Implementing the Clean Power Plan in Missouri

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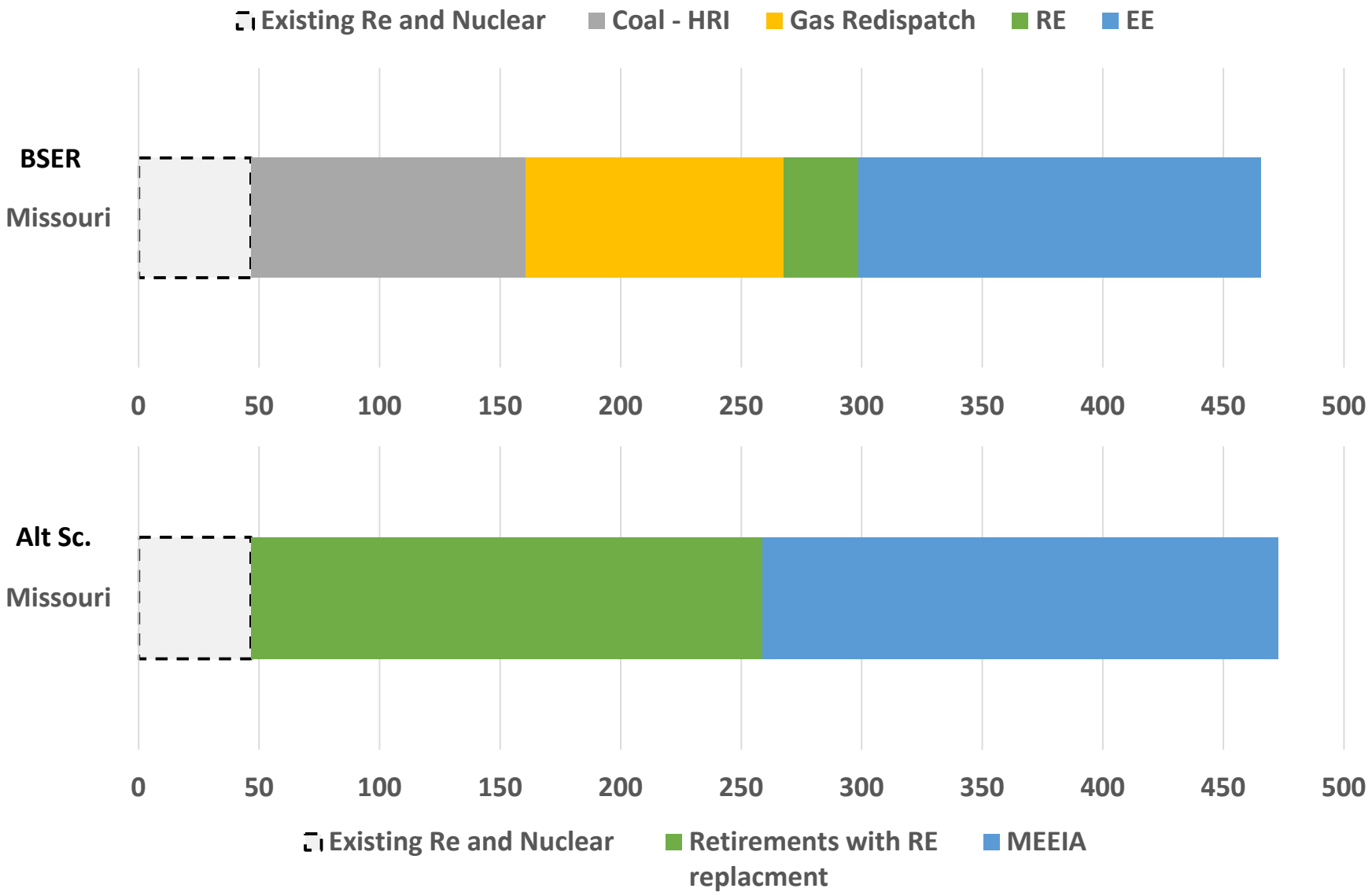
August 18, 2014

Is Missouri's Goal Achievable? Yes!



Building Block 1: Reductions from Coal Plants

Plant Efficiency Improvements:

- 6% is relative efficiency, not absolute.
- Age has no bearing on whether improvements are achievable.
- EPA finds that there are two types of efficiency improvements:
  - Reduce heat rate variability with best practices. 1.6-6.7% with average *4%*
  - Equipment upgrades. 4% potential, cautiously adopted *2%.*

In Sum: EPA found that **10.7% improvements could be achieved**, screening out most expensive options. Settled on 6%

Improving Missouri's Plant Efficiencies is achievable

Plant	Unit	Nameplate Capacity (MW)	First Year of Operation	Coal Heat Rate (MMBtu/MWh)	Capacity Factor (2013-2042)
New Madrid	1	650	1972	9.90	70%
Thomas Hill	3	738	1982	10.14	70%
Columbia	5	16.5	1957	13.35	9%
Asbury	1	212.8	1970	11.03	62%
Blue Valley	ST1	25	1958	17.13	20%
Missouri City	1	23	1954	18.87	10%
Hawthorn	5	594.3	1969	10.36	73%
Montrose	3	188	1964	11.04	54%
Iatan	1	726	1980	9.44	73%
Sikeston Power Station	1	261	1981	10.48	75%
James River Power Station	5	105	1970	11.84	51%
John Twitty Energy Center	ST2	300	2011	10.15	49%
Labadie	4	621	1973	10.23	80%
Meramec	4	359	1961	11.55	64%
Sioux	2	549.7	1968	10.32	56%
Rush Island	1	621	1976	10.00	74%
Sibley	3	419	1969	10.43	55%
Lake Road	4	90	1966	20.54	54%
Sources		EIA Form 860 2012	EIA Form 860 2012	EIA 923 2010-2012	

Next Step: Identifying Past & Future Improvements.

PSC Asks: "By plant, list (and describe) the **heat rate improvements necessary** to achieve a 6% improvement from most cost-effective to least cost-effective. Include the cost (both O&M) and capital) for each improvement and the expected heat rate increase.

PSC Asks: "Please identify **projects that you have already implemented** or started that should be considered toward satisfying the various EPA building blocks."

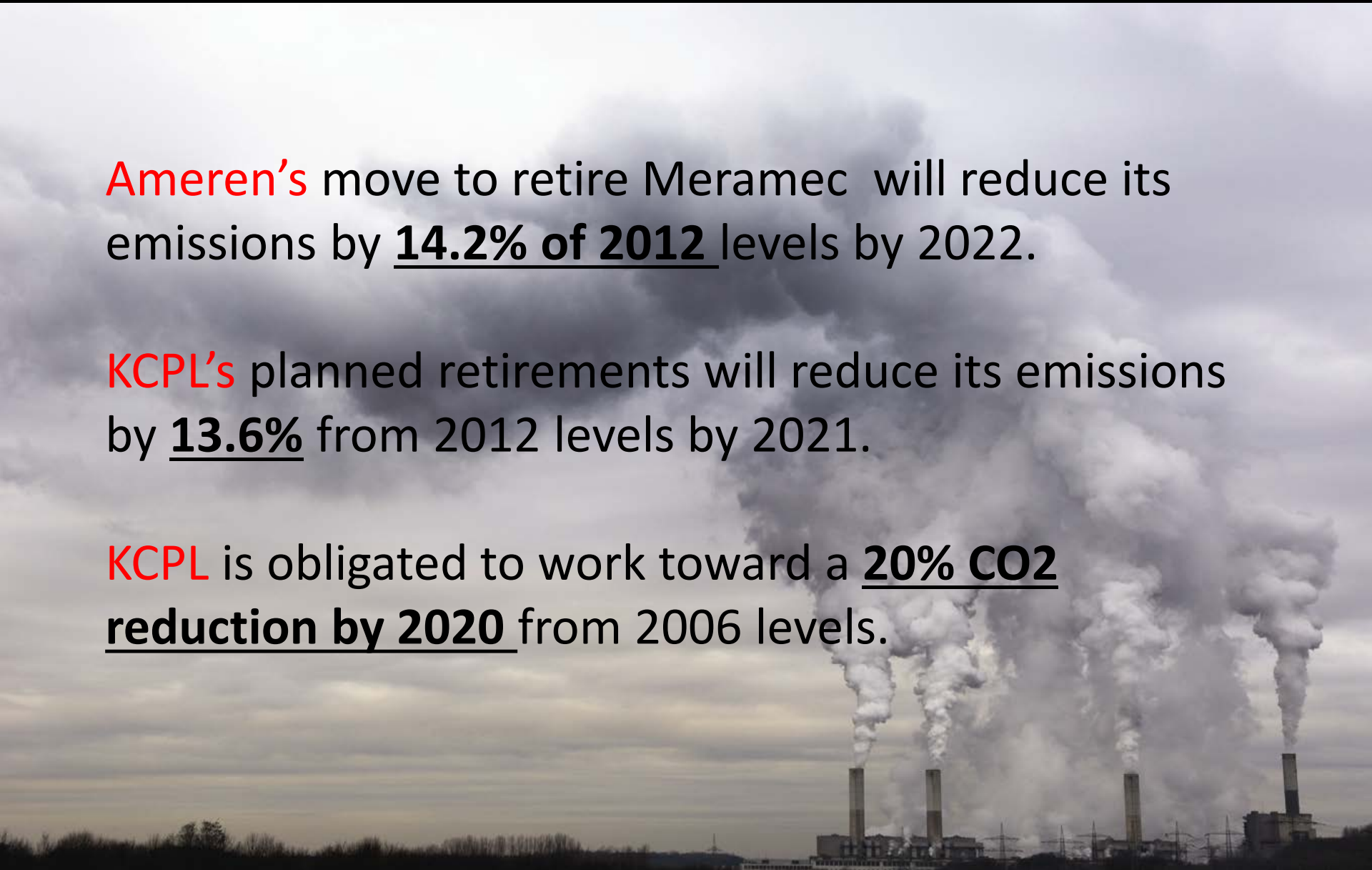
PSC Asks: "Please identify any **best practices** that you have already implemented to comply with other environmental regulations, and indicate if those best practices can be considered toward satisfying the various EPA building blocks.

Next Step: Sierra Club urges the PSC to combine the spirit of these questions to ask operators to indicate clearly the efficiency upgrades already done, and how effective they were in increasing plant efficiency.

Missouri's Operators Planning Phase Outs

Owner	Plant Name	Size	2012 Carbon Emissions (Metric Tons Per Year)	Plan to Retire
AECI	Chamois	59MW	309,116	Already retired
AECI	Thomas Hill 1	180MW	1,309,927	Presented to Missouri Public Service Commission as possible compliance strategy
Ameren	Meramec	923MW	4,230,823	Board vote and PSC filing – July 2014
City of Columbia	Municipal Power Plant	39MW	61,428	Draft review of energy portfolio for City Council
City Utilities	James River 1-3	88MW	105,123	City approved conversion to gas
Independence	Blue Valley	115MW	50,056	City resolution passed 7/21/14 to stop burning coal
KCPL GMO	Sibley 1-2	105MW	256,565	2019 retirement according to 2014 Integrated Resource Plan Annual Update
KCPL	Montrose	564MW	1,974,224	Unit 1 to retire in 2016 and Units 2 and 3 in 2021, according to 2014 Integrated Resource Plan Annual Update
KCPL GMO	Lake Road	90MW	391,921	To retire in 2019 according to 2014 Integrated Resource Plan Annual Update
		TOTAL	8,689,184	

Significant Steps to Reduce CO2 are Already Underway

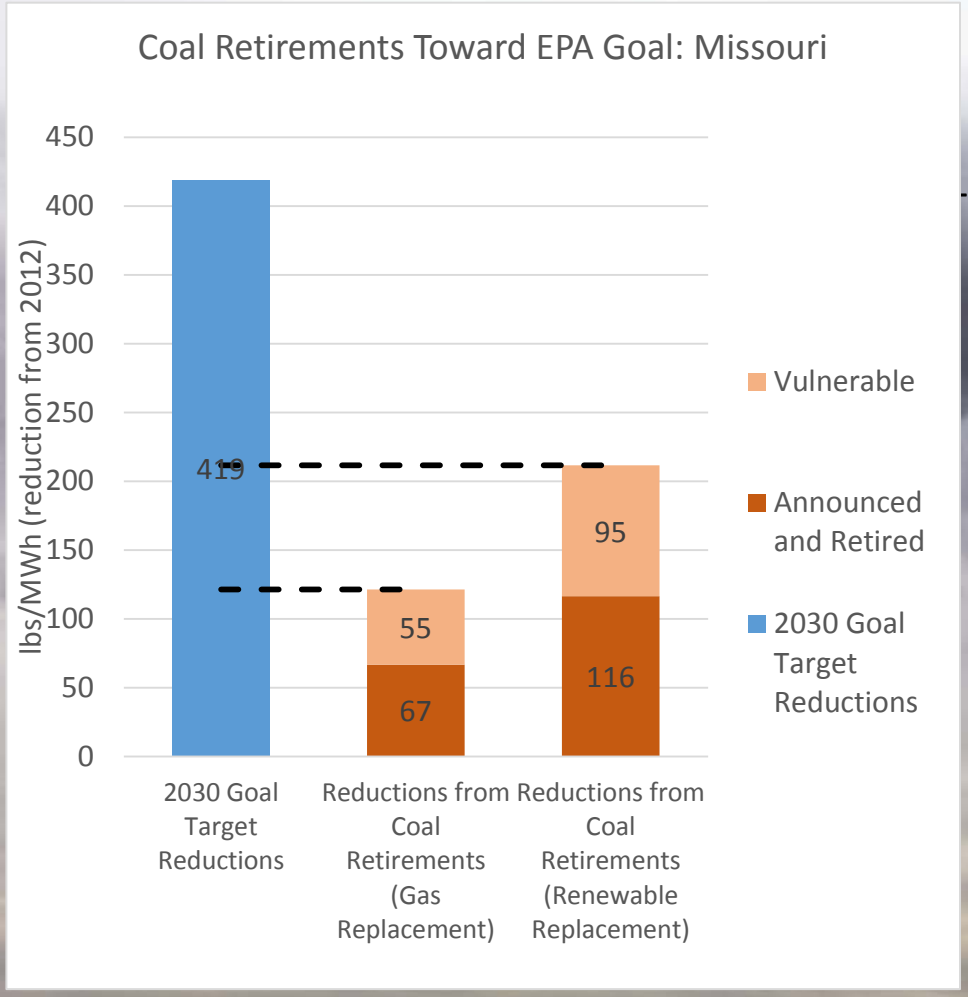


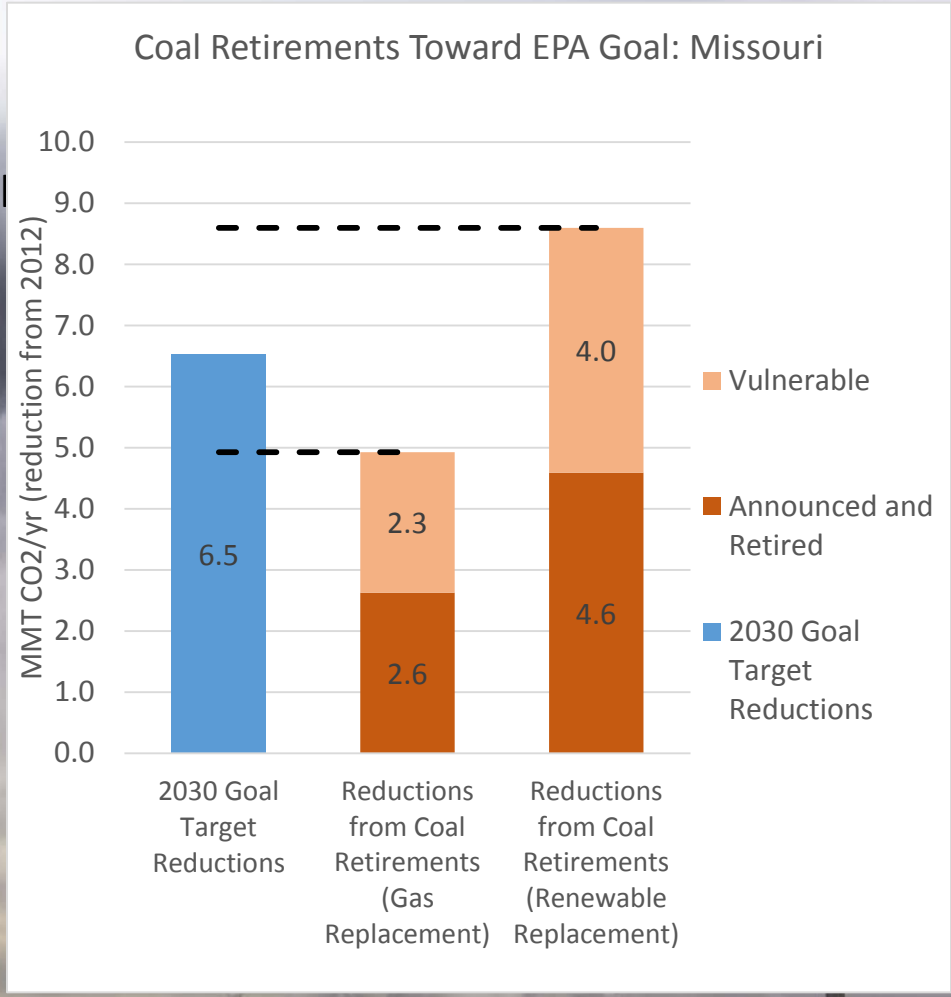
Ameren's move to retire Meramec will reduce its emissions by **14.2% of 2012** levels by 2022.

KCPL's planned retirements will reduce its emissions by **13.6%** from 2012 levels by 2021.

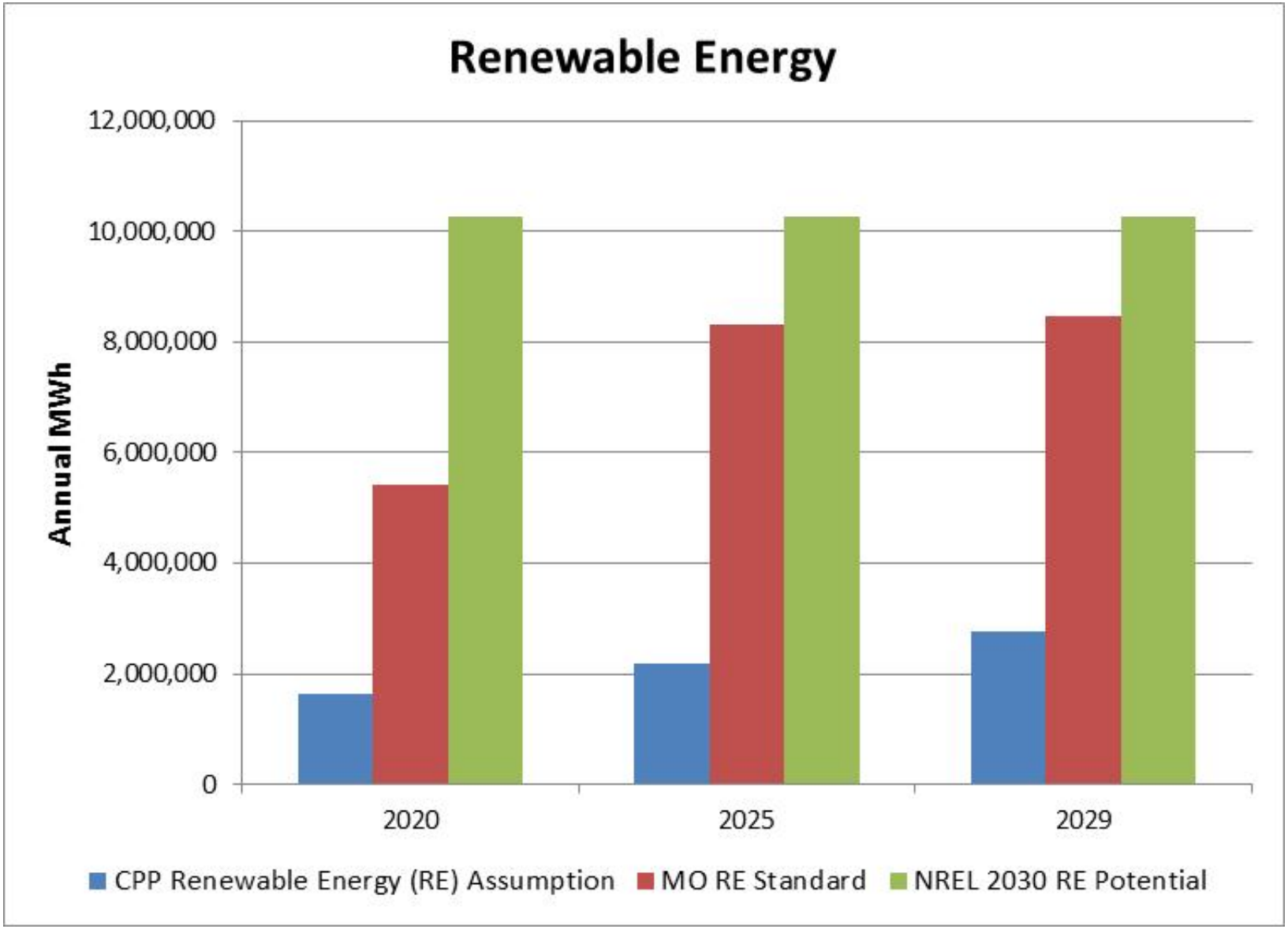
KCPL is obligated to work toward a **20% CO2 reduction by 2020** from 2006 levels.

PSC: "Can Missouri Achieve its Target?" Retirements Slash Carbon





Building Block 3: Missouri's RES Helps Achieve Compliance



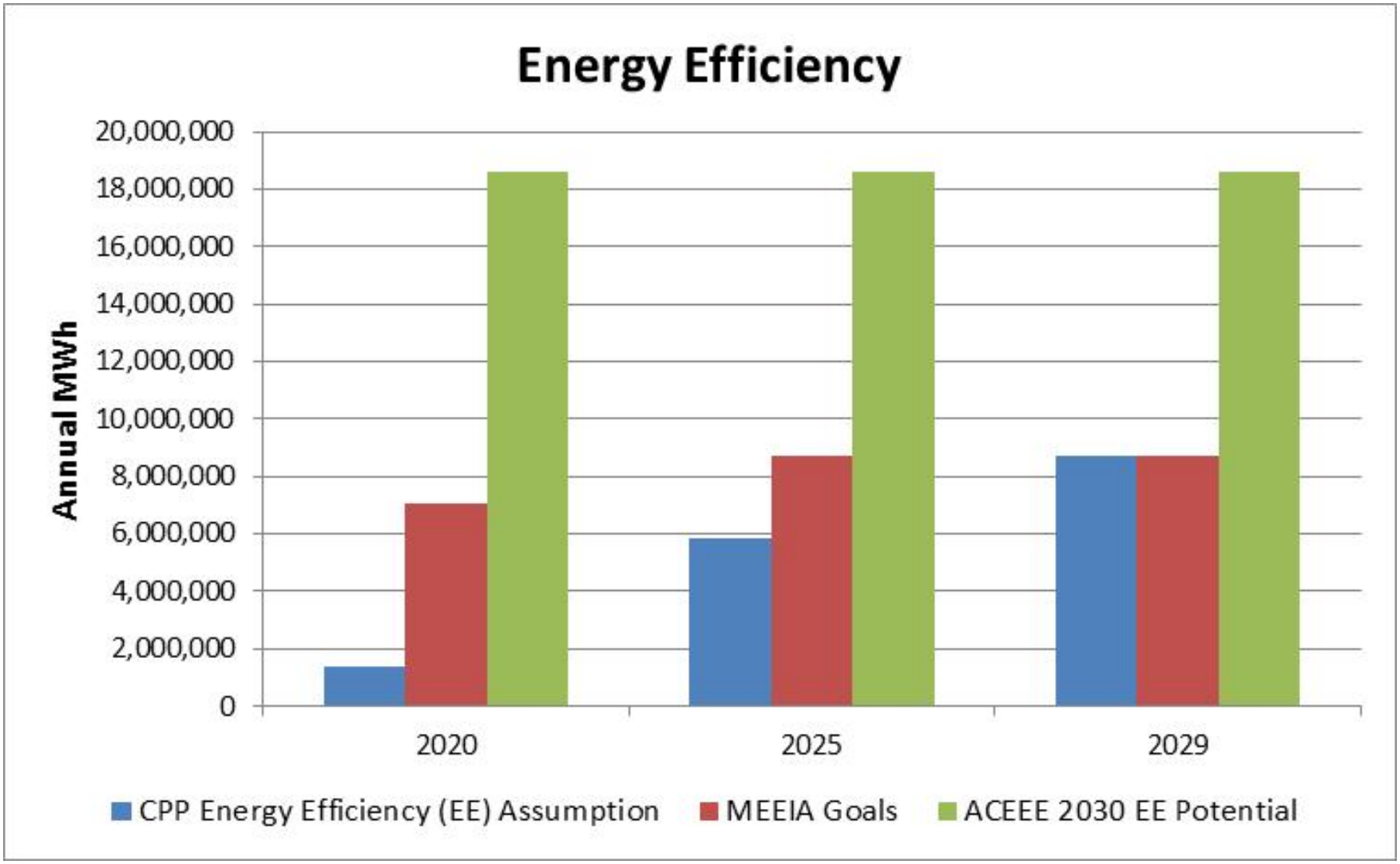
Building Block 3: Adding Clean Energy vs. B.A.U.

"Business as usual"= $4.7 billion to $12.6 billion

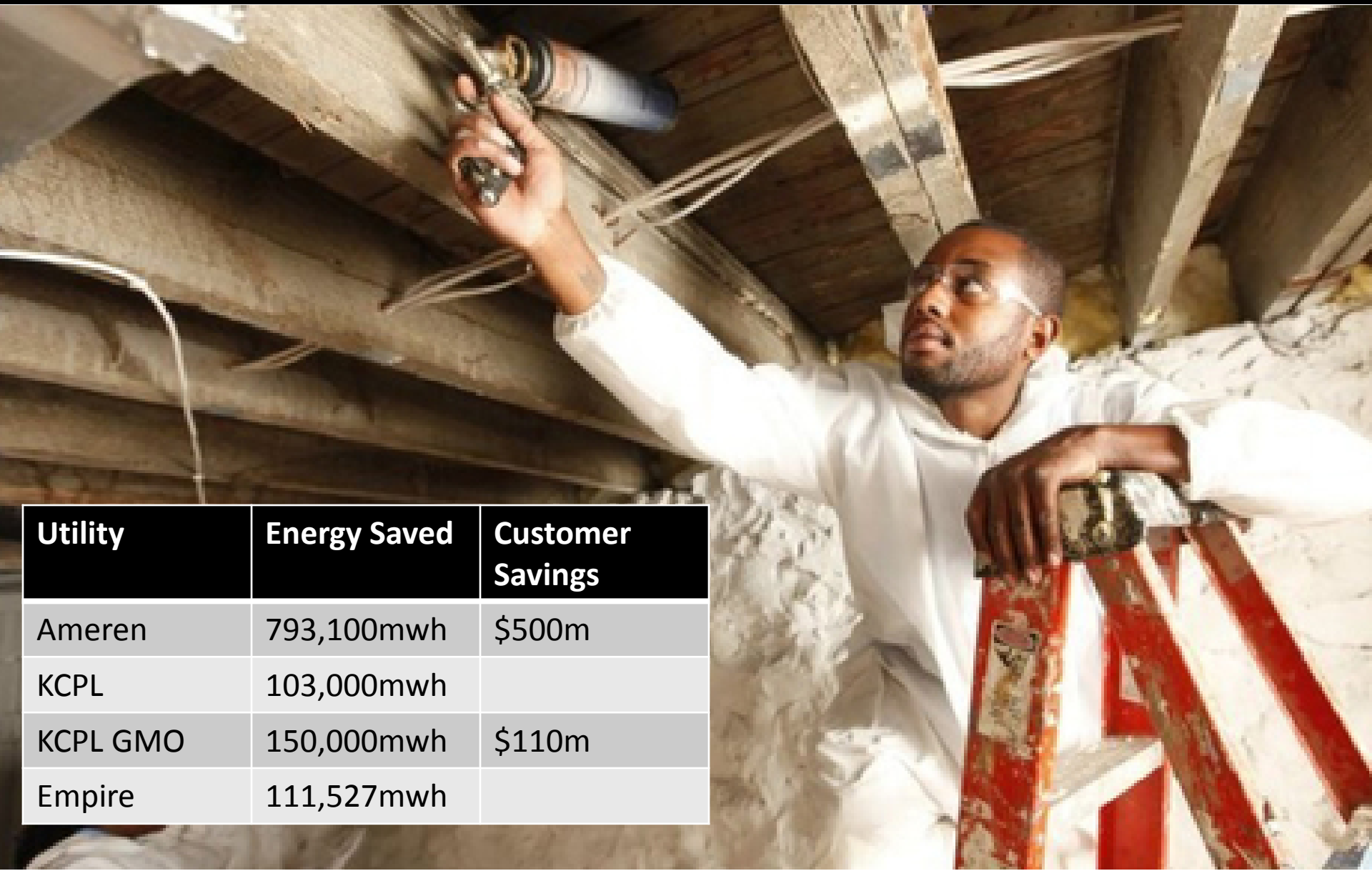
Cost to upgrade the state's coal-fired power plants. Compare that reality to low-carbon path, Sierra Club finds that a smart State Implementation Plan can save money.

KCPL, Empire, AECI have demonstrated leadership on wind. Moreover, Columbia and Independence are increasing clean energy, along with AECI, because it is cost effective,. Regional utilities are demonstrating cost-saving potential. *Lincoln, NE* is saving $160 million with 100mw; *Xcel* is saving $220 million with new wind; *MidAmerican* will achieve 40% wind and continue to save hundreds of millions.

Building Block 4: Relying on MEEIA to Deploy EE



Building Block 4: Energy Efficiency Successes



Utility	Energy Saved	Customer Savings
Ameren	793,100mwh	$500m
KCPL	103,000mwh	
KCPL GMO	150,000mwh	$110m
Empire	111,527mwh	

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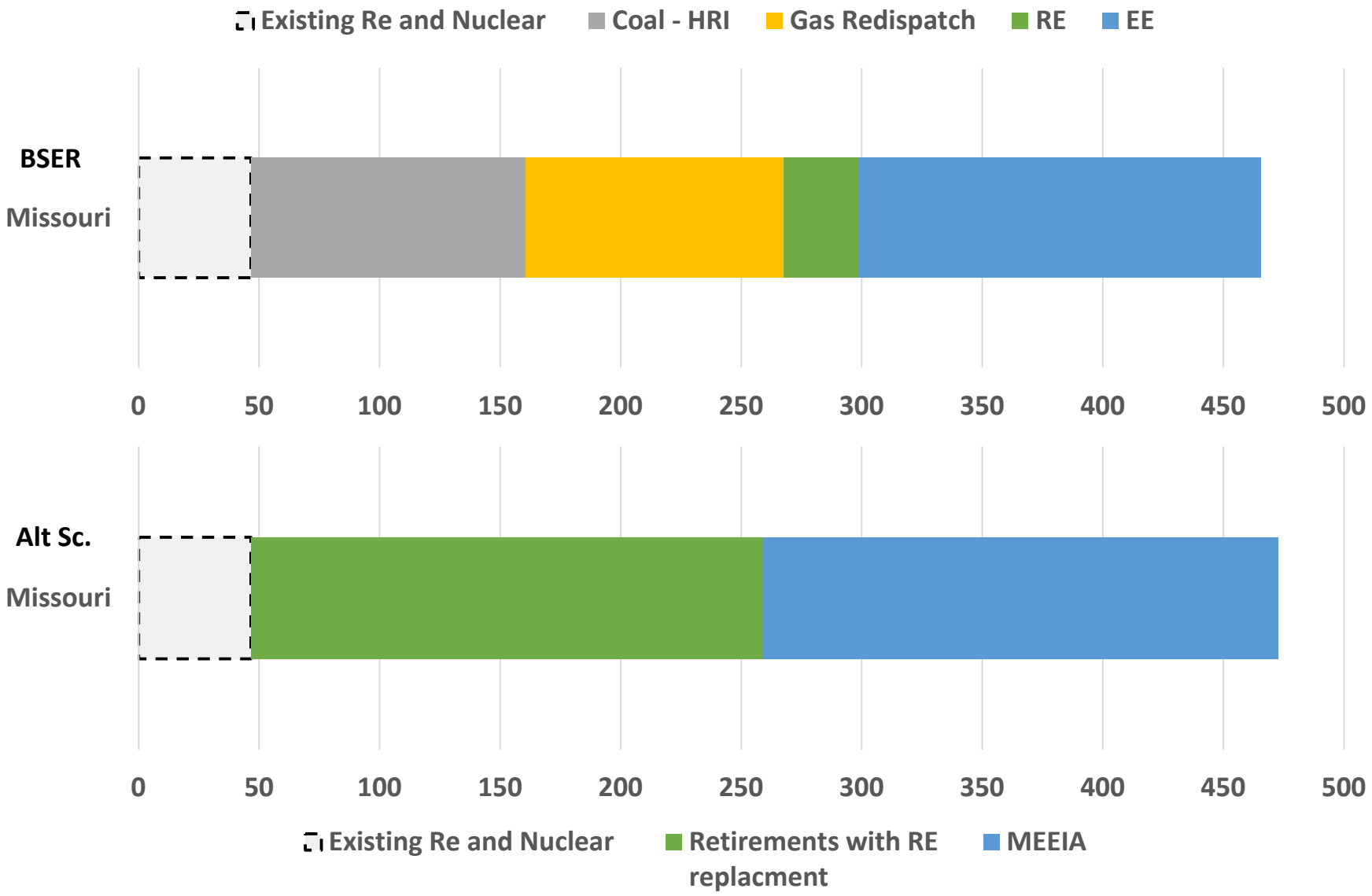
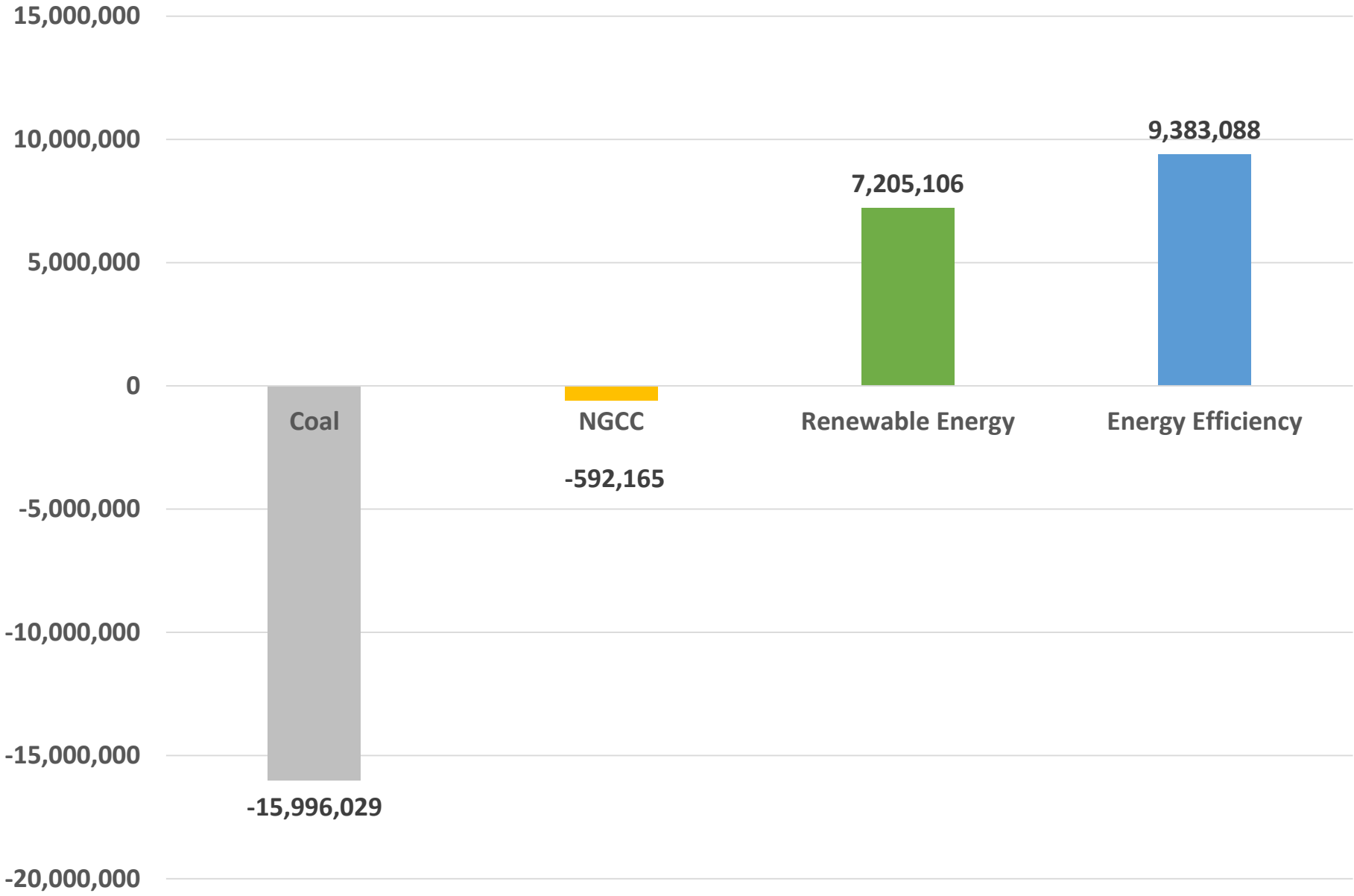


Changes in generation



Role of the Public Service Commission

1. Engage with fellow state regulators
2. Engage with other states
3. Engage and strengthen relationships with EPA regional offices
4. Initiate or deepen engagement with the ISO/RTOs
5. Evaluate the state's EM&V protocols
6. Update or conduct maximum potential studies for EE and RE
7. Determine if additional value can be obtained from state EE and RE programs
8. Incorporate GHGs in relevant planning and regulatory processes
9. Consider the staging of actions to reduce GHG emissions
10. Eliminate "silos" that segregate multiple pollutants and impacts

"Preparing for 111(d): 10 Steps Regulators Can Take Now," Ken Colburn and Christopher James. Regulatory Assistance Project.

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