TRI-STATE G&T

A Touchstone Energy® Cooperative

Tri-State Resource Discussion

Brad Nebergall
Senior Vice President

La Plata Electric Workshop – June 8, 2017

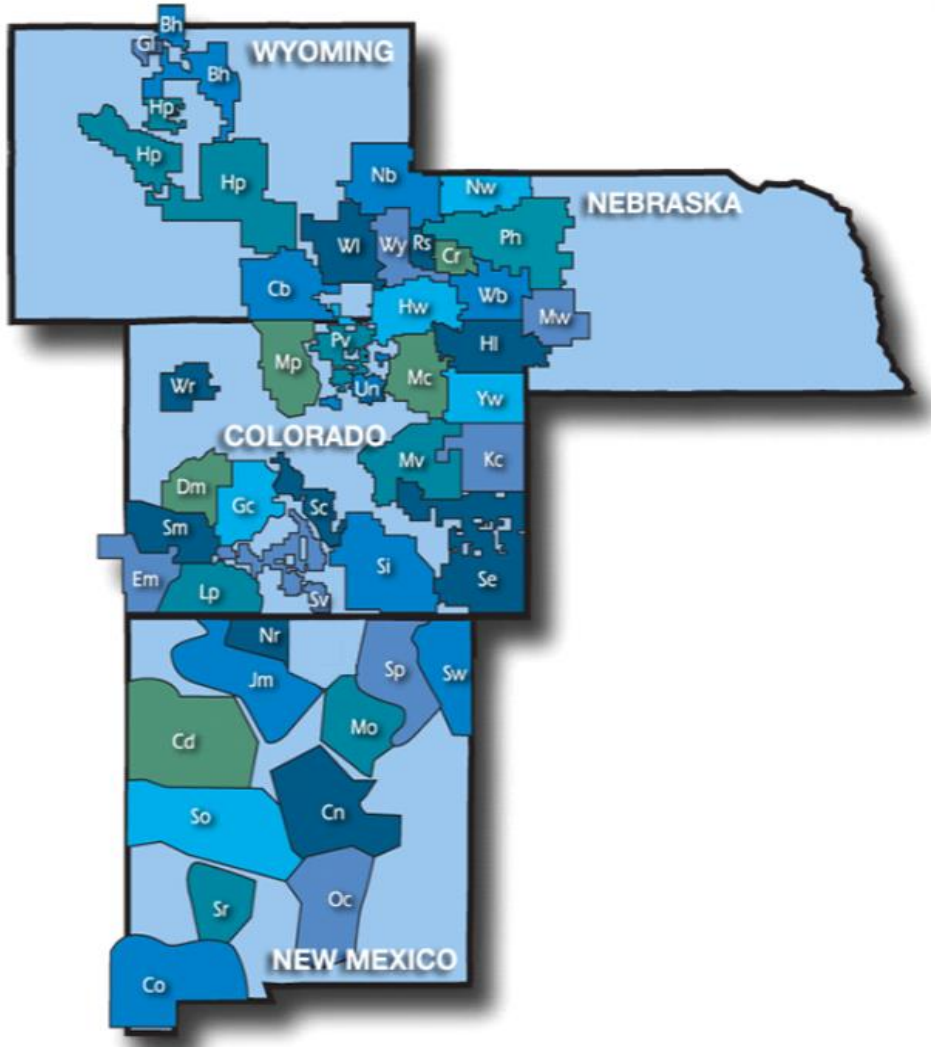
Tri-State Background

- Founded in 1952. 65th anniversary year
- Not-for-profit, cooperative wholesale power supplier owned by the 43 distribution cooperatives it serves
  - Diversity: residential, industrial, irrigation, tourism
- Serve >1.5 million customers (rural & lower income)
- Generation and purchased power portfolio
  - 4,000 MW including coal, gas, oil, wind, solar & hydro
- Transmission: > 5,500 miles of 115, 230 & 345 kV
- Employees: 1,585

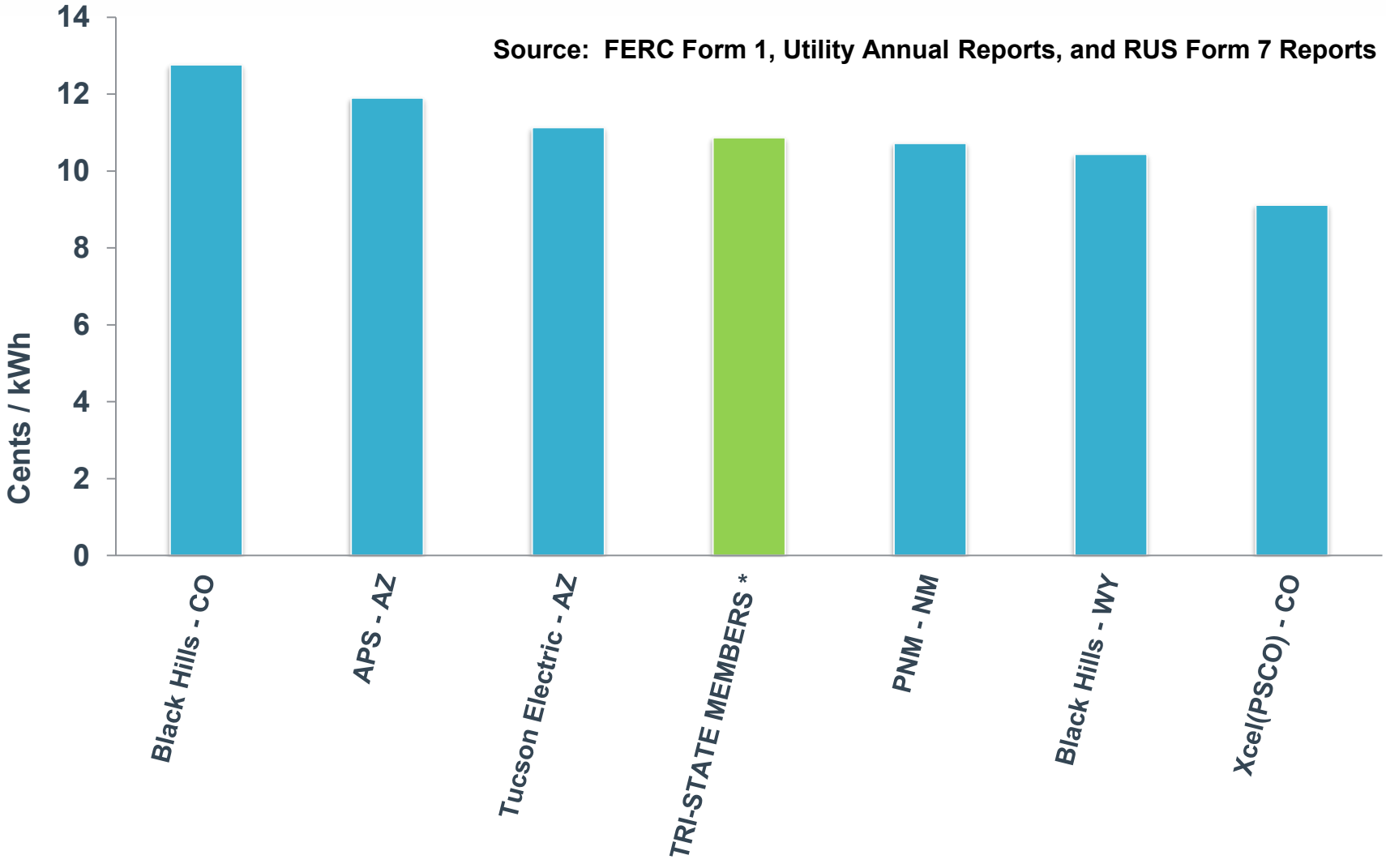
- La Plata Electric ~ 6% of Tri-State member usage

Tri-State 2016 Financial Data

- Revenue: $1.4B
- Assets: $4.9B
- Liabilities: $3.8B
- Equity: $1.1B
  - La Plata equity = ~$75M
  - La Plata owns ~ 8%
- Financial Ratings: “A”

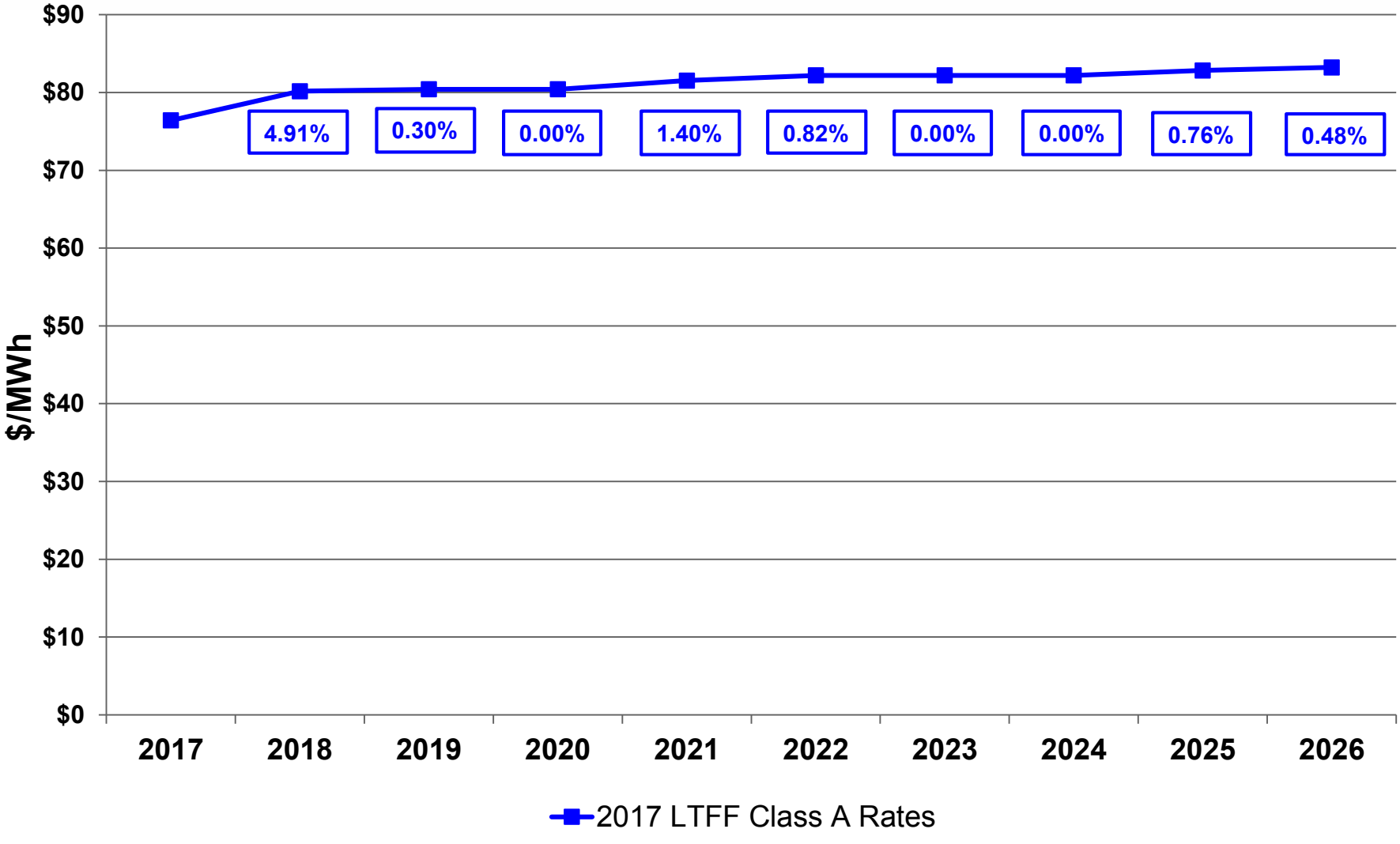


2016 Average Retail Rates



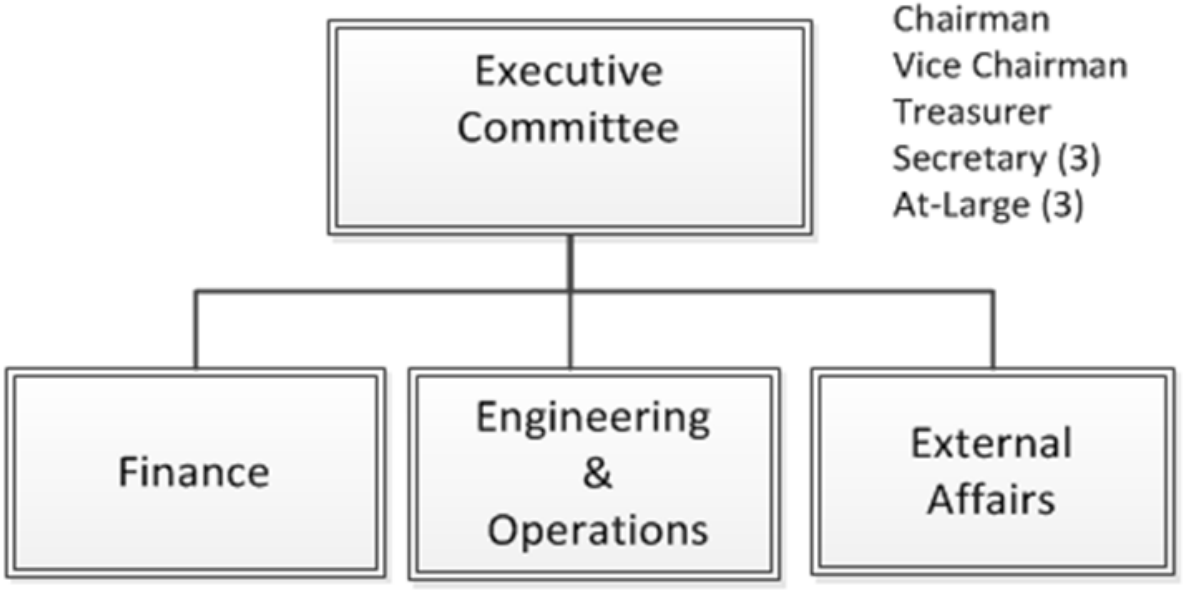
*Data for San Miguel Power Association is from 2015

Class A Rate Forecast



Tri-State Governance

- Board of Directors plays unusually strong role
  - Approves all contracts > $500,000 value
  - Meet monthly. Each member has one vote
  - Strategic planning twice each year



Common Priorities

1. **Safety**
2. **Compliance**
3. **Reliability**
4. **Cost**

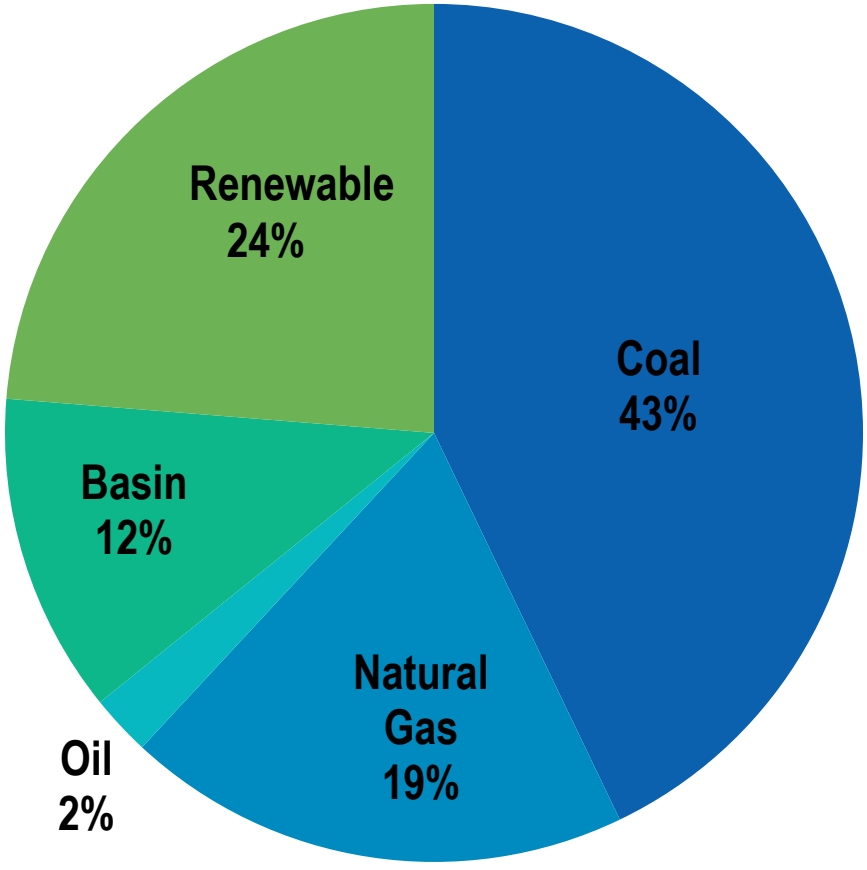
Current Tri-State Resources

Tri-State Cost Components

- Generation
  - 79% of overall Tri-State expense
  - Majority of generation cost is fixed
  - Some fuel and some operations and maintenance expense is variable
  - **Incremental cost is approximately $.02 / kWh**
- Transmission:
  - 21% of overall Tri-State expense
  - 100% fixed cost

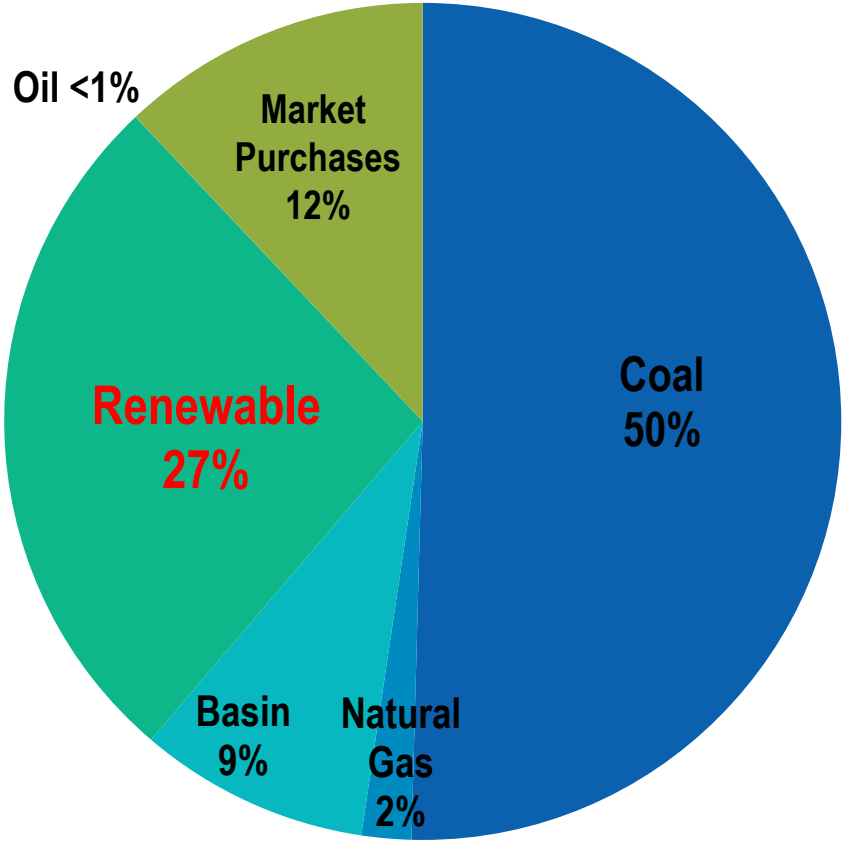
2016 Tri-State Resource Mix

2016 Capacity (%)



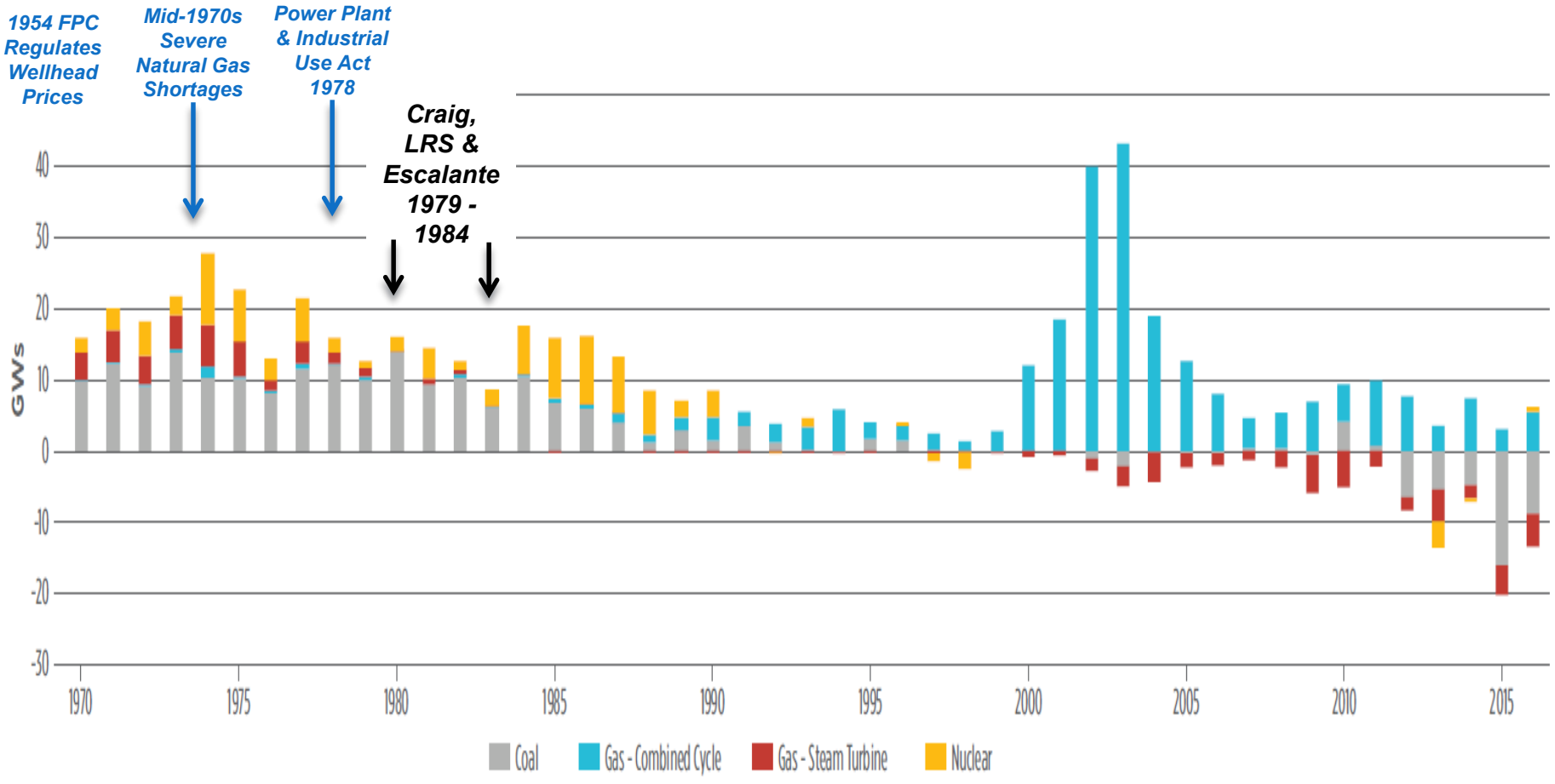
2016 Energy

As a % of gross member sales



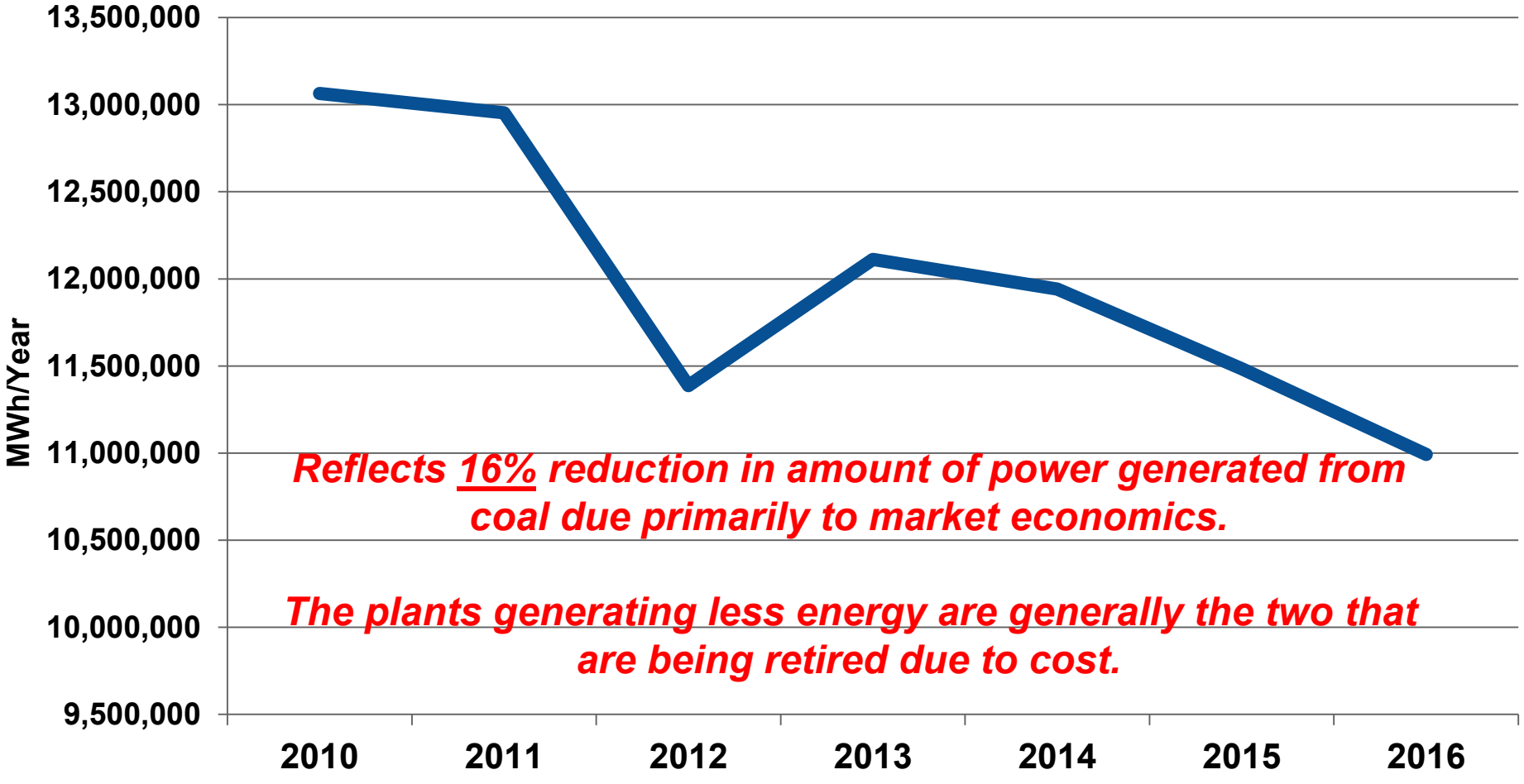
U.S. Baseload Generation

1970 - 2016

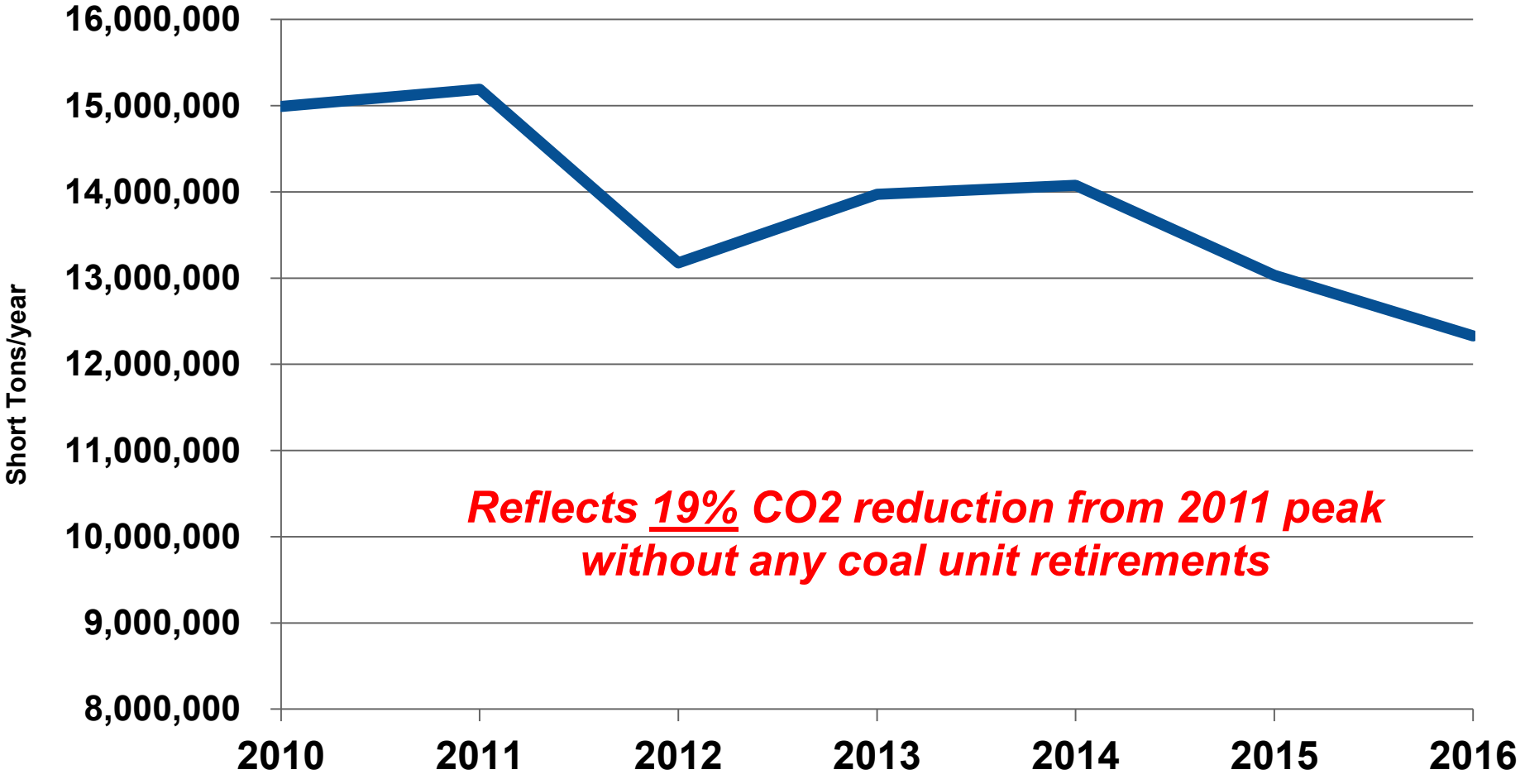


Source: SNL; ScottMadden analysis

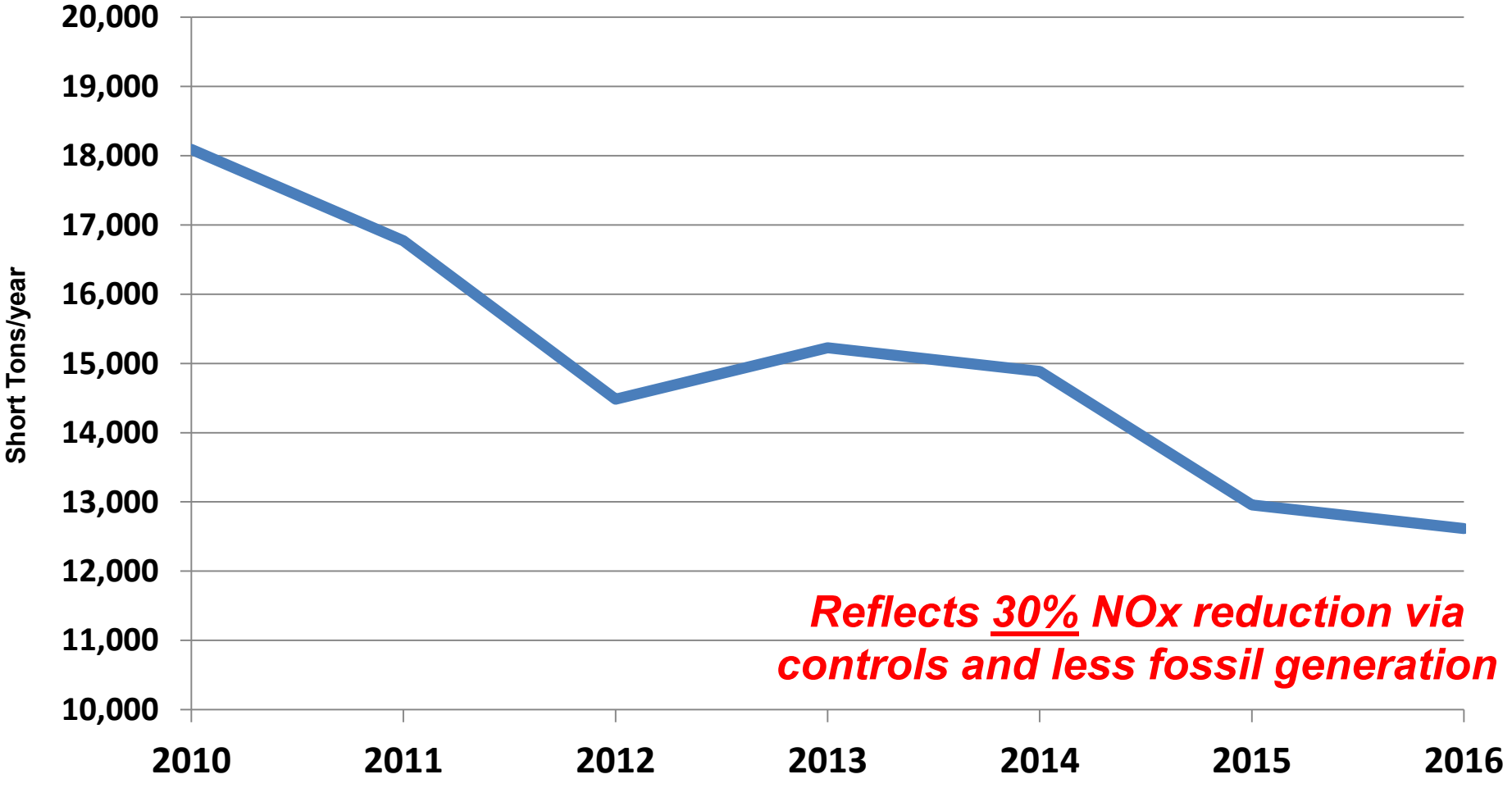
Coal Generation



Tri-State Total CO2 Emissions



Tri-State Total NOx Emissions



Environmental Controls

	Sulfur Dioxide Removal	Particulate Collection / Removal		Nitrogen Oxide Reduction / Removal			
	Flue Gas Desulfurization (FGD) Scrubber System	Fabric-Filter Baghouses	Electrostatic Precipitators	Low Nitrogen Oxide Burners	Selective Catalytic Reduction (SCR)	Selective Non-Catalytic Reduction (SNCR)	Combustion Optimization
Craig 	✓	✓			✓		
Nucla 	✓	✓			✓		
Escalante 	✓	✓			✓		
Laramie River 	✓	✓			✓		
San Juan #3 	✓	✓			✓		
Springerville #3 	✓	✓			✓		

All of Tri-State's facilities meet or exceed Federal and State Clean Air and Water Standards

Coal Retirements & Renewables

- Three announced coal unit retirements
- Employee and community transition
- Costs
  - **Incremental cost of existing baseload generation is cheaper than variable renewables**
  - Employee transition
  - Reclamation
  - Accelerated depreciation

SCHEDULED COAL UNIT RETIREMENTS

Unit	Total Capacity (MW)	Tri-State Capacity (MW)	Retirement Date	Original Retirement Date	Increased Depreciation Expense
San Juan #3 *Waterflow, NM*	500	41	2017	2046	$8.2 M
Nucla *Nucla, CO*	100	100	2022	2049	$8.4 M
Craig #1 *Craig, CO*	428	104	2025	2051	$2.3 M
TOTALS	1,028	244			$19 M

Resource Additions

Year	Resource	Fuel	Megawatts
2008	Rawhide	Natural Gas	100
2009	Shafer	Natural Gas	150
2009	Brush	Natural Gas	70
2010	Kit Carson	Wind	51
2011	Cimarron	Solar	30
2011	Shafer	Natural Gas	122
2012	Basin Electric	Unspecified	75
2012	Colorado Highlands	Wind	67
2013	Boulder Canyon	Hydro	5
2013	CHW 2	Wind	24
2014	Ridgway	Hydro	8
2014	Vallecito	Hydro	6
2015	Shoshone	Hydro	3
2016	Carousel	Wind	150
2016	San Isabel Solar	Solar	30
2017	Williams Fork	Hydro	3.5
2017	Alta Luna	Solar	25
2017	Twin Buttes	Wind	76
2008-present	Member Generation	Various	113 *

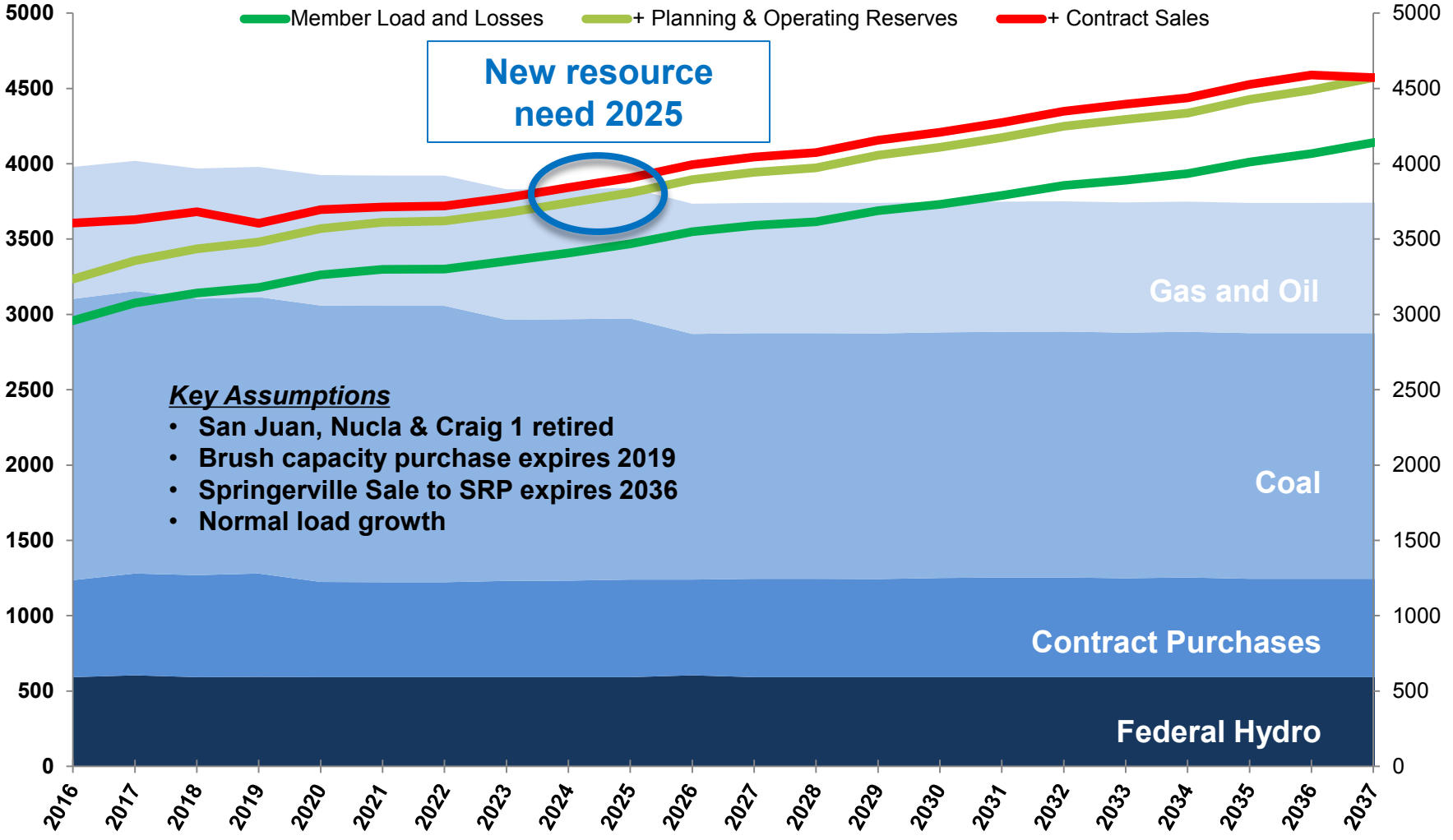
18 Resource Additions

Renewables:	592 MW
Natural gas:	442 MW
Unspecified:	75 MW
Total	1,109 MW

* Tri-State provided financial incentives

Summer Capacity Position

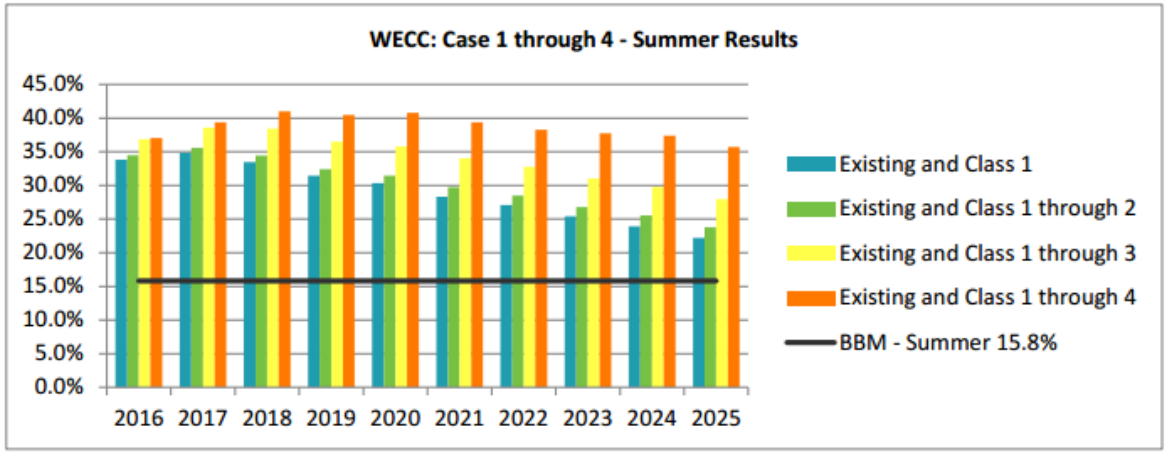
2017 LTFF Base Case Scenario



Industry Excess Capacity

Summary of Assessment Results: WECC – Summer

The numbers represented here are a summary from the PSA datasheets and cannot be used independently to replicate the assessment results. For complete information, please access the PSA datasheets posted on the WECC website.



WECC: Case 1 – Existing/Class 1 Resources Summer Results	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Net Internal Demand	151,243	152,317	154,558	157,197	159,045	160,399	161,395	162,987	164,933	166,572
Anticipated Internal Capacity	202,410	205,371	206,300	206,650	207,334	205,822	205,105	204,386	204,364	203,525
Wind Expected On-Peak MW	8,191	8,230	8,230	8,402	8,402	8,402	8,402	8,402	8,402	8,402
Percentage of Wind Capacity	32.2%	32.2%	32.2%	32.3%	32.3%	32.3%	32.3%	32.3%	32.3%	32.3%
Solar Expected On-Peak MW	3,209	3,547	3,956	4,412	4,412	4,412	4,412	4,412	4,412	4,412
Percentage of Solar Capacity	37.1%	37.1%	37.0%	36.9%	36.9%	36.9%	36.9%	36.9%	36.9%	36.9%
Hydro Expected On-Peak MW	43,077	43,101	43,114	43,127	43,336	43,336	43,336	43,336	43,336	43,336
Percentage of Hydro Capacity	60.4%	60.4%	60.4%	60.4%	60.2%	60.2%	60.2%	60.2%	60.2%	60.2%
Anticipated Resource Reserve Margin MW	27,271	28,988	27,322	24,616	23,160	20.080	18,209	15,647	13,372	10,635
Anticipated Resource Reserve Margin %	33.8%	34.8%	33.5%	31.5%	30.4%	28.3%	27.1%	25.4%	23.9%	22.2%

Renewables

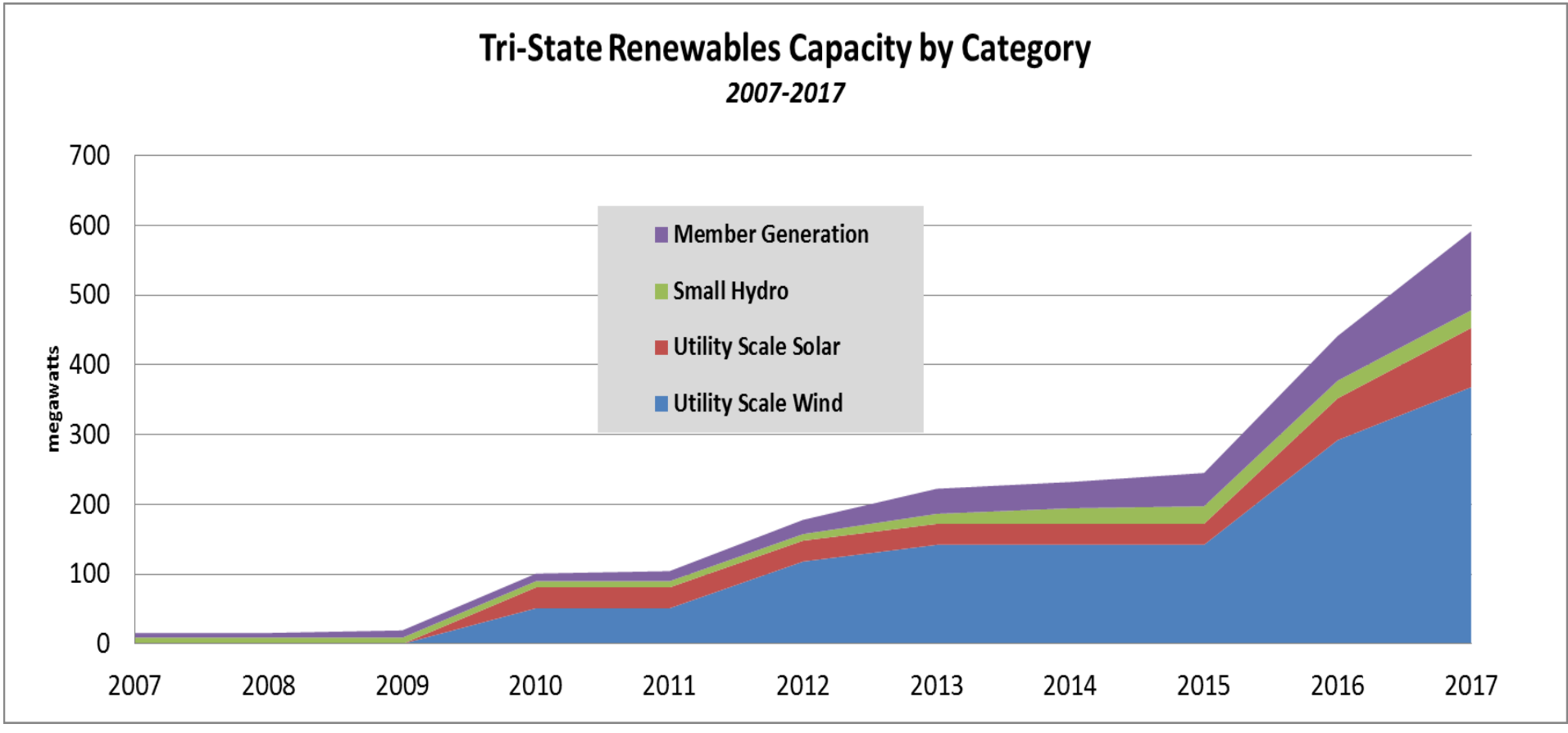
Tri-State Federal Hydropower

- Two purchased power agreements
  - Colorado River Storage Projects
    - Upper/Lower Molina, McPhee, Towaoc, Elephant Butte
  - Loveland Area Projects
    - Big Thompson, Estes, Flatiron, Green Mountain, Seminoe

- 2016 Data
  - $82.4M power purchase expense
  - Approximately 600 MW & 2,350,000 MWH/Year
  - Served 15% of Tri-State member load

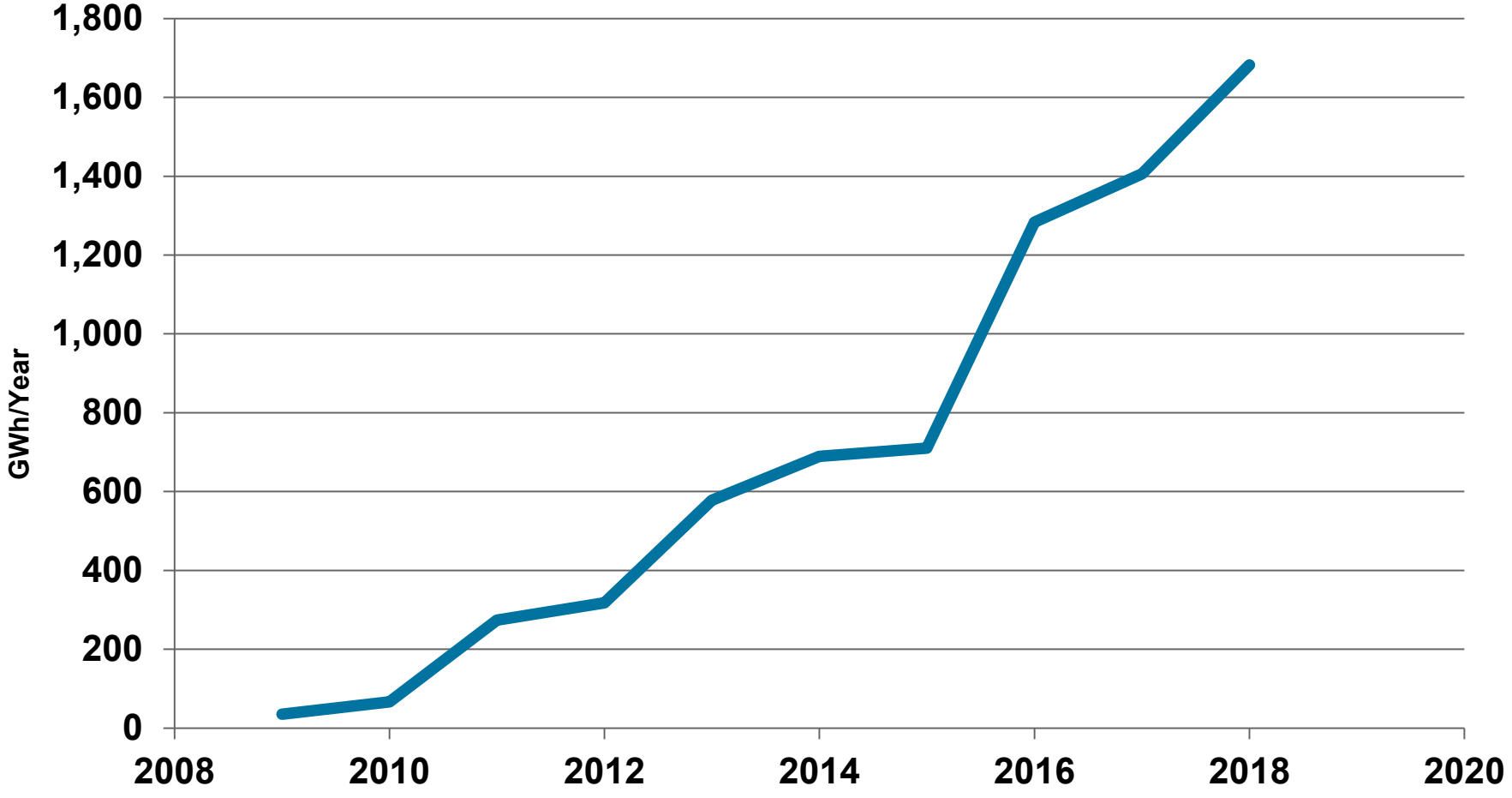
Tri-State & Member Renewables

Excludes WAPA Hydro

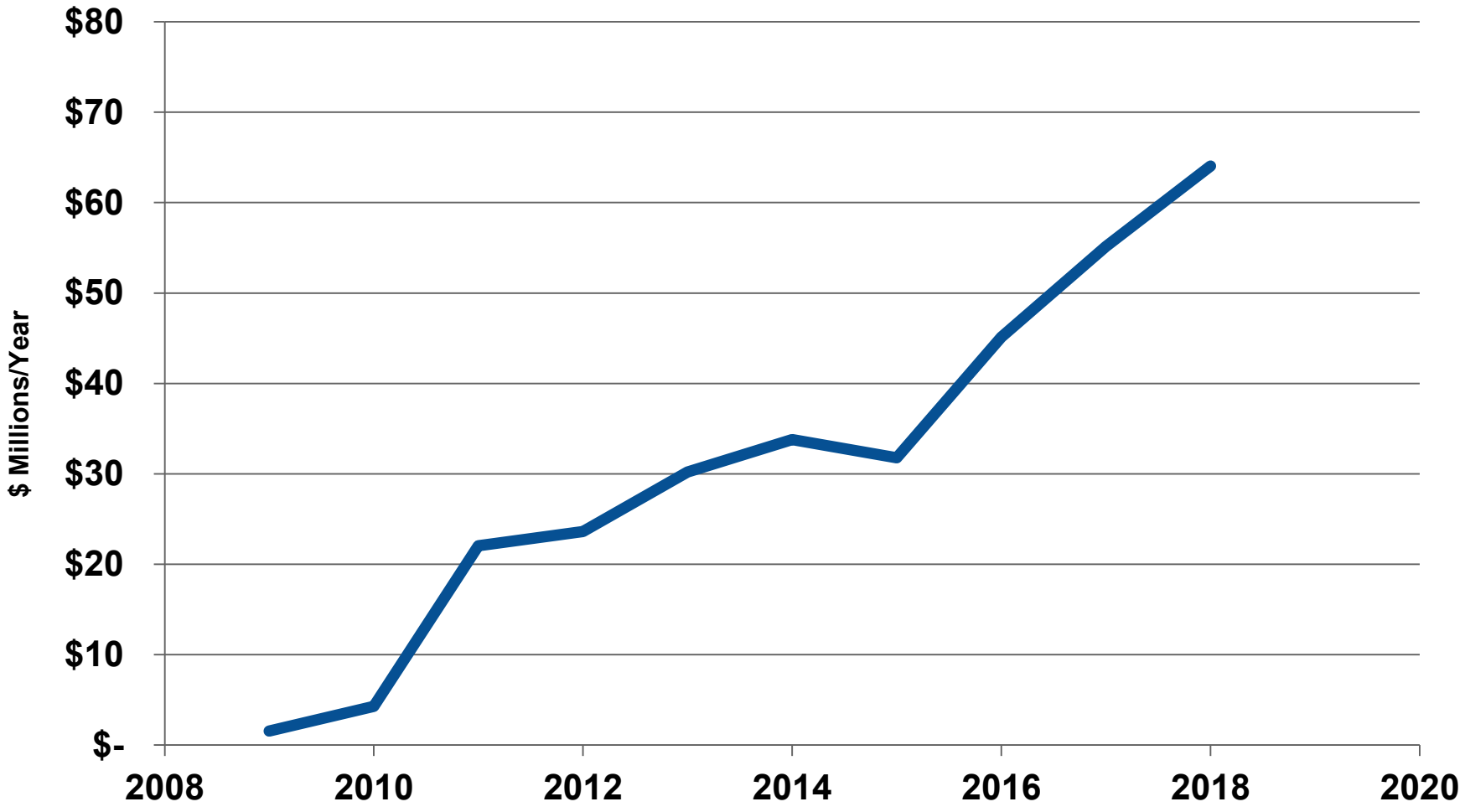


Tri-State Wind & Solar Generation

2016 LPEA Total Load was 945 GWH



Tri-State Wind & Solar Expenditures

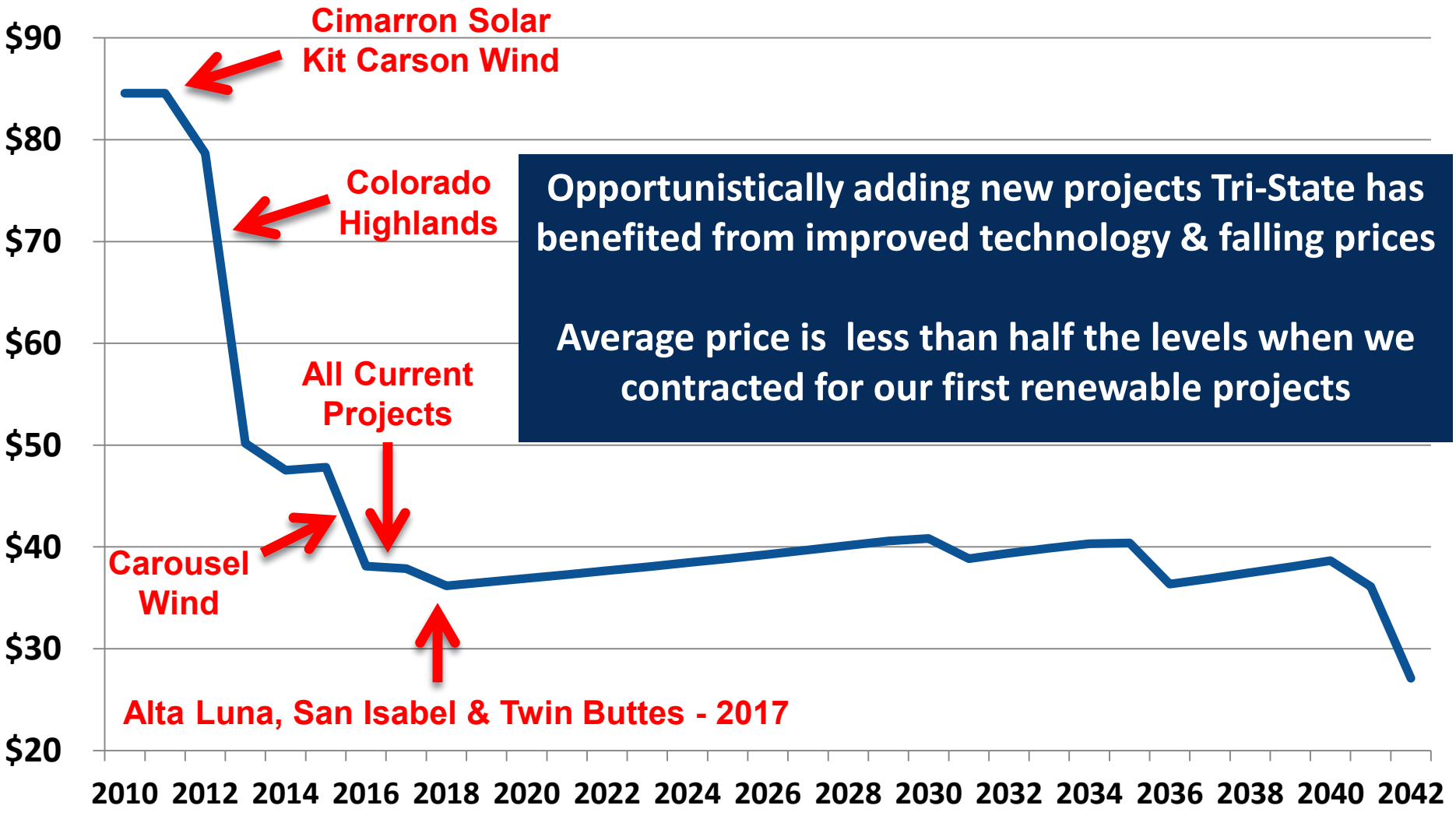


Renewable Pricing Trends

- Price of new renewable generation is heavily impacted by federal tax credits & MACRS
  - Wind PTC = +60% Solar ITC = +30%
- "Utility-scale" projects PPA prices
  - New wind generation: 2 to 3 cents / kWh
  - New solar generation: 3 to 4 cents / kWh
- Must add Integration costs to get total costs
  - Dispatchable back-up – redundant units
  - Balancing Authorities charge .1 to .5 cents / kWh
- Transmission is a major issue for wind

Tri-State Renewable Prices Falling

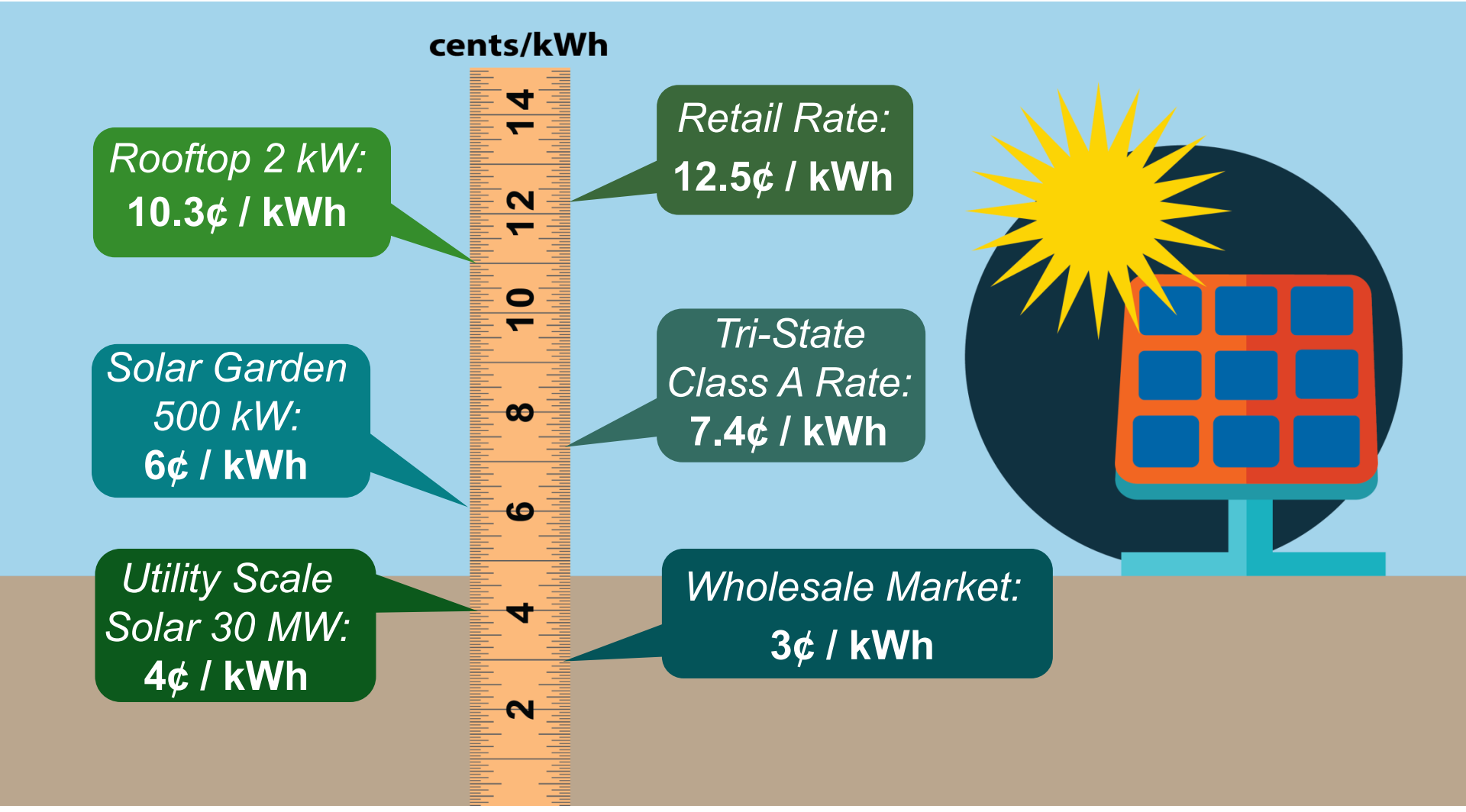
Wind & Solar Weighted Average Purchase Prices



Opportunistically adding new projects Tri-State has benefited from improved technology & falling prices

Average price is less than half the levels when we contracted for our first renewable projects

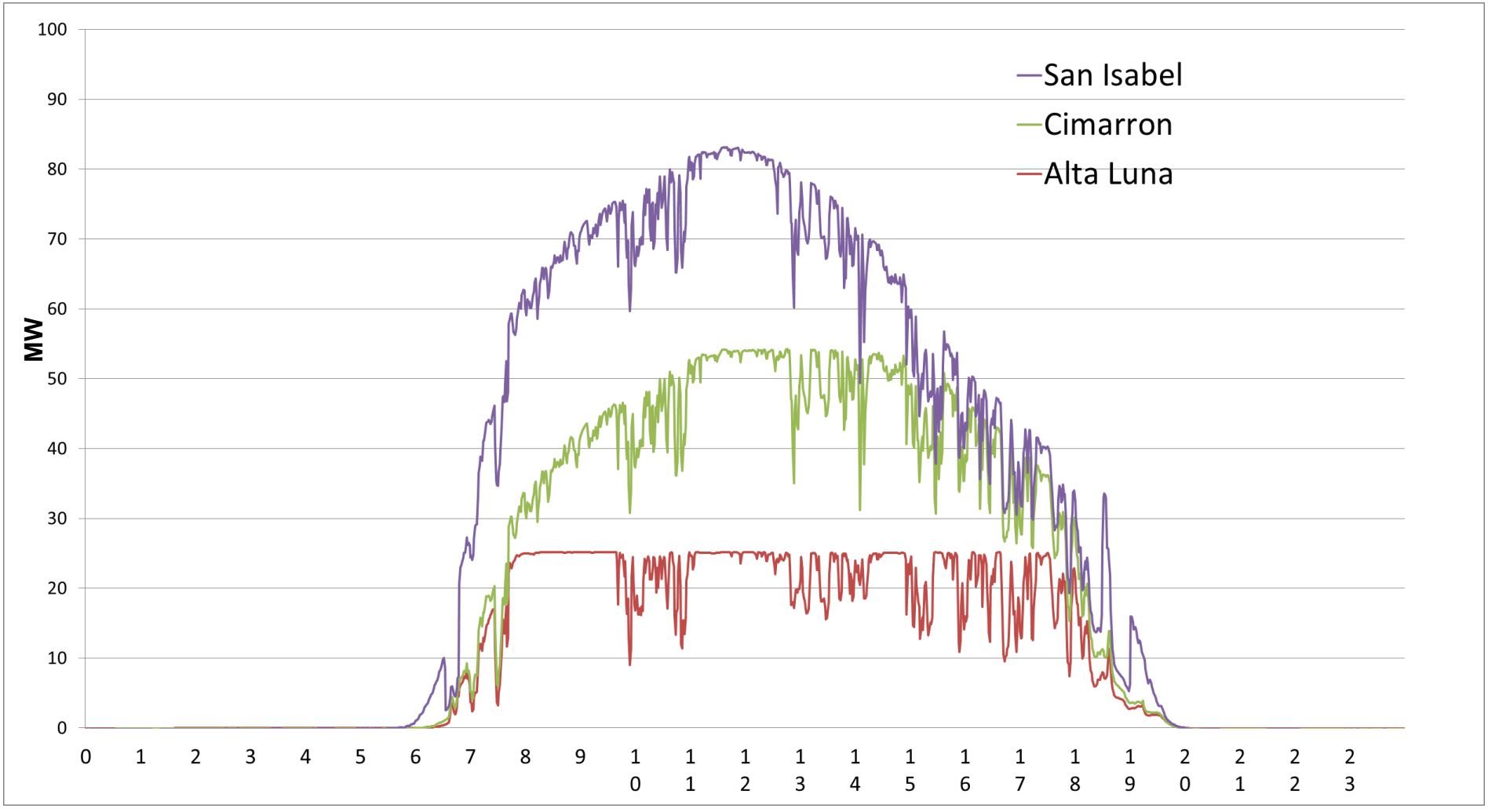
Relative Costs of Solar Generation



* Solar pricing assumes full ITC qualification; tax incentives set to phase out

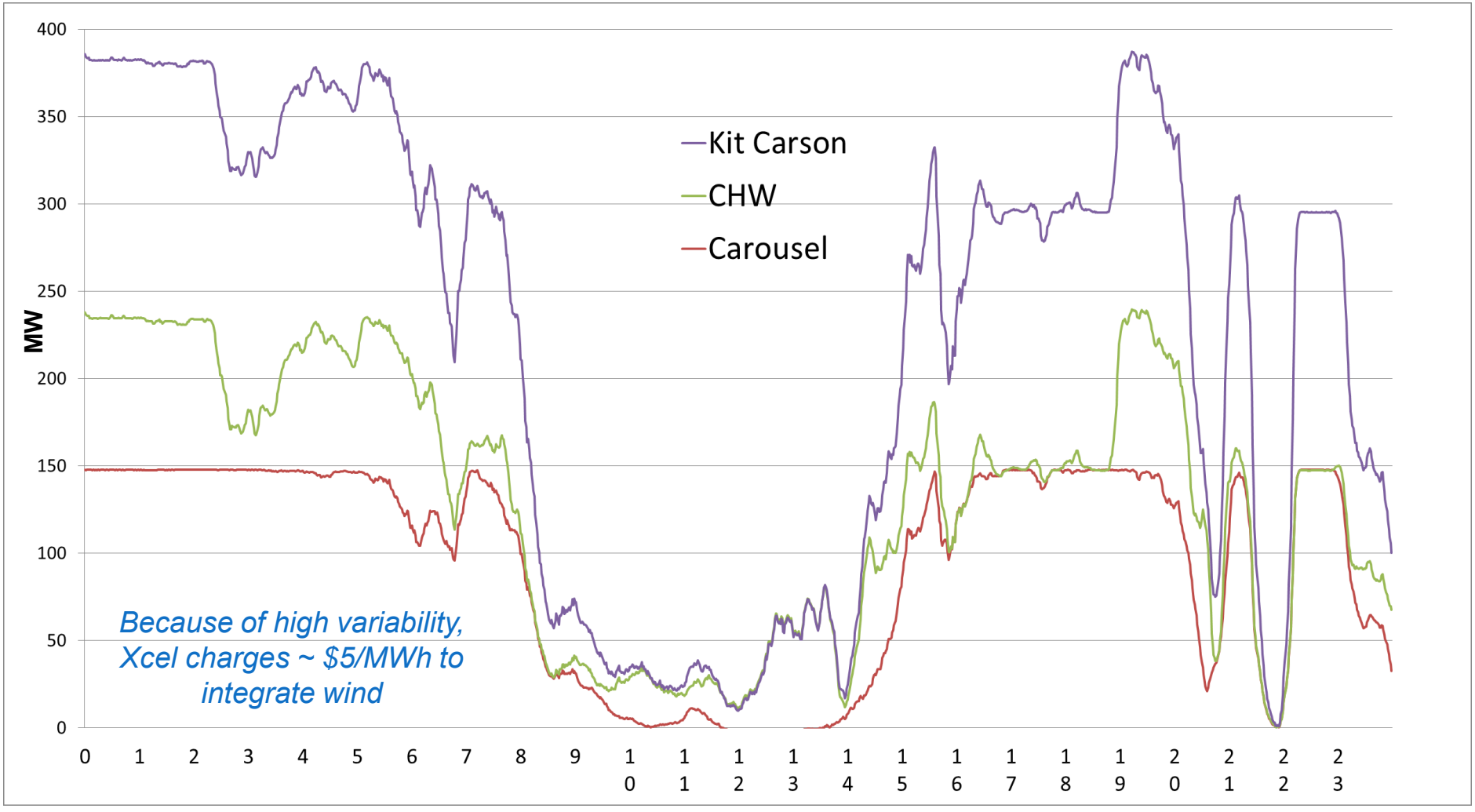
Tri-State Solar Project Generation

May 25, 2017



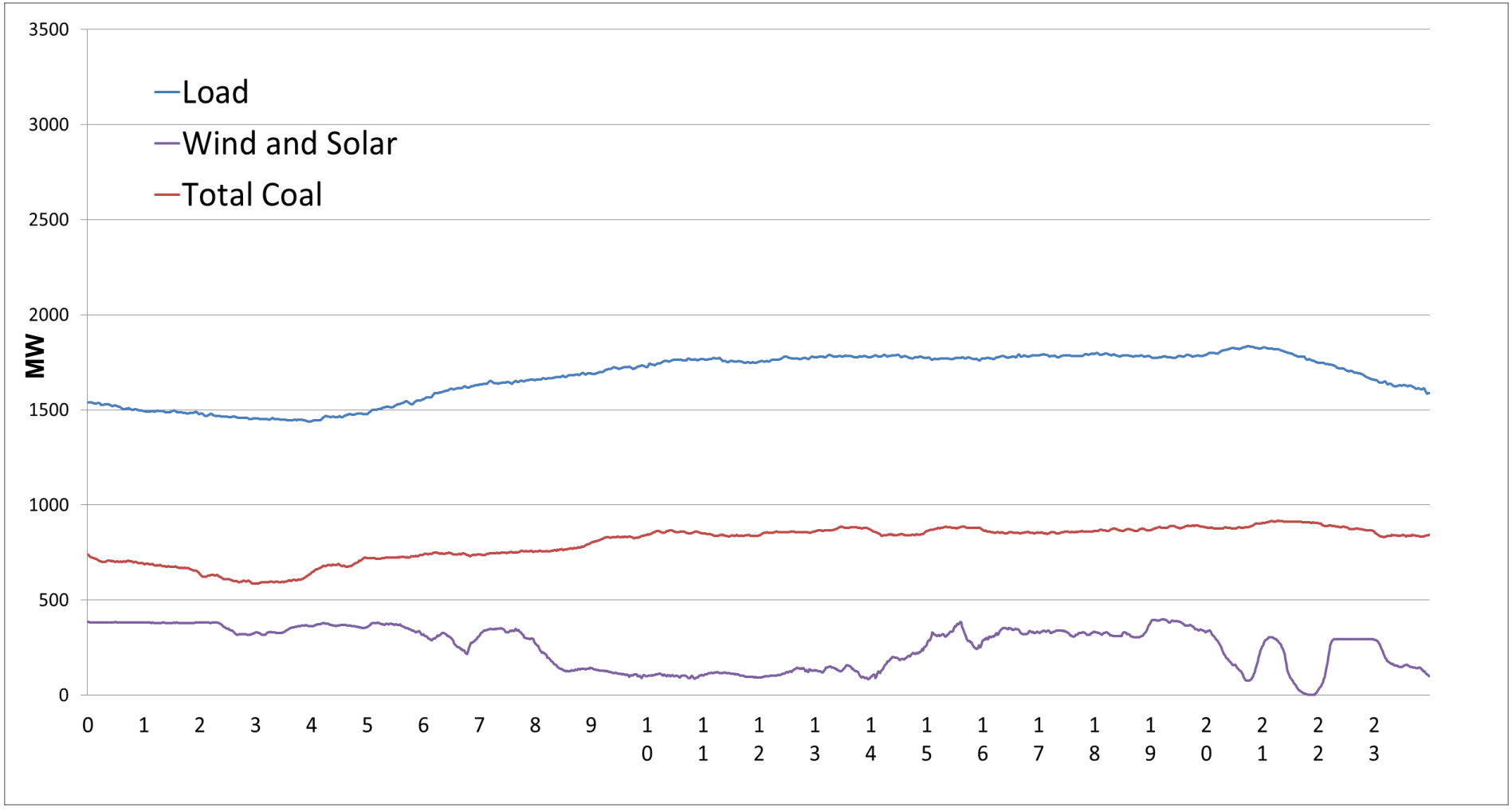
Tri-State Wind Project Generation

May 25, 2017



Tri-State Load, Coal, Wind & Solar

May 25, 2017

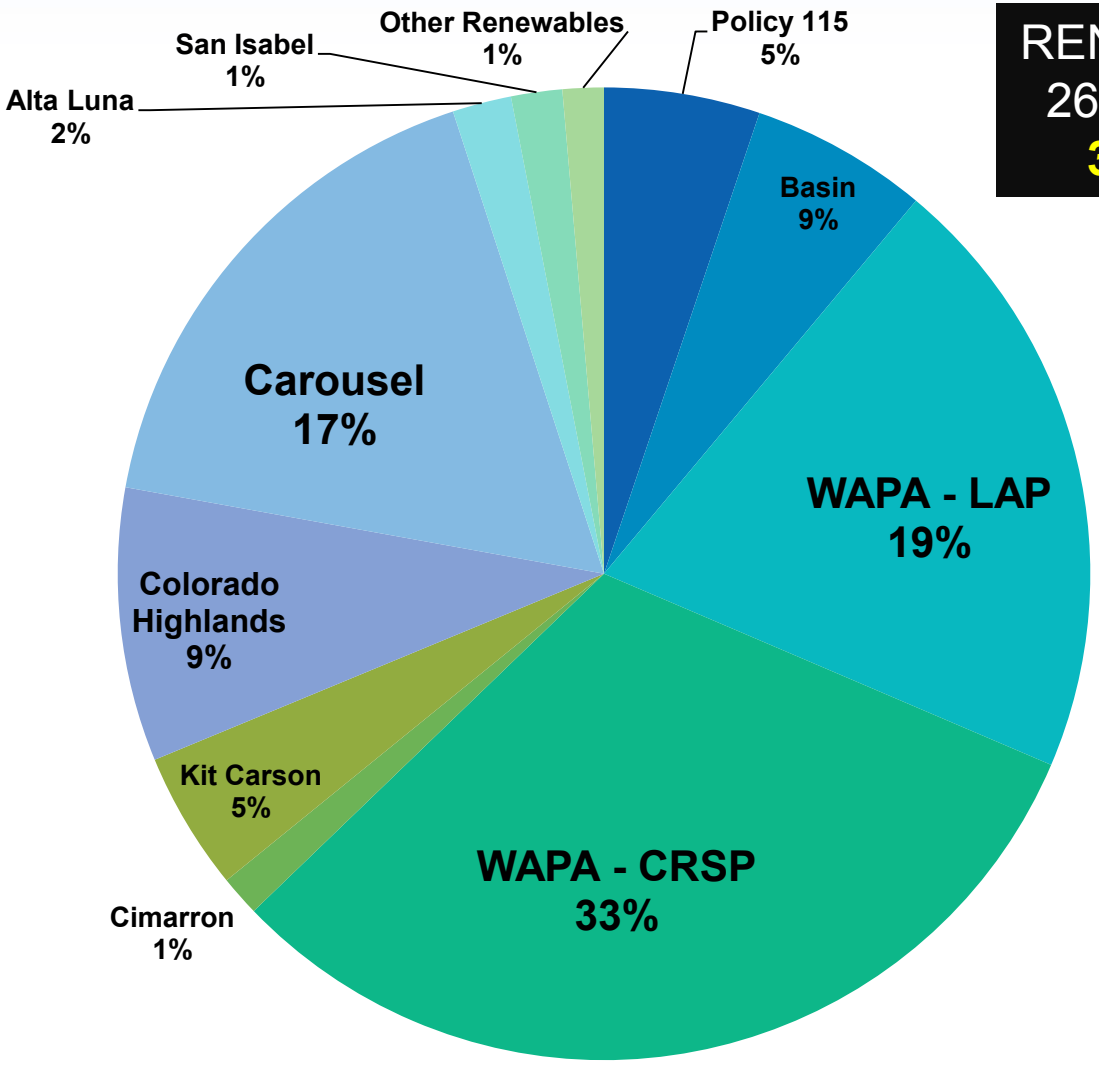


Implications

- Wind and solar need to be supplemented and "backed-up" with conventional hydro, coal and gas generation
- Today, you cannot realistically replace coal 1:1 with intermittent renewables
- Battery or other storage technology could change this situation

Renewable Generation

April 2017



RENEWABLES = 379 GWH
26% of Total Power Supply
32% of Member Sales

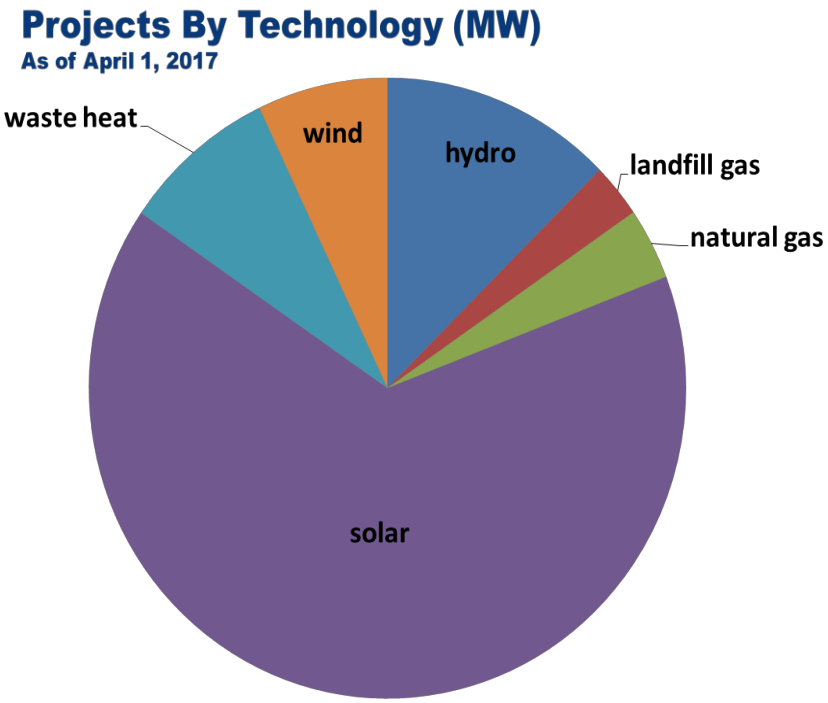
Member Generation

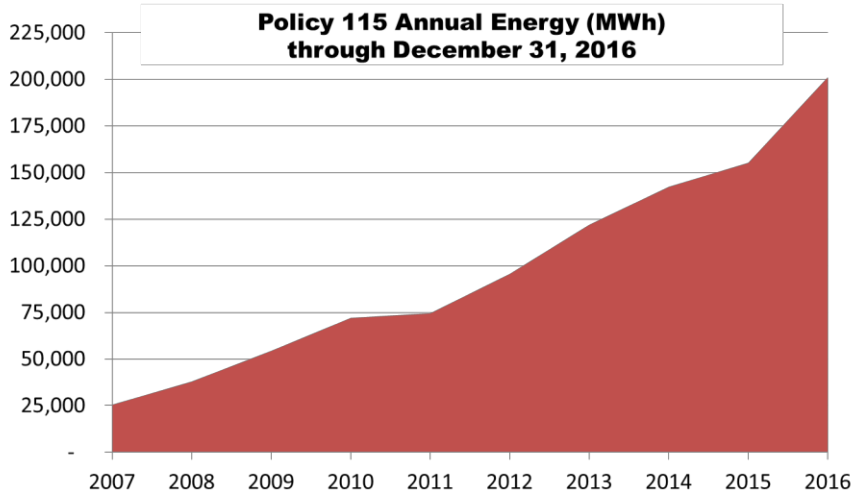
Tri-State Member Generation

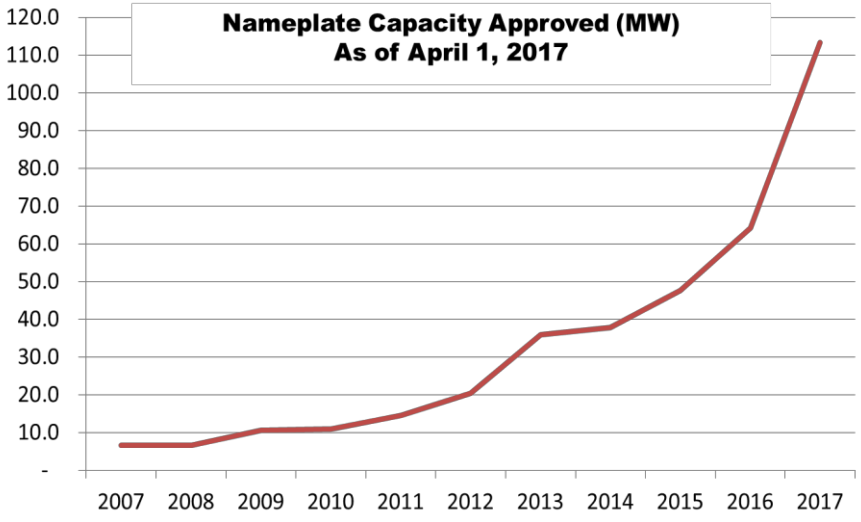
- In 2001 Tri-State and each of its Members signed a new Wholesale Electric Service Contract that had provisions to allow for (but not require) 5% Member "self-generation"
- Tri-State Board Policy contains the specifics of the implementation details concerning this option
- Many cooperative generation and transmission organizations do not allow any member generation

Member Generation Today

113 MW
61 Projects
18 Member Systems







Policy 117 – Payment History

Year	Policy 115 Projects	Net Metered Projects	Total Policy 117 Member Payments
2009	$270,483	$123,258	$393,741
2010	$394,765	$326,699	$721,464
2011	$1,089,958	$492,188	$1,582,146
2012	$1,482,466	$238,979	$1,721,445
2013	$2,108,641	$294,773	$2,403,414
2014	$2,057,831	$364,931	$2,422,762
2015	$2,181,250	$627,039	$2,808,289
2016	$2,068,064	$522,580	$2,590,644
Total			**$14,643,905**

La Plata Concerns

Two Questions

1. Why can't Tri-State members generate more than 5%?

2. Why can't Tri-State retire coal faster and add more renewables?

5% Member Generation

- Creates upward rate pressure
- Wholesale Electric Service Contract
  - To increase 5% would need to be renegotiated
- Members can generate above 5%
  - Sell to Tri-State
  - Sell to others

Why Can't We Do More, Faster?

- Creates upward rate pressure
  - Adding generation above our incremental cost increases rates
    - Current Class A rate: ~ 7 cents/kWh
    - Current market rate: ~ 3 cents/kWh
    - Current incremental cost: ~ 2 cents/kWh
- Wind and solar, despite price reductions in recent years, are still priced above our incremental cost
- Don't need new capacity until 2025
- Retiring units = accelerated depreciation & closure costs

Summary

- Tri-State is financially strong
- Tri-State & Members are currently leaders in renewable energy and more being done
- Three coal units are being retired
- Added +1000 MW of renewable and natural gas in last 10 years
- Aggressively pursuing RTO membership
  - Operating efficiencies, reduced costs & easier to integrate variable resources (wind and solar)
- Tri-State rate forecast best in last 10 years

TRI-STATE G&T

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