would still be amortized or written off
- However, with it on the margin, to remain viable through its projected life, it needs to have some significant cost reductions. (primary drivers next slides)

Historical Forward Power Pricing

2018 North Hub On Peak Power Prices



Calendar year 2018 prices have dropped from \$34/MWh in May 2015 to \$25/MWh in Dec 2017.

How low will market prices go?

Wind offers with PTC's are submitted at (\$33.00).

Wind Growth

SPP Wind

End of 2015 = 12GW's

End of 2016 = 16 GW's

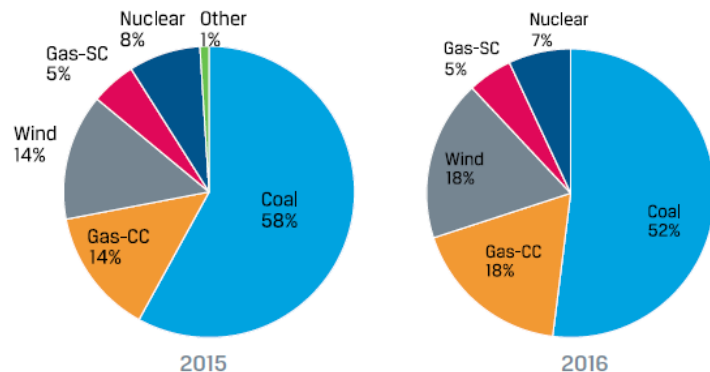
End of 2017 = 18 GW's

End of 2020 = 20 GW's

SPP is uniquely positioned for wind

SPP covers some of the best wind resource sites in the country today with wind energy accounting for 20% of the total generation and 15% of the total installed capacity in 2016. In fact, wind is the only resource type with an increasing share relative to total SPP-wide generation. Wind was 14% of total generation in 2015, increasing to 18% in 2016, and 26% in the first quarter of 2017. In contrast roughly 52% of generation in SPP was sourced from coal based power plants in 2016, down from 58% in 2015. As coal continues to decline in SPP's generation portfolio mix, wind is ready to fill the gap.

Annual generation by fuel type in SPP



Currently have ~37 GW's in the queue

How much wind will get added to the market?

Source: SPP Quarterly and Annual State of the Market reports



Questions?

