EPA's Existing Source Performance Standards for GHGs

Proposed Rule of June 2, 2014

Presentation to

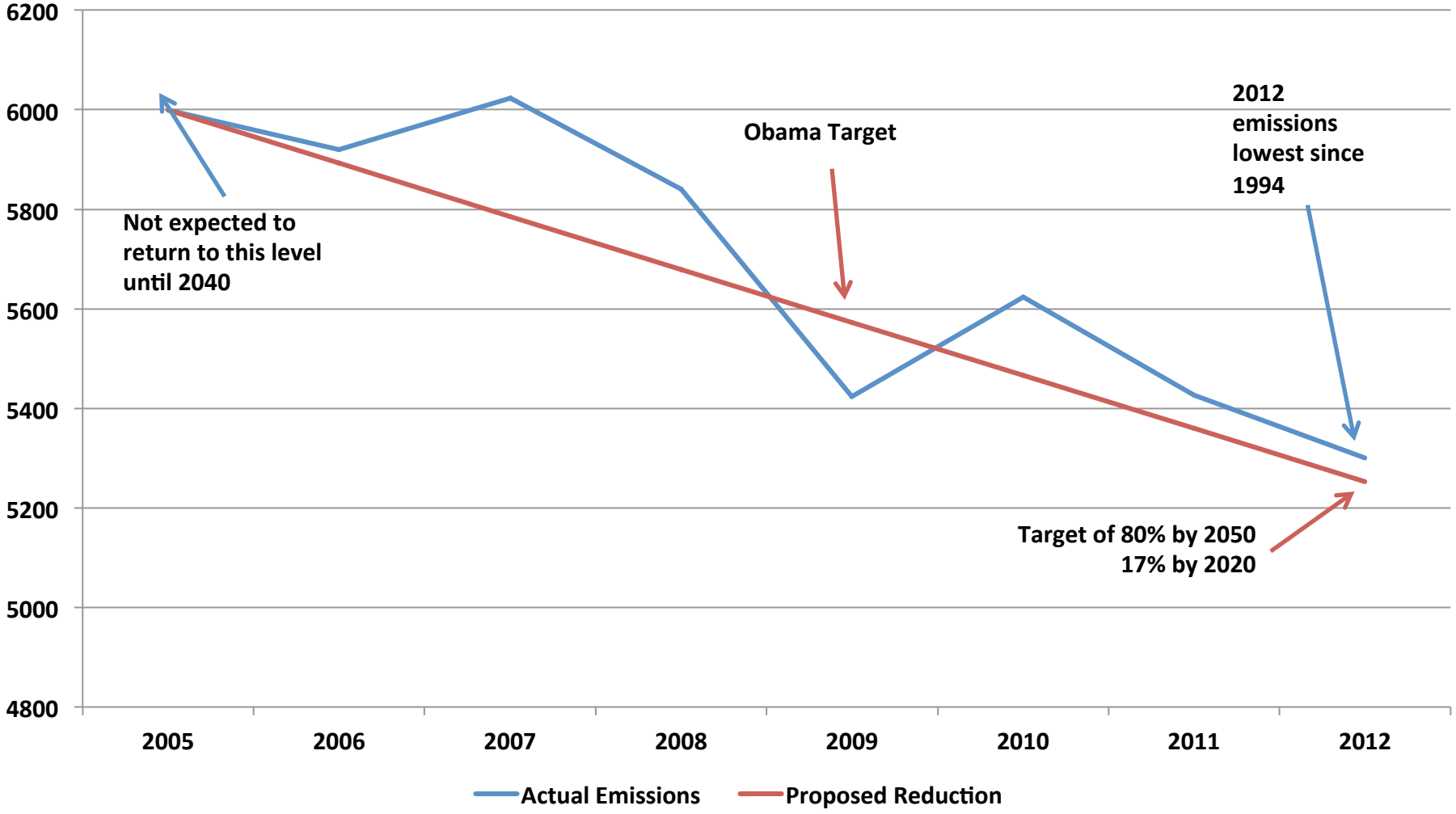
Southern States Energy Board

July 26, 2014

Proposed ESPS

- EPA calls it their Clean Power Plan to reduce "carbon pollution"
- Goal is to reduce GHG emissions by 30% from 2005 levels by 2030
- Reference: 2005 was peak for US emissions
- Emissions in 2012 were well below 2005 levels due to economic downturn

U.S. CO2 Emissions from Energy Consumption
Million Metric Tons



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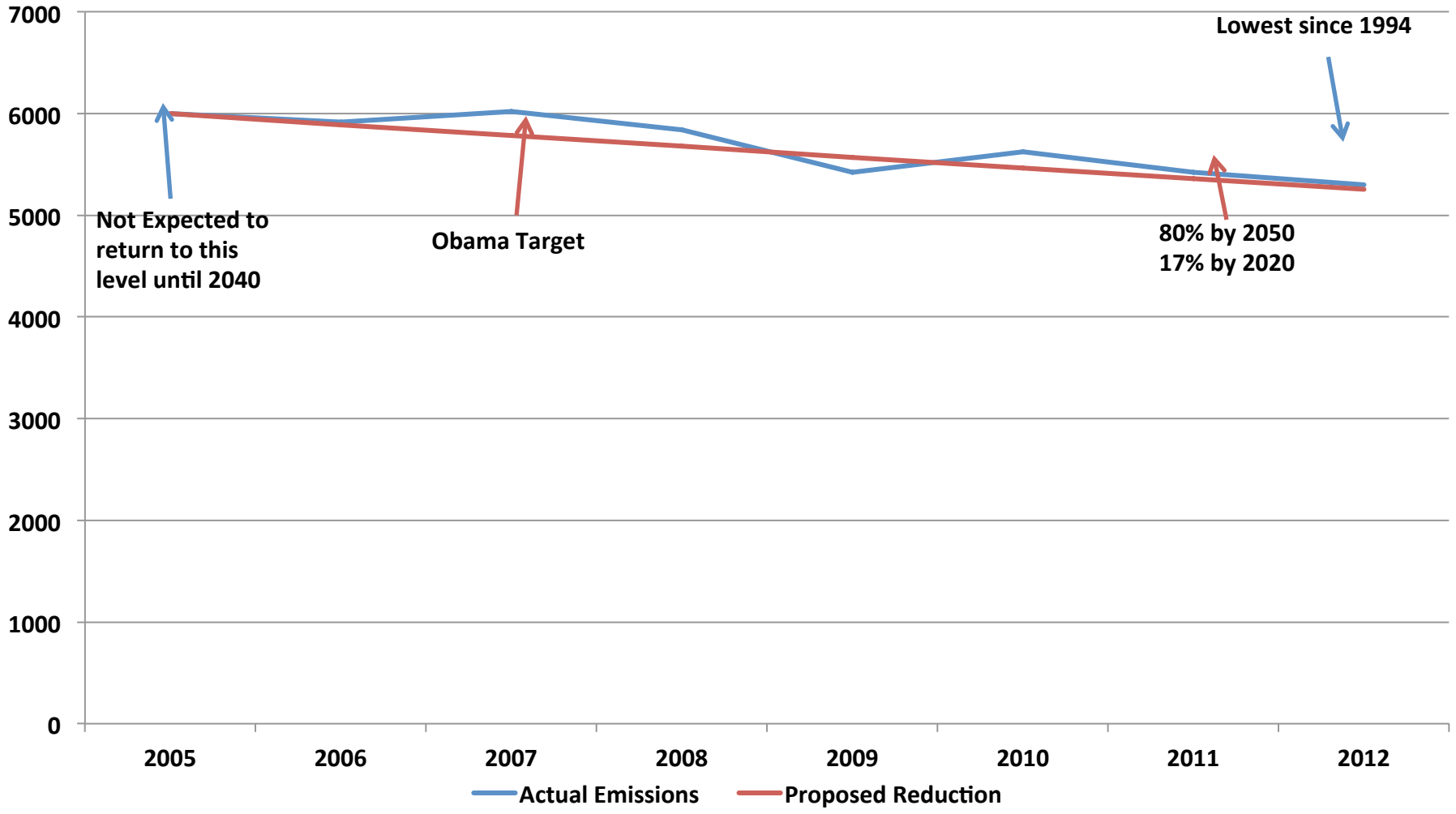


EPA's take on the new rule:

- **Will REDUCE electric bills by 8% in 2030.**
- **No impact to reliability**
- **Boon to the economy**
- **Spur innovation**
- **EPA will *work with states* to develop plans**
- **Allows states *flexibility* and leadership**
- **Takes advantage of a wide range of energy sources**
- **Many *opportunities* to make reductions**

EPA Rule

- **Administration says the new regulations will *prevent* 100,000 asthma attacks and 2,100 heart attacks in their first year of being implemented.**
- **From the *2009 Endangerment Finding*:**

"Ambient concentrations of *carbon dioxide and the other greenhouse gases*, whether at current levels of at projected ambient levels under scenarios of high emissions growth over time, *do not cause direct adverse health effects such as respiratory or toxic effects."*

Rule's Authority:

- **Section 111 (d) of the Clean Air Act – an "obscure" section of the Act to deal with miscellaneous pollutants that weren't specifically covered elsewhere**
- **Historically used to regulate non-conventional pollutants that "cause, or contribute significantly to air pollution that may reasonably be anticipated to endanger public health or welfare"**

Section 111(d) Process

Step 1

- EPA to establish "guidelines" to help States develop a plan for setting performance standards to implement Section 111(d)
- To include info on health, cost, and environmental effects
- 120-day comment period ends October 16, 2014
- Final rule expected June 2015

Step 2

- States to establish performance standards and implementation/ enforcement mechanisms
- In this case, EPA set targets; up to states how to achieve them
- States must draft and submit plans to EPA for approval
- Plans due June 30, 2016 (or 2017 if state needs more time)
- Compliance timeframe: 2020 - 2030

"Best System of Emissions Reductions"

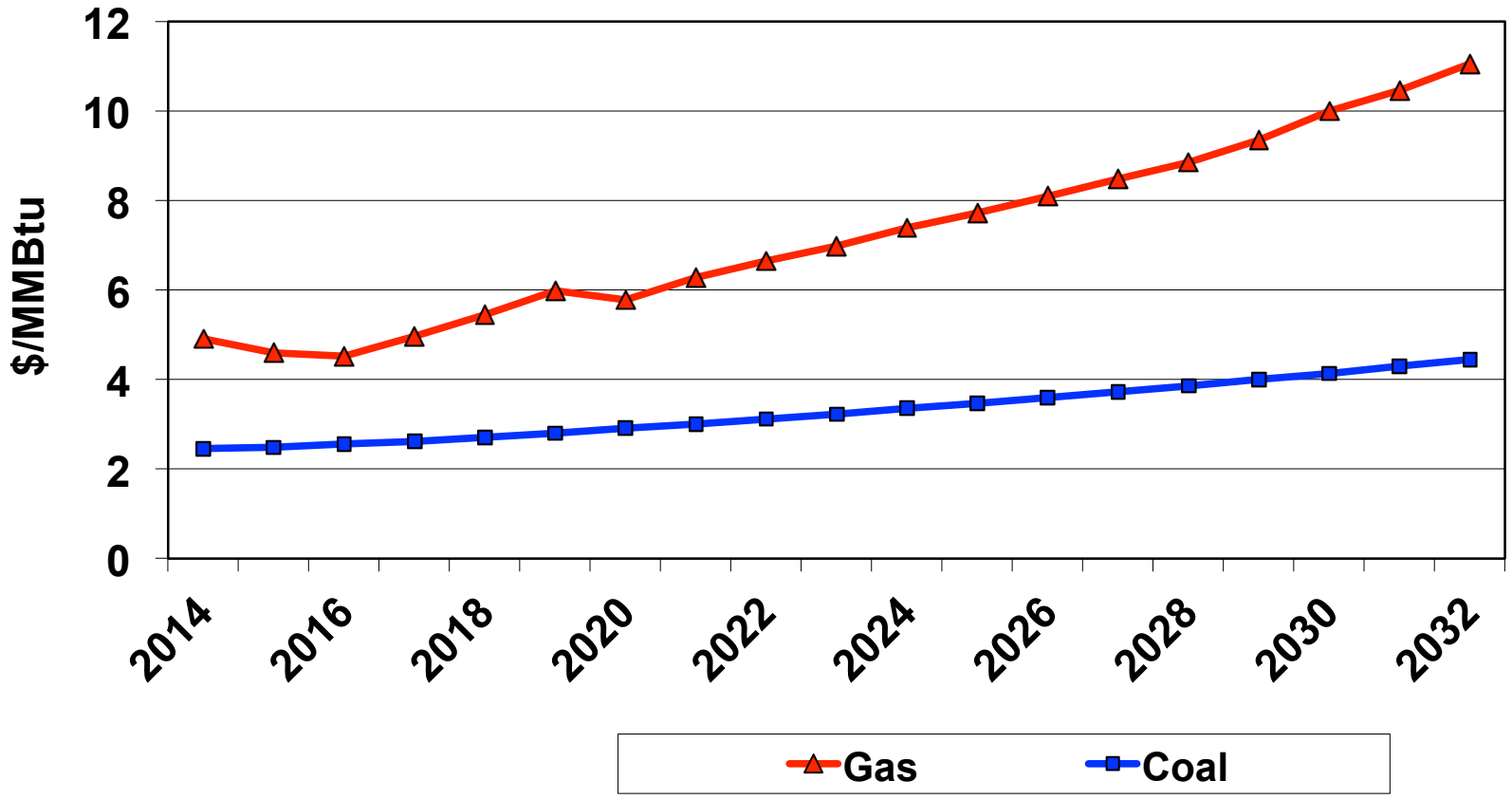
- EPA must develop "guideline documents" that identify the Best System of Emission Reductions (BSER) for the covered pollutant
- BSER must be "adequately demonstrated"
- BSER to consider cost, energy requirements, energy requirements, and environmental impacts
- States must then develop plans to meet BSER
- States have 1 to 2 years to develop plans
- States are permitted to take into consideration the remaining useful life of an existing source

EPA Approach:
Set Aggressive Targets

Set a composite "carbon intensity" emission rate *for each state* based on what EPA thinks each state *could do* to reduce GHG emissions:

- **Assume every fossil unit can make a 6% (?) improvement in heat rate efficiency ("Block 1")**
- **Assume every "under-utilized" NGCC plant can be ramped up to 70% capacity factor – backing off coal generation equal to the ramp up. ("Block 2")**
- **Add increasing renewables starting in 2020 ("Block 3")**
- **Increase DSM/EE of 1.5% per year in 2020 ("Block 4")**

Fuel Price Forecasts



Gas forecast after 2018 based on the forecast from the Energy Information Administration

State plans have a "suite of opportunities" to meet EPA's targets:

- Efficiency upgrades at power plants
- Environmental dispatch (ramp down coal units, ramp up gas units)
- Fuel-switching/ co-firing with natural gas or biomass (maybe)
- Carbon Capture and Storage/Utilization
- Retire coal
- Add renewable energy
- Increase DSM energy efficiency
- Encourage more combined heat and power facilities
- Reduce electric transmission losses
- Partner with other states to set up trading (legal issues)

EPA Approach: AR Targets

- **Repeat: Set a composite "carbon intensity" emission rate *for each state* based on what EPA thinks each state *could do* to reduce GHG emissions**
- **Carbon intensity of existing coal: 2,276 lbs CO2/ MWh**
- **Of existing NGCC: 827 lbs CO2/MWh**

(FYI, best NGCC plant in AR is at 839 lbs CO2/MWh)

- **Conventional oil/gas steam: 1,446 lbs CO2/MWh**
- **Hydro and nuclear do not count**
- **Renewables and DSM/EE do count**

Baseline Year: 2012

- **Coal units in AR ran at 72% capacity factor: FC, WB, ISES, Plum Point. (28 Million MWh for reference)**
- **NGCC units ran at 32% CF**
- **O/G Steam ran at less than 5% CF**
- **Renewables less than 3% of generation**
- ***"Generation" excludes nuclear. EPA doesn't give existing nuclear credit for zero emissions since existing nuclear is not in calculation baseline.***
- ***Existing hydro also out of calculation.***

First year: 2020

- **Coal units in AR drop from 72% to 26% CF**
- **NGCC units ramp up from 32% to 70% CF**
- ***A shift of 18,710,000 MWH.***
- ***$75 million in extra fuel costs at current rates***
- **O/G Steam run less than 3% CF**
- **Renewables up from 2% to 5% of generation**
- **Energy efficiency potential: 1.52%**

Last year: 2030

- Coal units in AR drop from 72% to 26% CF
- NGCC units ramp up from 32% to 70% CF
- O/G Steam run less than 3% CF
- Renewables up from 2% to 5% of generation
- Energy efficiency potential: 9.71%

EPA Target Results:

- **Targets for Arkansas:**

  Drop from a Carbon Intensity of

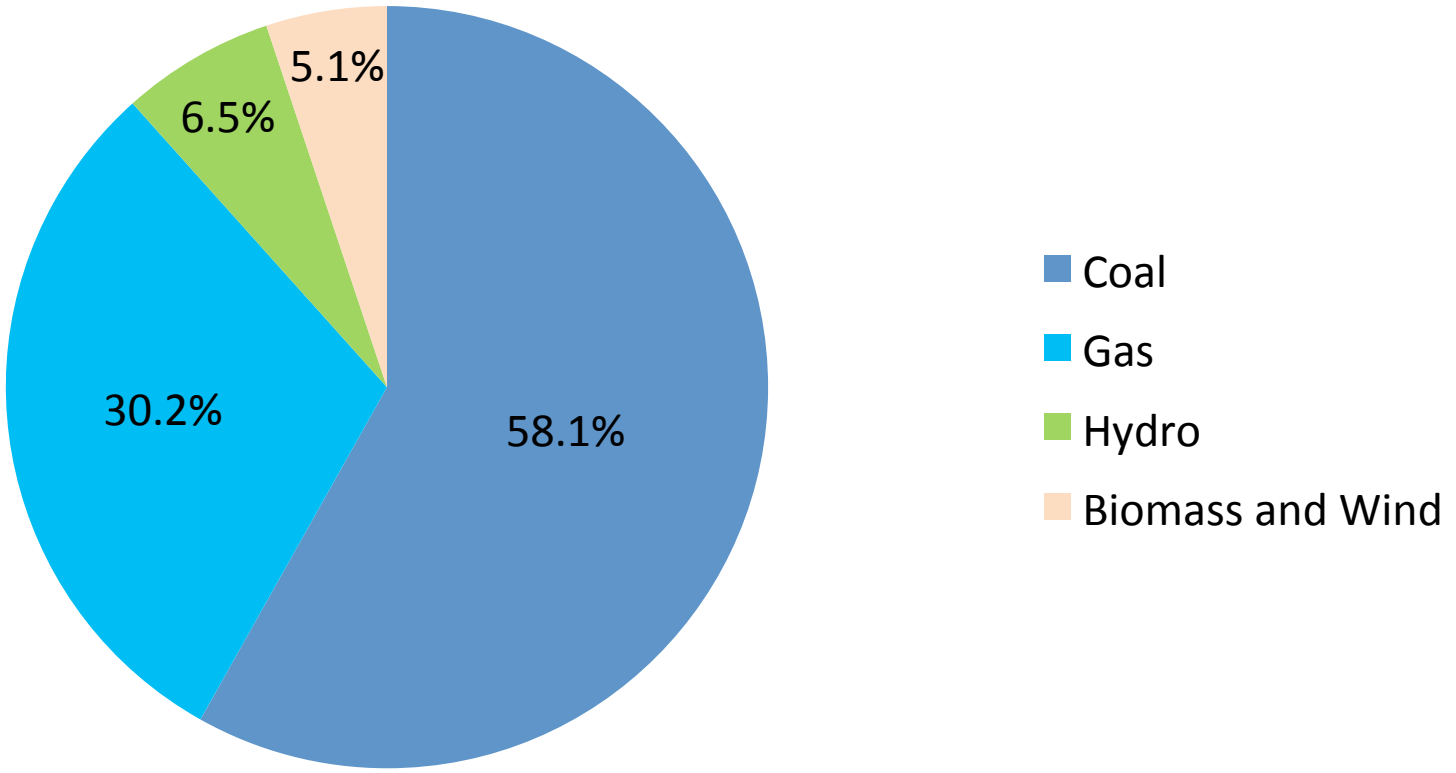
  1,668 lbs CO2/MWh in 2012

  to 968 (average) from 2020-2029

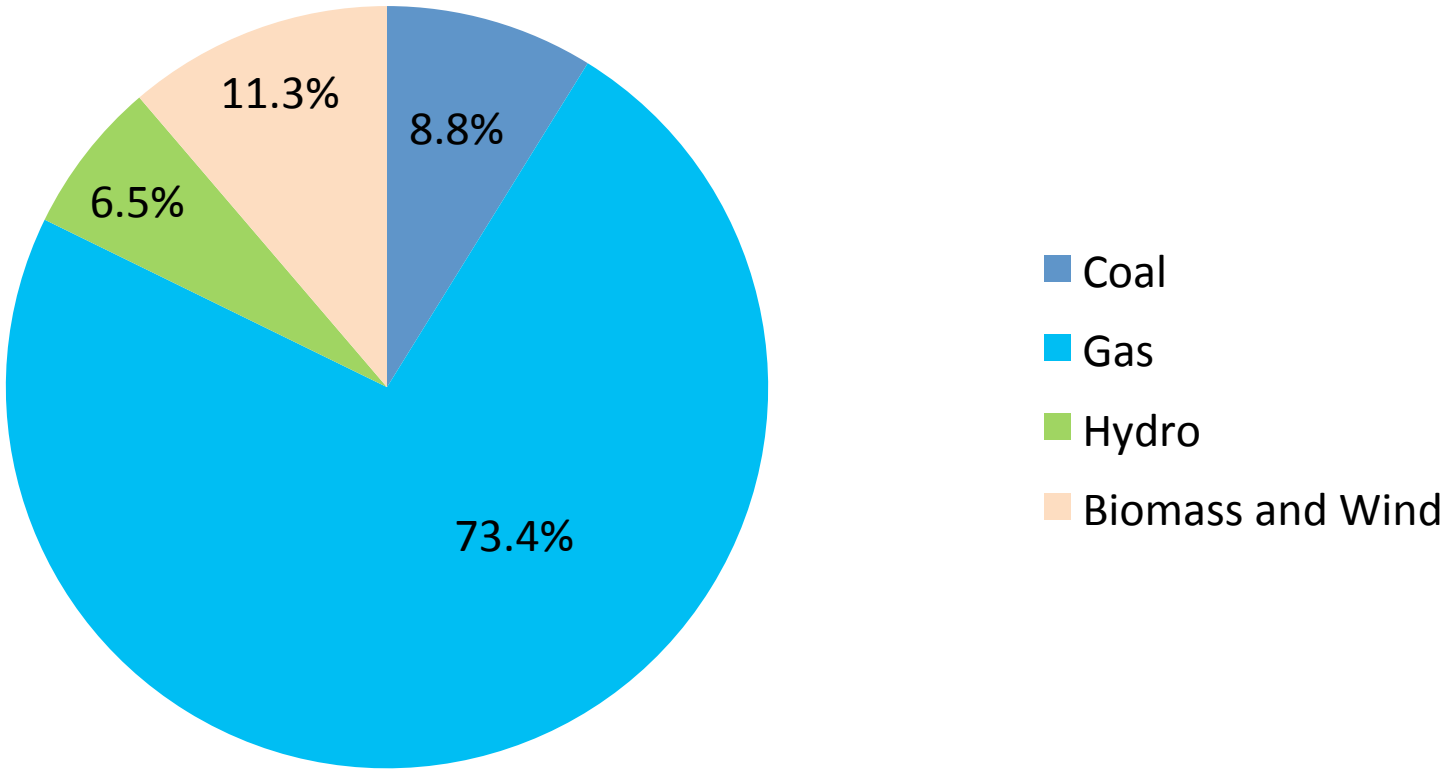
  to 910 by 2030.

  A 44 % reduction in Carbon Intensity
- **7th largest reduction of all the states**
- **Average reduction: 30%**
- **35% for southern states**

2020 AECC Generation Mix, Base Case



2020 AECC Generation Mix
"Primary Scenario"



Uncertainty

- How will new plants be treated for a partial year?
- Will EPA allow revisions to its target methodology ?
- How can units be dispatched correctly with this added constraint?
- How to cover costs?
- Where will new renewables be built?
- Which state gets credit for adding renewables, where built or where purchased?
- How will states in multiple RTO's account for differences?
- What penalties will EPA/states issue for non-compliance?

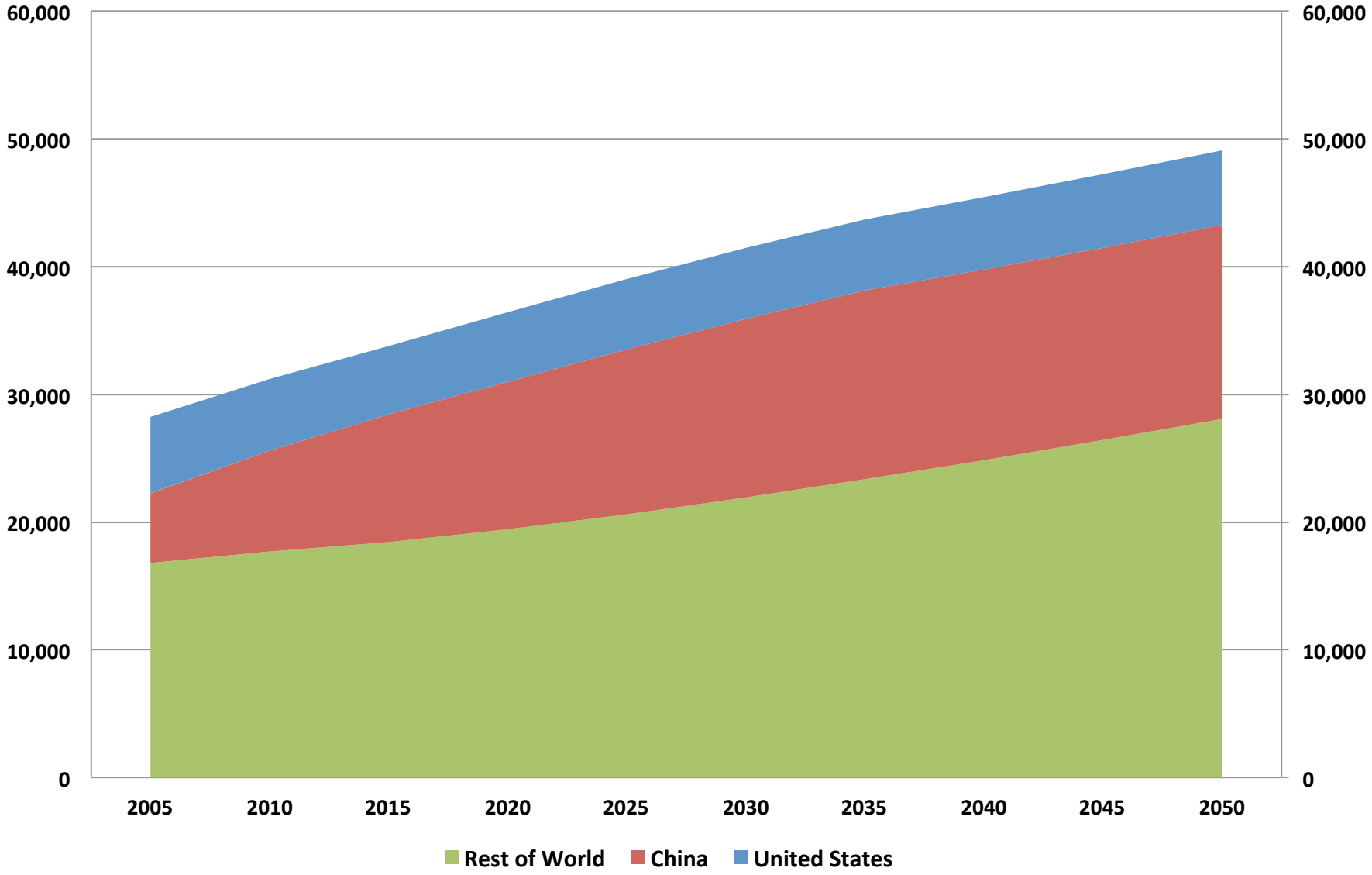
Legal Issues

- A serious legal argument is that under 111(d) BSER should only relate to effective efficiency improvements that can be made AT THE PLANT – or "inside the fence"
- Typically at most 1.0 - 2.5%. (EPA used 6%.)

  (EPA did not grant relief from NSR for these upgrades)
- Even 6% did not yield the GHG reductions EPA wanted
- So EPA came up with a different – and questionable – approach: "outside the fence" – get reductions apart from the actual source: everything from DSM, renewables, but mostly displacing coal with gas and fuel switching

Legal challenges will come:

- **Major issue: Does Section 111 (d) of the Clean Air Act allow BSER to be set "outside the fence" as EPA is doing?**
- **Latest court challenges to EPA have not been not in favor of utilities**
- **Courts have given EPA wide discretion to interpret the Act**
- **Most recent example: CSAPR rule upheld by the Supreme Court.**


World Carbon Dioxide Emissions
Million Metric Tons
60,000
50,000
40,000
30,000
20,000
10,000
0
2005
2010
2015
2020
2025
2030
2035
2040
2045
2050
Rest of World
China
United States

World Carbon Dioxide Emissions
Million Metric Tons per Year