EPA's Final Clean Power Plan: Off the Cliff, but Challenges Remain

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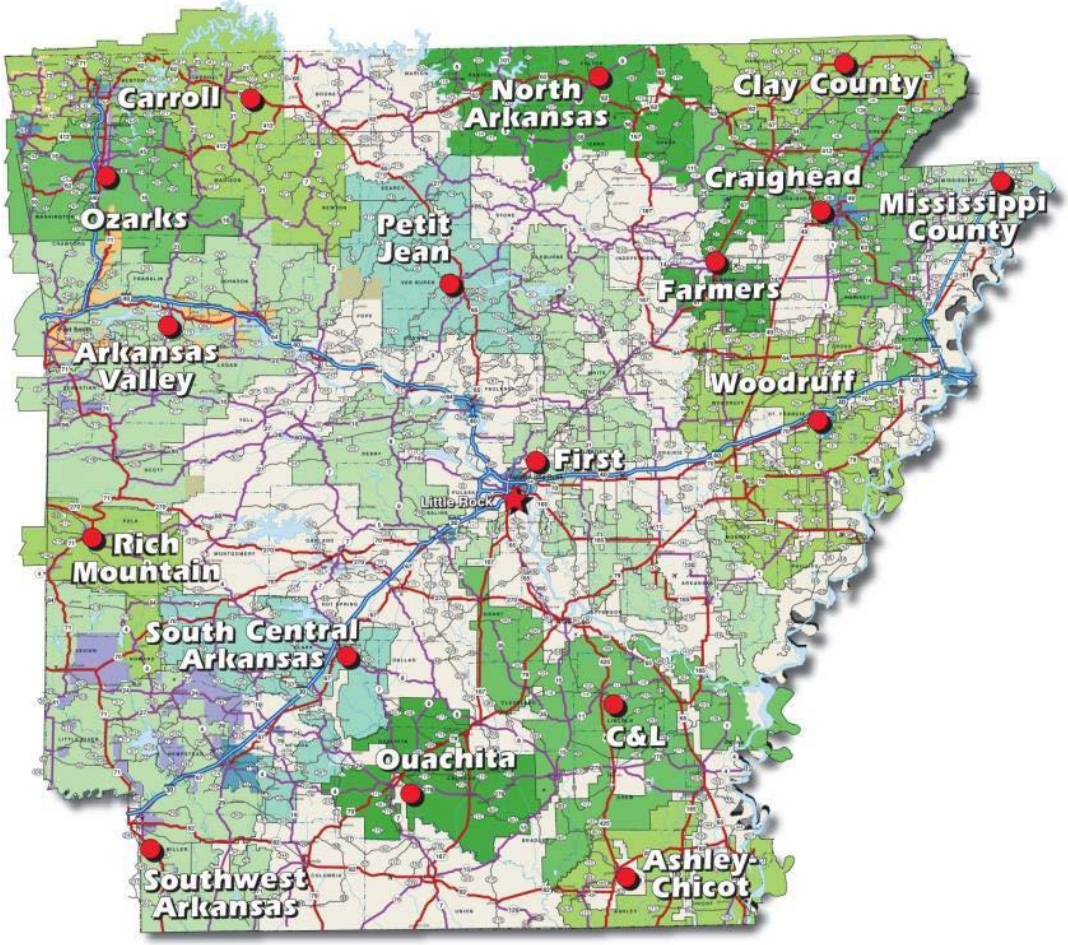
Arkansas Electric Cooperatives Territory Map



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Reliable
Affordable
Responsible

Powering Communities and

Empowering Members to

Improve the Quality of Their Lives

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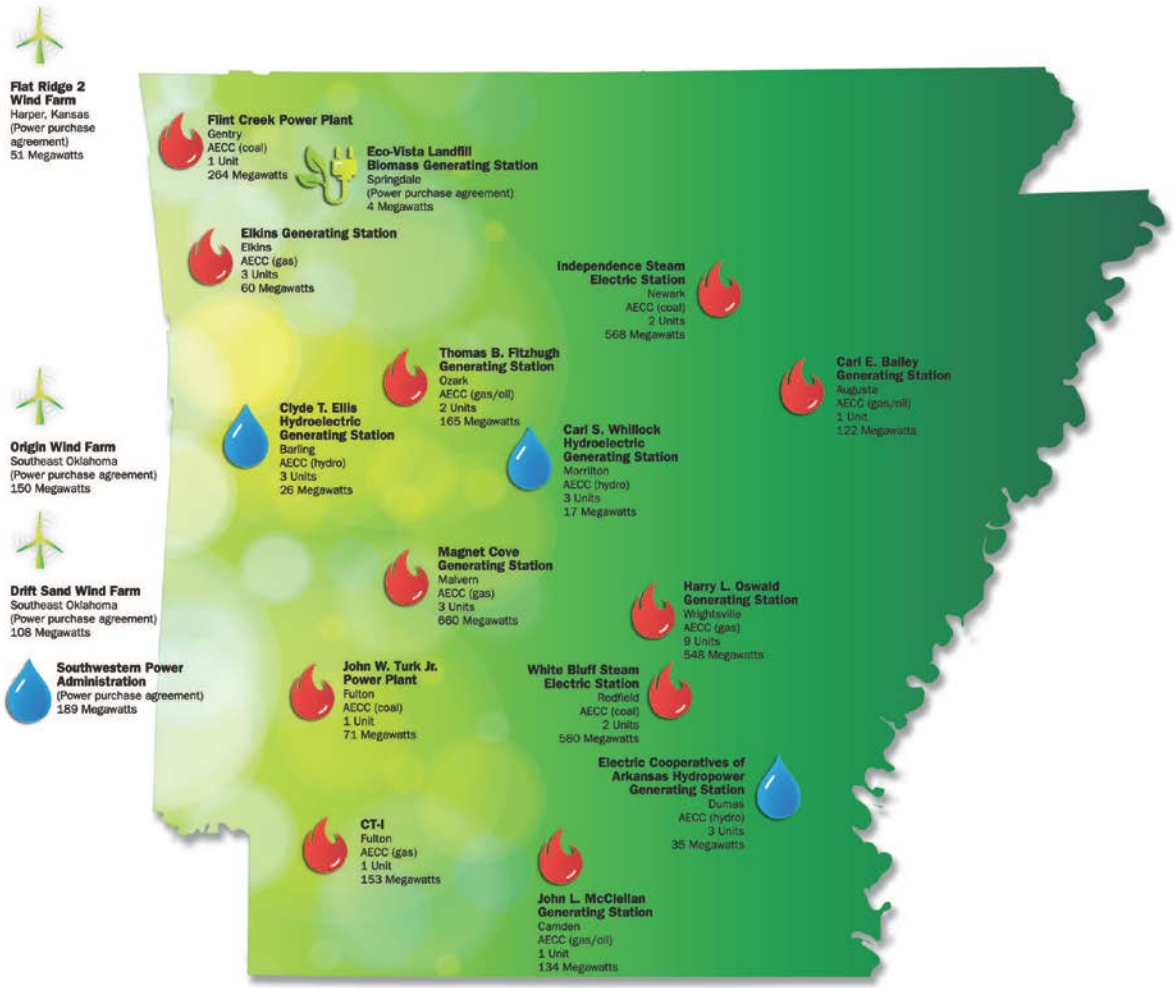
Arkansas Electric Cooperative Power Plant Map



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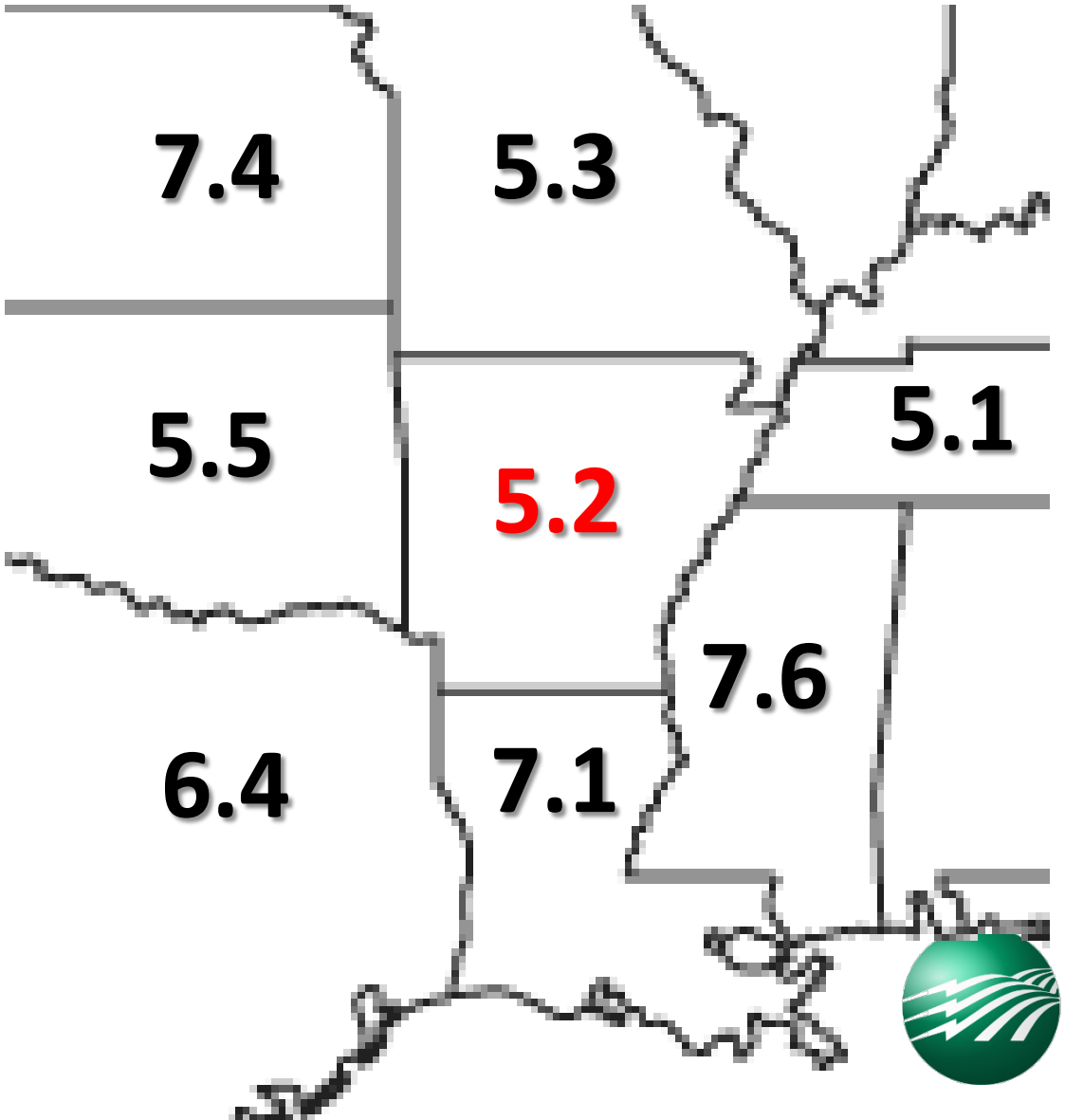
Affordable



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Average U.S. Retail Electricity Prices

Rank	State	Price (c/kWh)	Rank	State	Price (c/kWh)
1	WA	8.93	26	NM	12.01
2	ID	9.64	27	IL	12.02
3	WV	9.71	28	CO	12.23
4	ND	10.02	29	MN	12.24
5	**AR**	**10.07**	30	AZ	12.59
6	LA	10.24	31	SC	12.6
7	MT	10.27	32	KS	12.71
8	OK	10.43	33	OH	12.88
9	NE	10.52	34	NV	13.2
10	KY	10.55	35	PA	13.25
11	OR	10.57	36	DE	14
12	WY	10.6	37	MD	14.21
13	UT	10.79	38	WI	14.24
14	TN	10.91	39	MI	14.87
15	SD	10.99	40	ME	15.4
16	NC	11.38	41	NJ	15.48
17	VA	11.4	42	CA	16.48
18	IA	11.51	43	MA	17.63
19	IN	11.77	44	NH	17.99
20	GA	11.83	45	RI	18.08
21	AL	11.83	46	VT	18.18
22	FL	11.84	47	AK	19.84
23	TX	11.89	48	CT	20.18
24	MO	11.91	49	NY	20.62
25	MS	11.98	50	HI	38.04

Source: US Department of Energy

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Recap: The 2014 Draft Rule

- Arkansas was targeted with a 44% carbon dioxide emission reduction by 2030; 7th worst in the nation
- 41% reduction had to be achieved by 2020
- Immediate coal plant retirement necessary
- No time to build replacement generation
- Severe reliability implications
- Cost increases of 10 – 30% based on gas prices

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The Final Rule

- Arkansas' target was lowered to 36%; but based on business-as-usual utility plans, 27% is the projected decrease required by 2030
- Arkansas now close to the mid-range in U.S. (20th instead of 7th in reduction percentages)
- Interim compliance delayed until 2022
- EPA included a Reliability Safety Valve
- Allows credits for renewables and efficiency
- Gives states 3 years to develop State Plans

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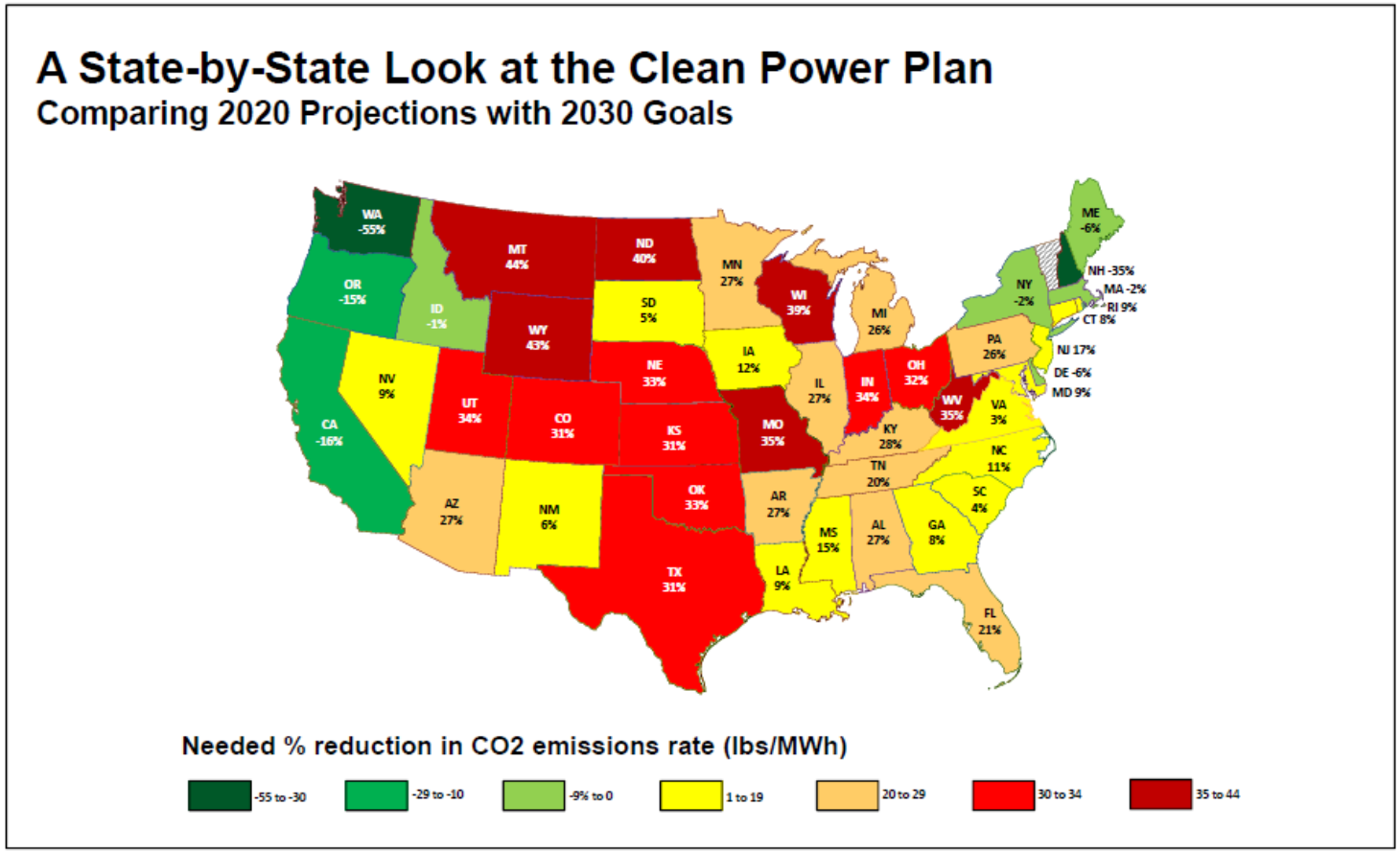
Arkansas Fares Better in Final Plan



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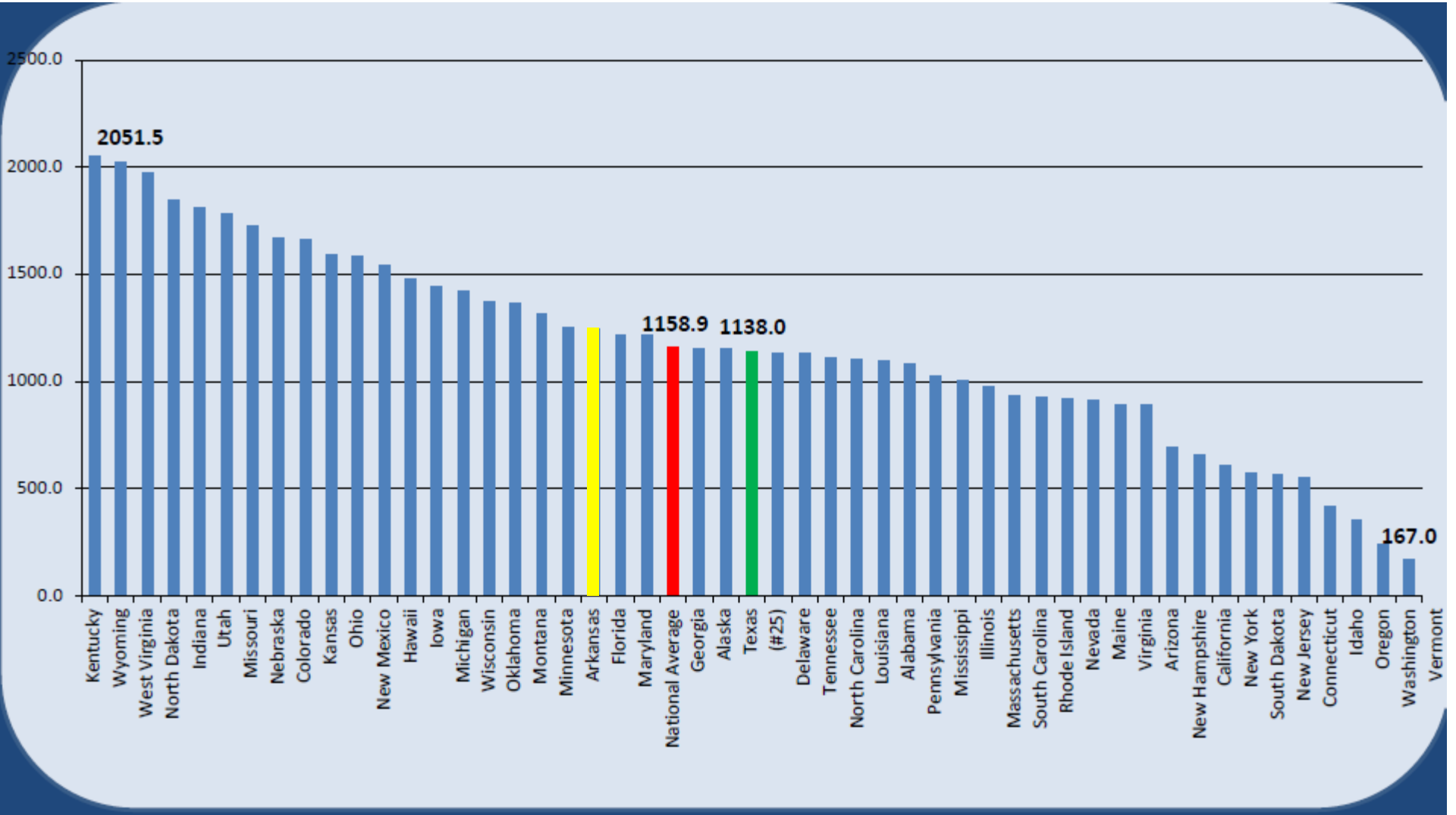
Comparison of Raw State CO_2 Emission Rates



Source: EPA Data File - 2012 Unit-Level Data Using the eGRID Methodology; Includes Vermont, which is not subject to Existing-Source GHG Rule.

Winners versus Losers

The Road to Clean Power Plan Compliance

Short Road

State	2020 emissions rate projections (without CPP)	Final emissions rate-based goal (2030)	Needed progress from 2020 projections
1. Washington	634	983	-55%
2. New Hampshire	636	858	-35%
3. California	712	828	-16%
4. Oregon	760	871	-15%
5. Delaware	861	916	-6%
6. Maine	736	779	-6%
7. Massachusetts	808	824	-2%
8. New York	902	918	-2%
9. Idaho	766	771	-1%
10. Virginia	959	934	3%

Long Road

State	2020 emissions rate projections (without CPP)	Final emissions rate-based goal (2030)	Needed progress from 2020 projections
1. Montana	2,314	1,305	44%
2. Wyoming	2,264	1,299	43%
3. North Dakota	2,184	1,305	40%
4. Wisconsin	1,940	1,176	39%
5. Missouri	1,950	1,272	35%
6. West Virginia	2,021	1,305	35%
7. Indiana	1,882	1,242	34%
8. Utah	1,779	1,179	34%
9. Oklahoma	1,598	1,068	33%
10. Nebraska	1,930	1.926	33%

Needed % reduction in CO_2 emissions rate (lbs/MWh)

-55 to -30 | -29 to -10 | -9% to 0 | 1 to 19 | 20 to 29 | 30 to 34 | 35 to 44

Emissions rate figures are expressed in lbs/MWh and represent a statewide average.
Sources: U.S. EPA

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27% Reduction Beyond BAU

EPA Region 6 States and the Clean Power Plan

Emissions Reductions Needed to Reach Goals

State	2020 emissions rate projections (without CPP)	Final emissions rate-based goal (2030)	Needed progress from 2020 projections
New Mexico	1,225	1,146	6%
Louisiana	1,235	1,121	9%
ARKANSAS	1,551	1,130	27%
Texas	1,515	1,042	31%
Oklahoma	1,598	1,068	33%

Emissions rate figures are expressed in lbs/MWh and represent a statewide average. Source: U.S. EPA

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What will it take to meet 2030 Goal?

- **More natural gas** dispatch and less coal; RTO markets provide more generation options
- **More energy from renewable sources**: wind, solar, hydro, biomass
- **More energy efficiency**; but must quantify
- Still need to ensure **grid reliability**; will need RTOs for enhanced **regional planning**
- RTOs can facilitate **regional trading** to reduce cost of compliance

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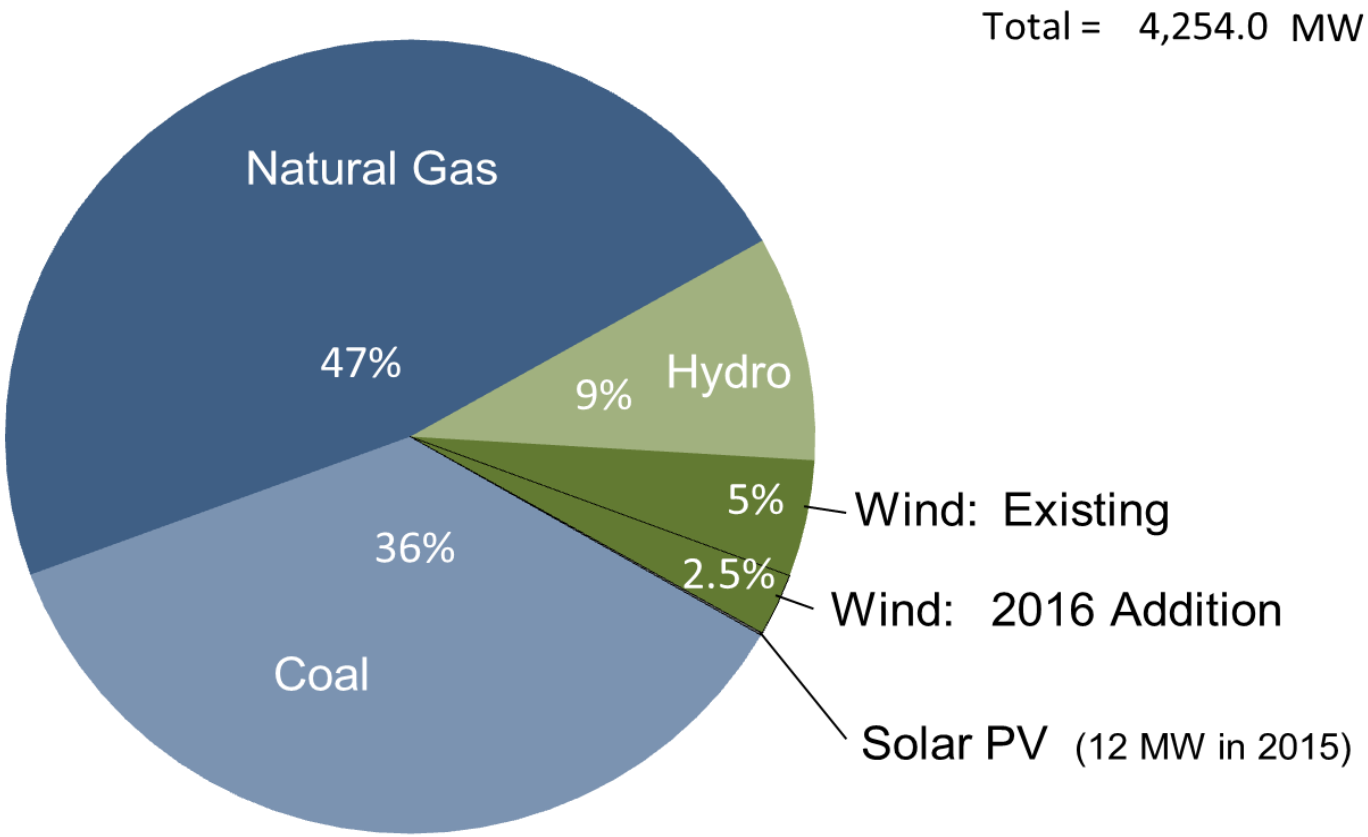
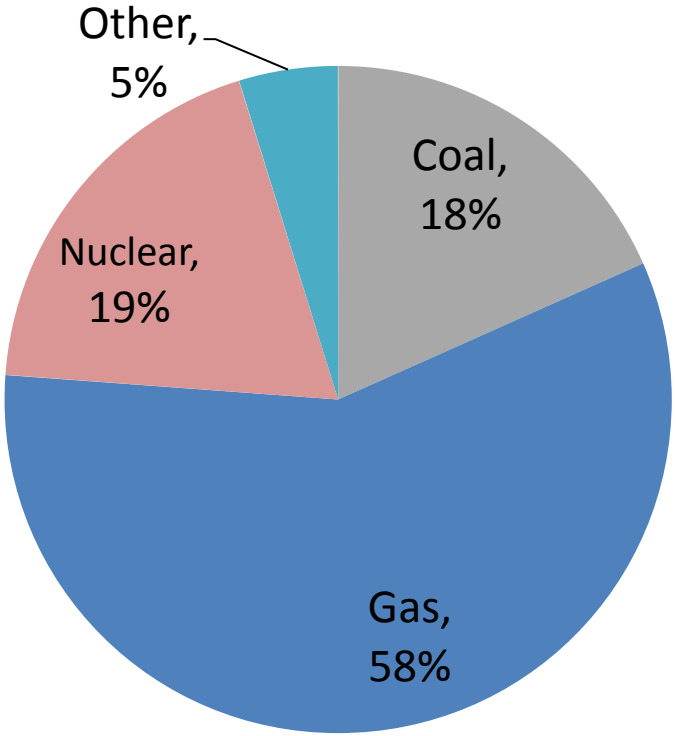
AECC Owned & Purchased Capacity (Installed)

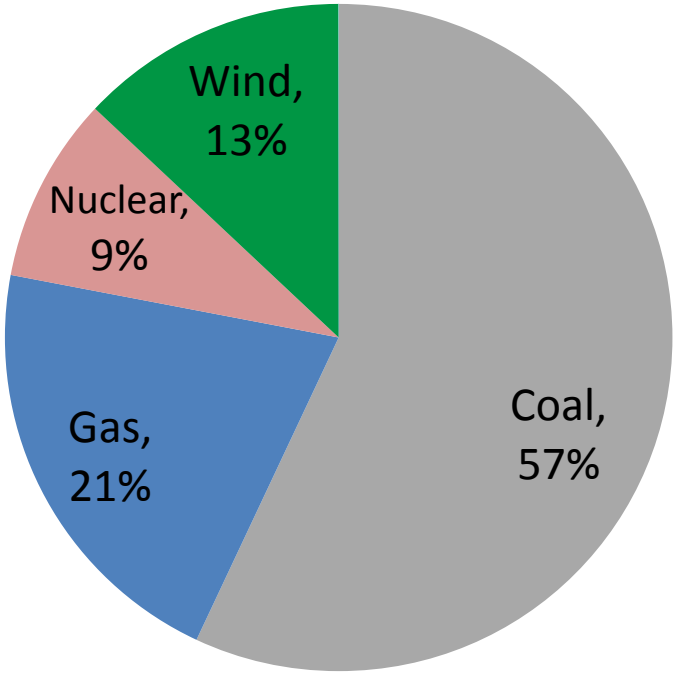


February 2015 Regional Energy Mix

MISO South



SPP



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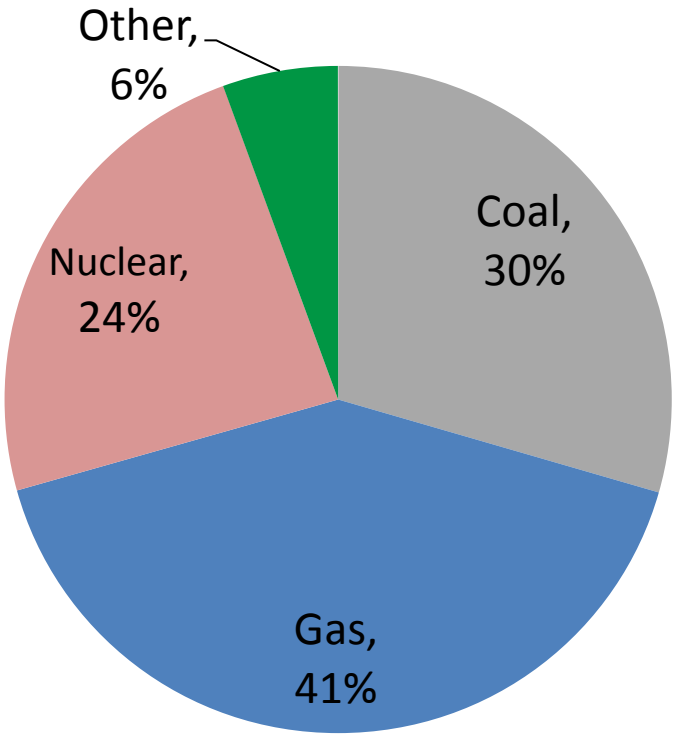
Gas Has Recently Been Displacing Coal

Dispatched Generation Fuel Mix in MISO South

February 2014



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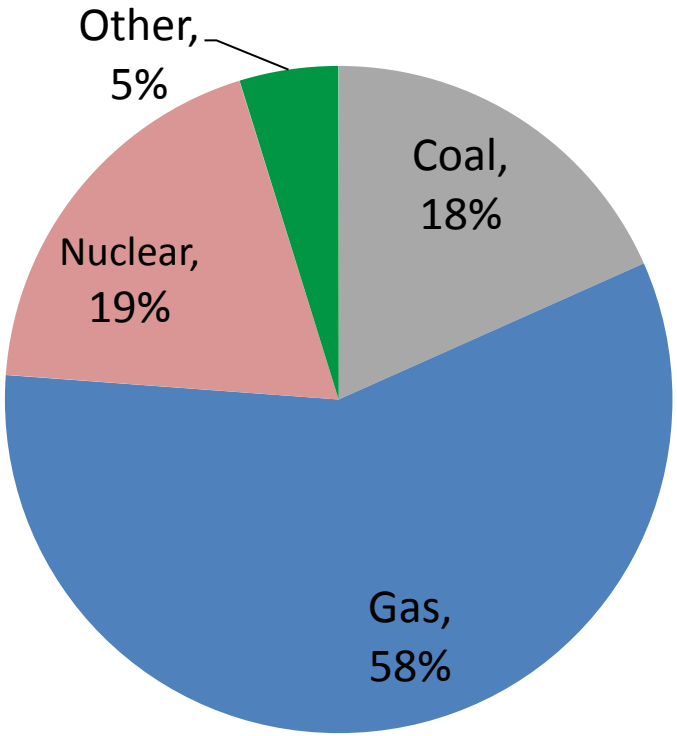

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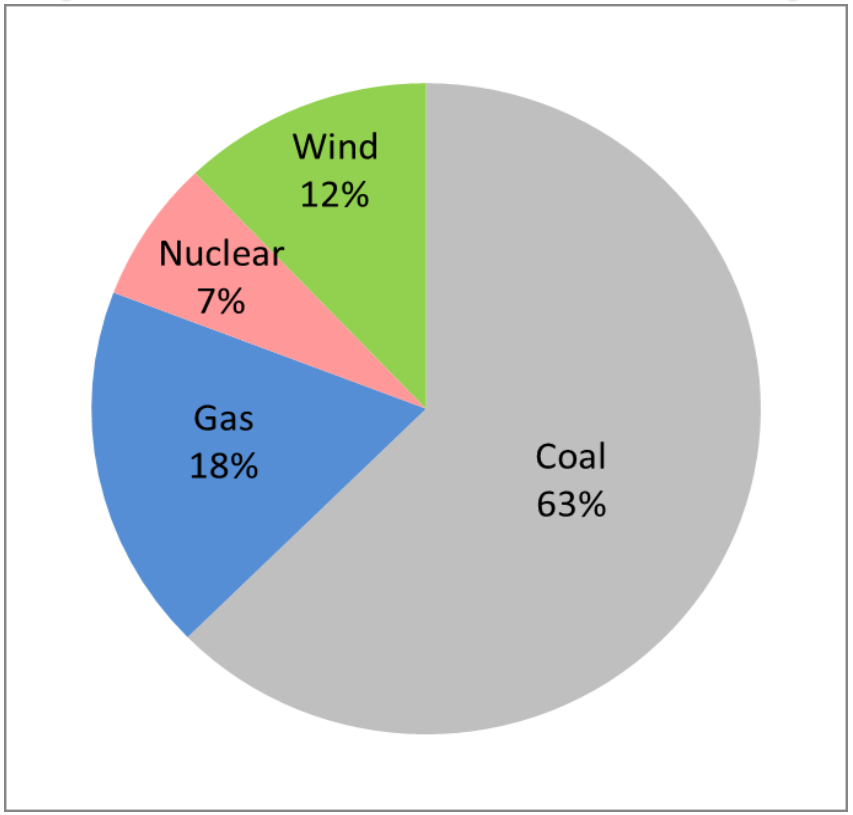
Gas Has Recently Been Displacing Coal

Dispatched Generation Fuel Mix in SPP

2014 Winter Quarter (Dec 2013 - Feb 2014)



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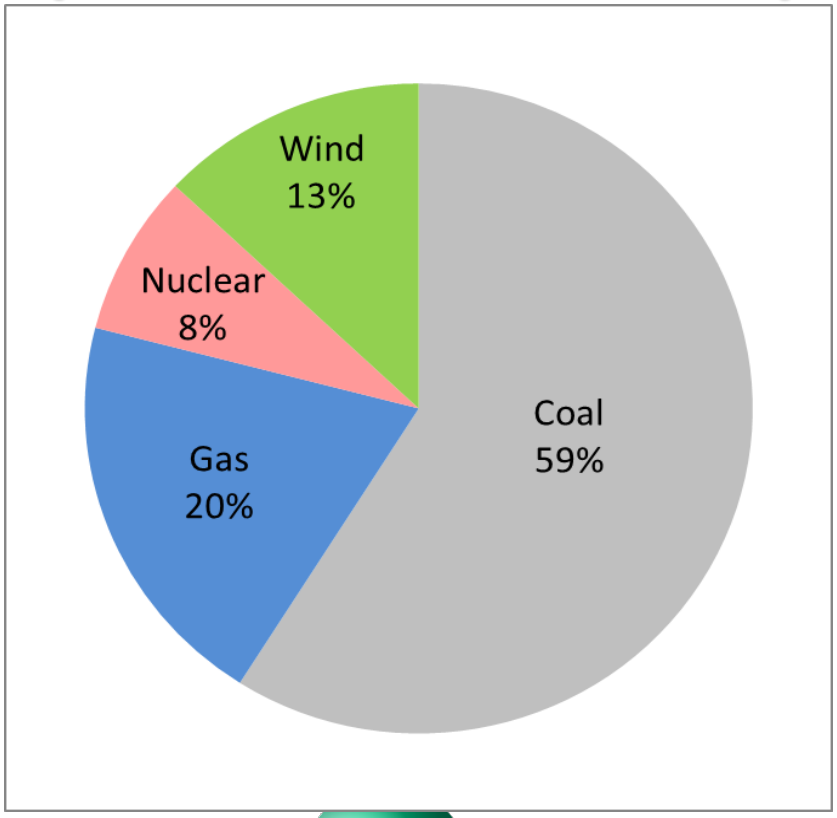

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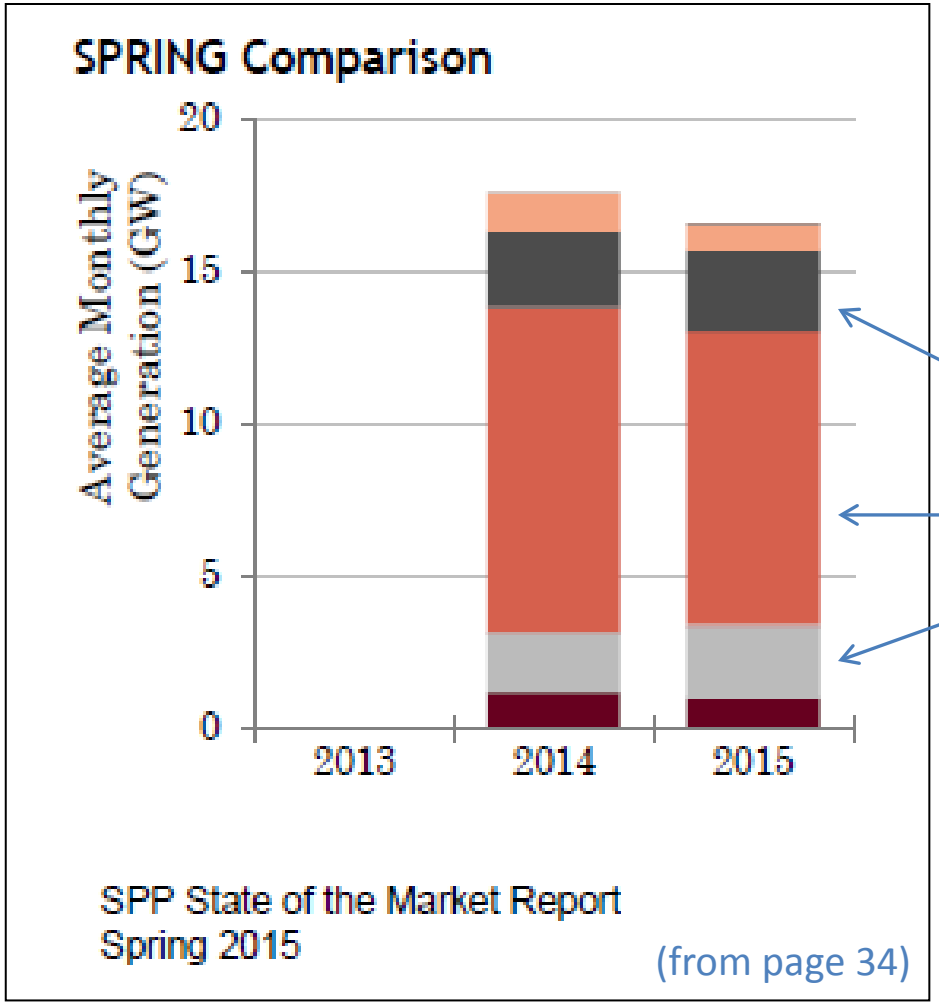
Increases in Gas and Wind during 2015

Dispatched Generation Fuel Mix in SPP



The Spring data is March through May of each year

Gas

Coal

Wind

(day-ahead market cleared energy totals)

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AECC Non-Fossil Energy Sources in Years 2012 and 2017

Type	2012		2017	
	Energy GWH	Percent of Member Energy	Energy GWH	Percent of Member Energy
Hydroelectric	950	6.1 %	950	6.1 %
Wind Powered		--	1,332	8.5 %
Solar		--	20	0.1 %
Biomass		--	35	0.2 %
Total	950	6.1%	2,337	14.9 %

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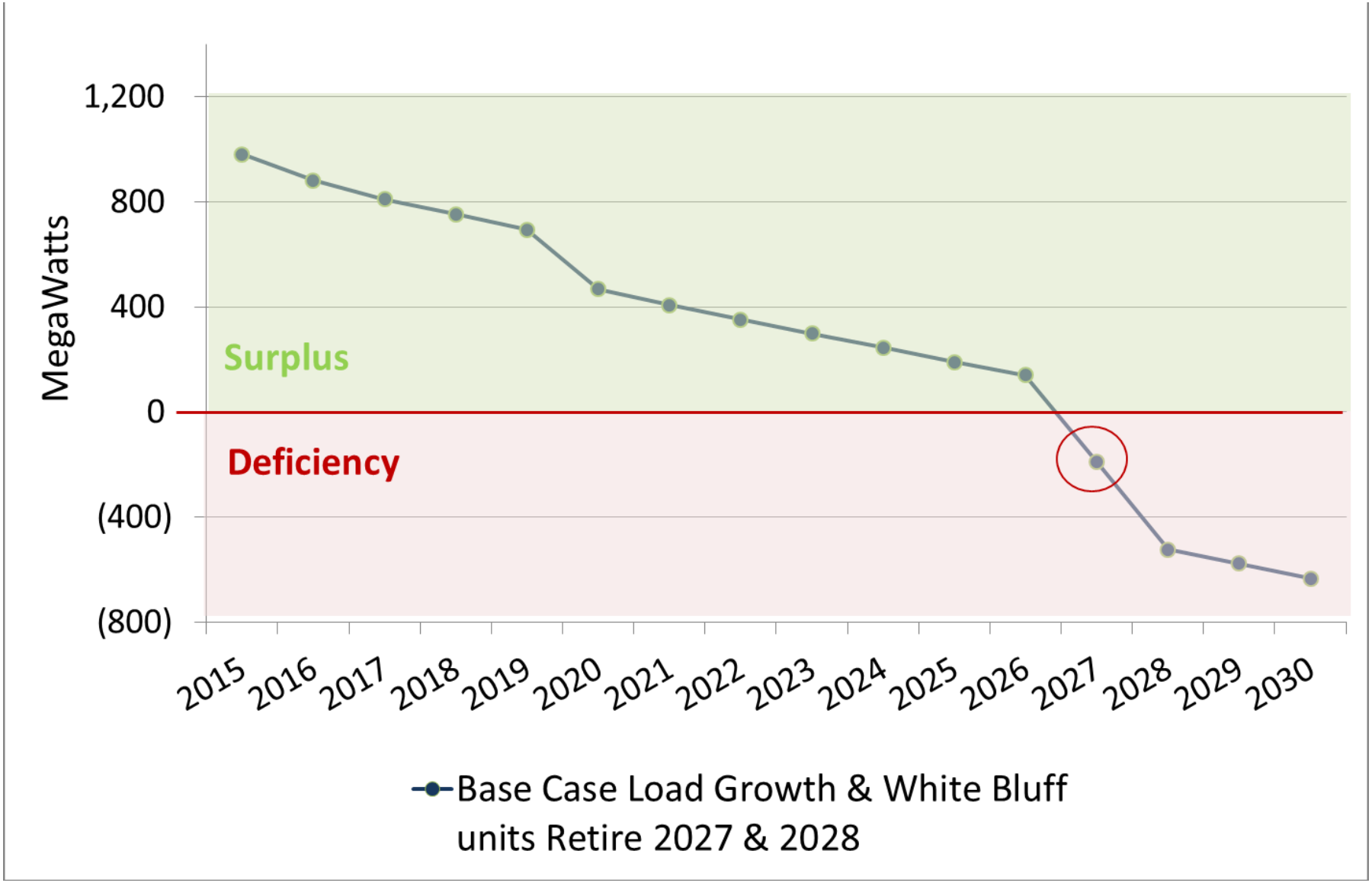
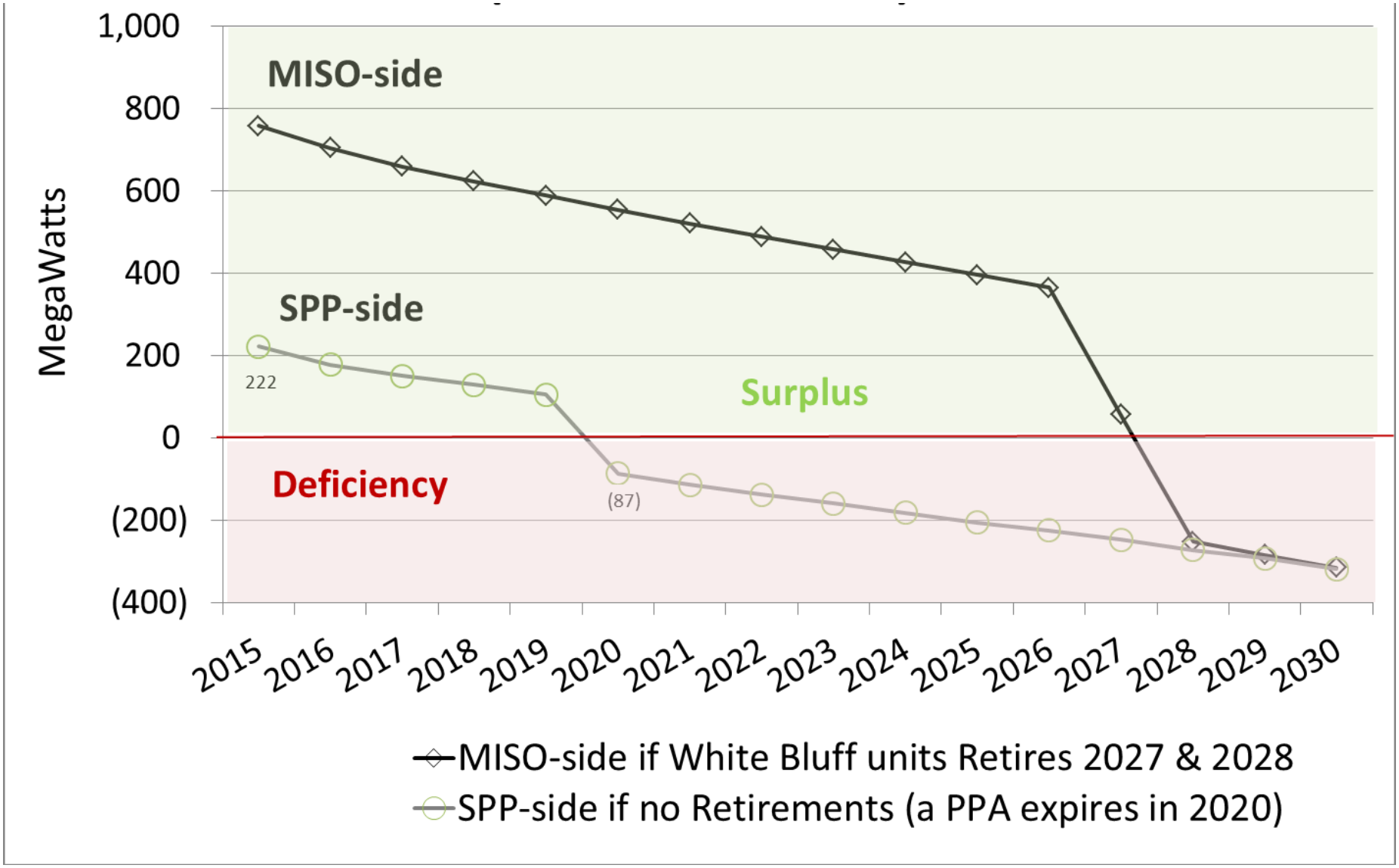
AECC System Generation Capacity



AECC Generation Capacity (within each RTO)



Utility Planning Question

In a carbon-constrained world, what are the options for generation capacity that can provide reliable and affordable power to meet planning criteria?

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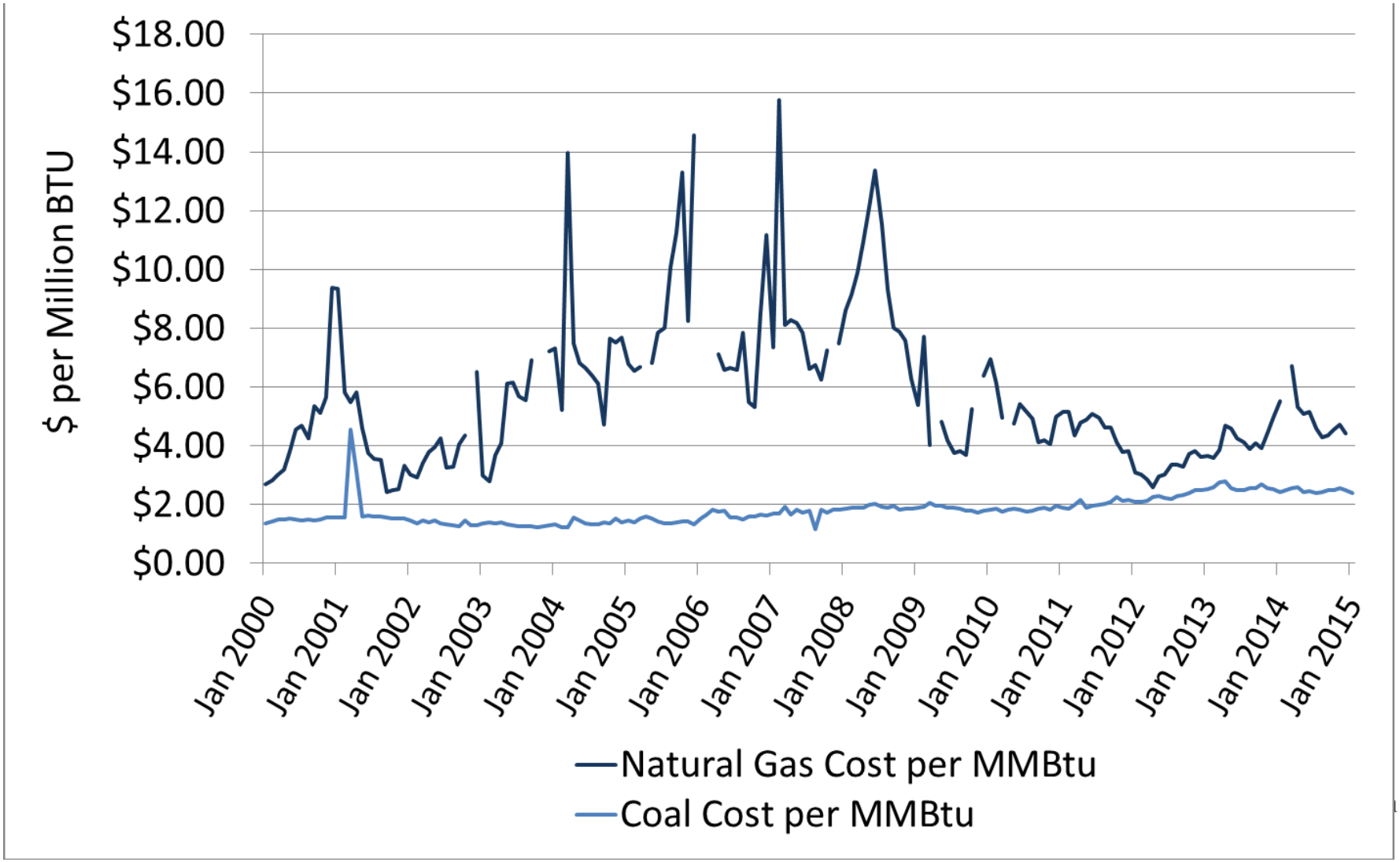
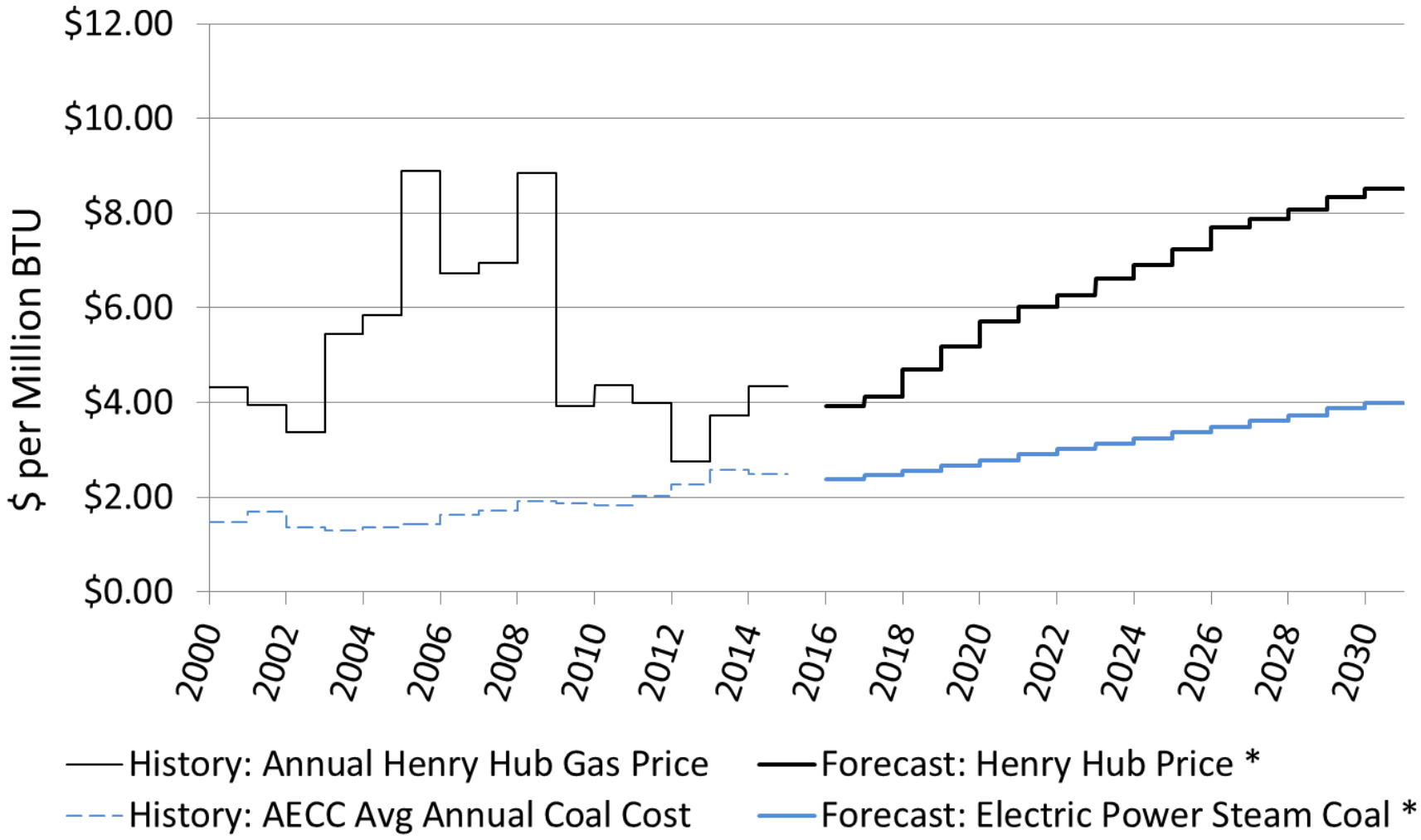
AECC Monthly Average Fuel Costs
Years 2000 thru 2014



Natural Gas & Coal for Electric Power History & Forecast



* Forecasts are from U.S. Energy Information Administration *2015 Annual Energy Outlook*

Potential Future Concerns

- Greater demand for gas increases price
- Higher percentage of gas X higher price = $$$
- Need more gas pipeline infrastructure; that takes years plus additional cost
- May need more transmission to integrate gas
- Will post-2030 reductions decrease gas usage?
- What will the next baseload fuel be? Nuclear?
- Putting all baseload eggs into one basket

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Questions?

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