

# Arkansas Power Plant Emissions and the Arkansas 111(d) Proposed Goals

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# Proposed (Option 1) AR emissions reduction target:

- ▶ 44% emissions rate reduction in 2030 (not an absolute CO2 mass reduction).
- ▶ 41% emissions rate reduction to 968 lbs/MWh, averaged over 2020–2029.
- ▶ Two takeaways
  - The interim average goal accommodates fluctuations and “glidepaths.”
  - Still, for Arkansas, most of the 2030 goal must be met earlier.

# The Goal-setting formula

- ▶ <http://www.regulations.gov/#%21documentDetail;D=EPA-HQ-OAR-2013-0602-0255>
- ▶ This is an Excel spreadsheet. Other Excel spreadsheets online provide the inputs.

# Baseline data vs. ongoing new data

- ▶ The proposed EPA baseline for goal-setting used actual 2012 generation (MWh) and CO2 emissions data from Arkansas power plants.
- ▶ But compliance with the goal will use ongoing, real generation and emissions data, with adjustments allowed by the rule. (more on that below).

# How did EPA get this Arkansas goal?

1: Increase coal plant efficiency by 6%.

( 5% emissions rate reduction)

2. Run CC gas plants at 70%; re-dispatch coal/oil.

(30% emissions rate reduction)\*

3. Add renewable energy/new nuke.

( 4% emissions rate reduction—RE 7% of gen for AR by 2030)

4. Add EE.

( 5% emissions rate reduction)

\*68% of the total Arkansas goal.

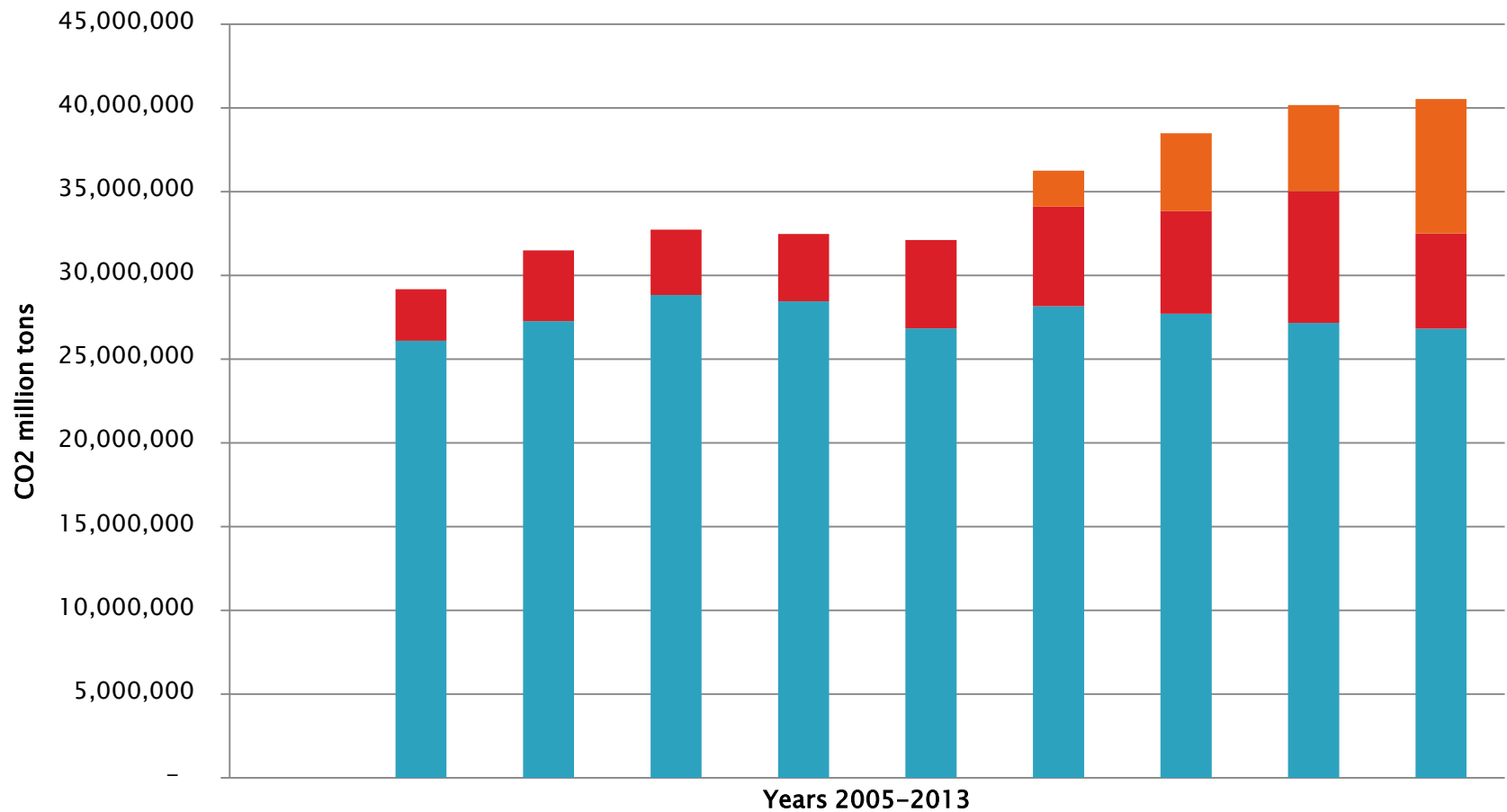
# Some observations about NGCC in the goal-setting formula.

- ▶ The EPA goal-setting formula recognizes existing NGCC nameplate capacity in each state.
- ▶ Formula implies NGCC rises from 16 million MWH (32% capacity) to 34 million MWH (70% capacity). (+18 mMWH)
- ▶ Coal generation drops from 28 million MWH to 10 million MWH. (-18 mMWH)

# More observations

- ▶ NGCC re-dispatch assumptions have a small impact in some states, but a big impact on the size of the Arkansas goal.
- ▶ The goal-setting formula does not dictate how the goal is met.

# 2005–2013 Arkansas power plant CO2 emissions (EPA Clean Air Markets database.)





Retail customer kWh sold in Arkansas '05-'13:

+ 1%

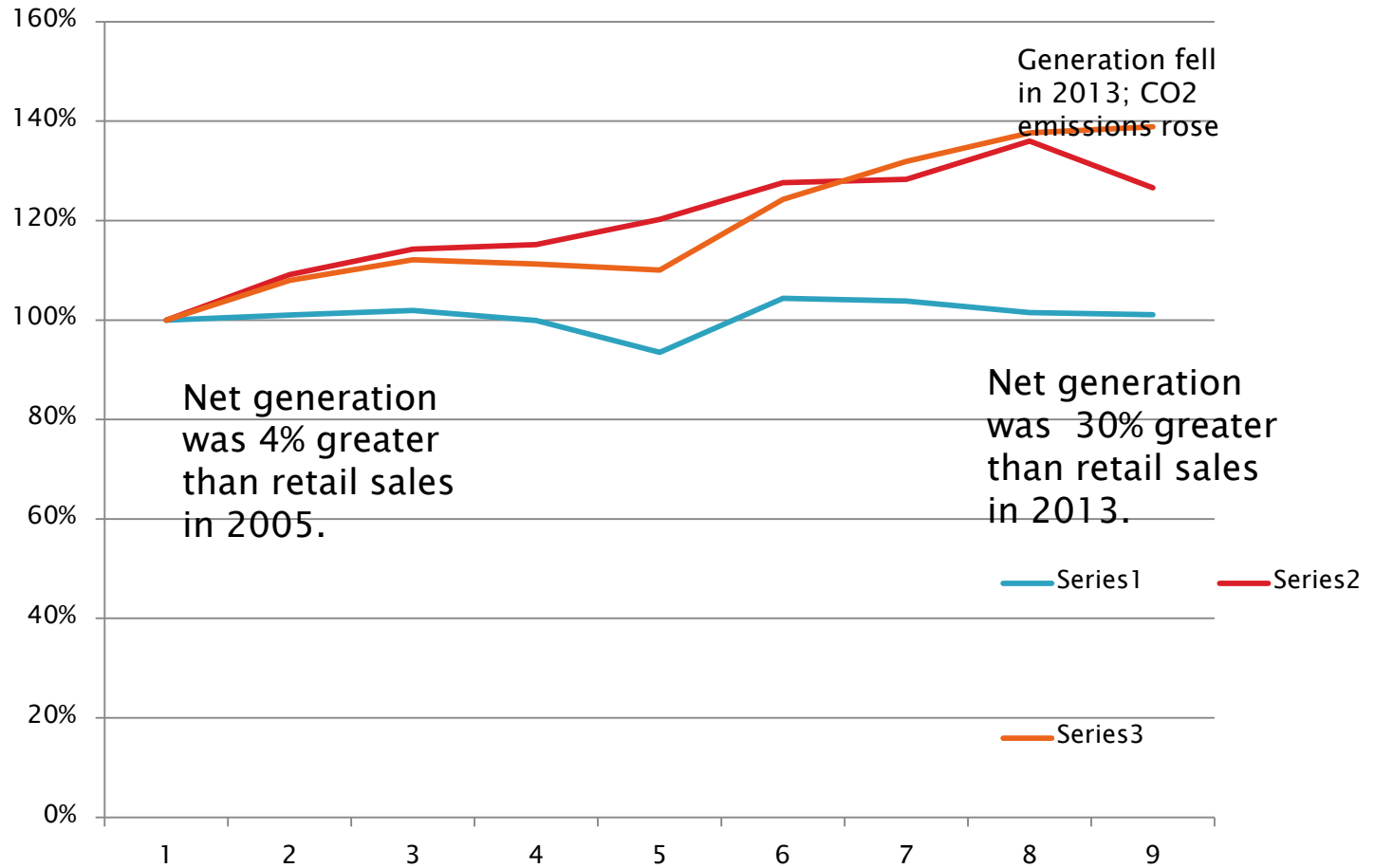
kWh generated in Arkansas '05-'13

+27%

CO2 emissions '05-'13

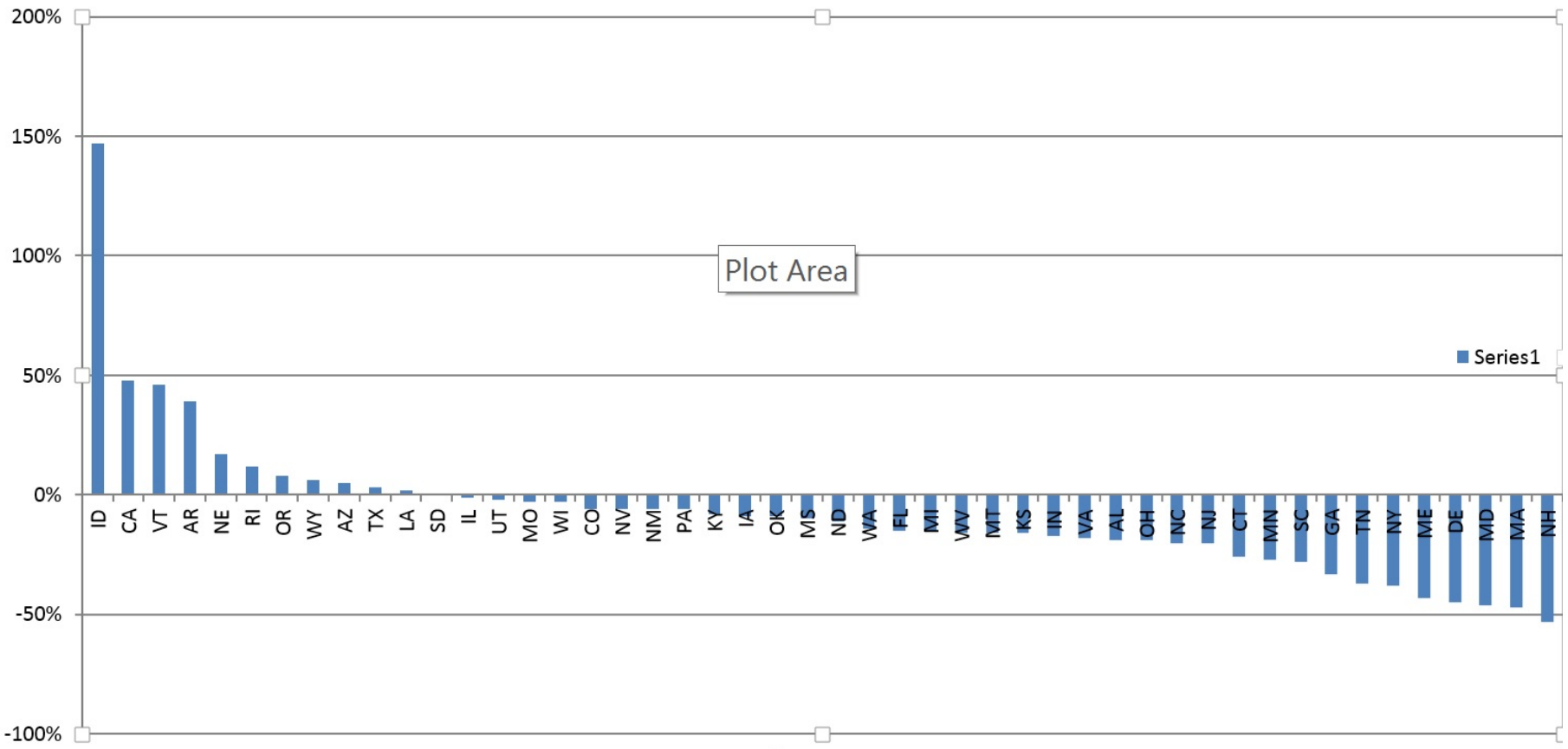
+39%

(each trend normalized to 1 in 2005)

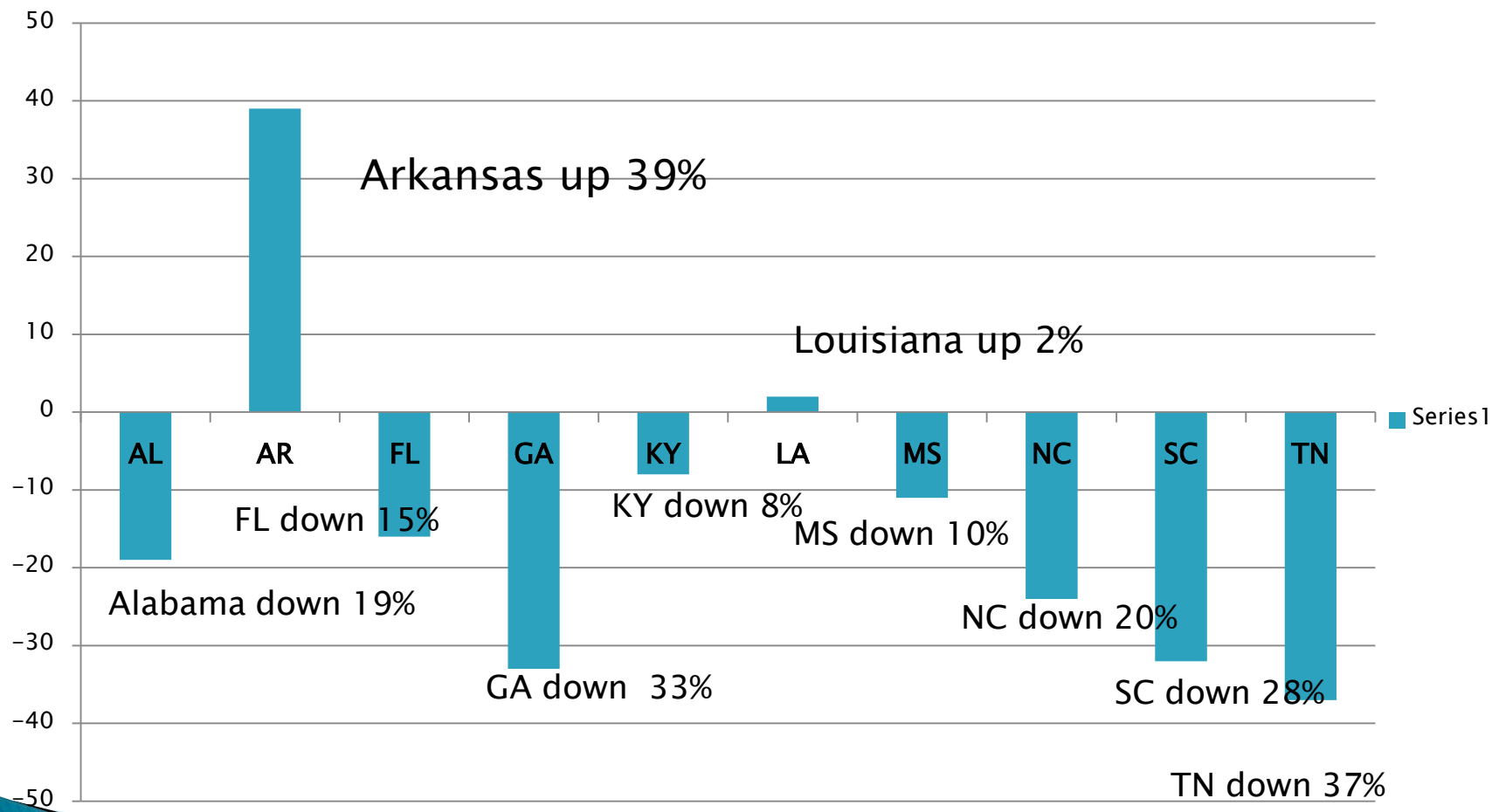


# 50 States: 2013 vs. 2005 CO2 emissions

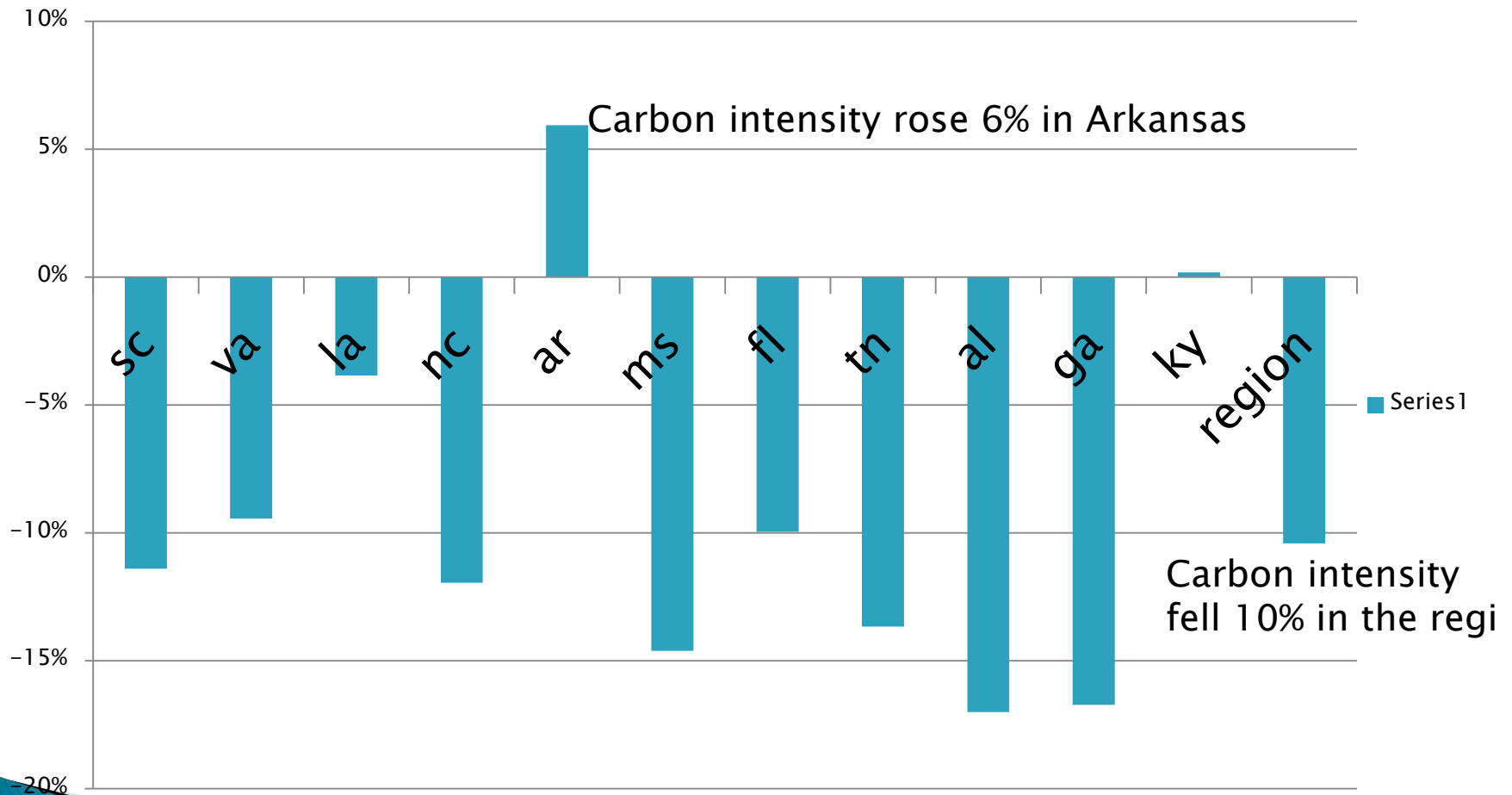
(EPA clean air markets database)



# Southern States 2013 vs. 2005 Power Plant CO2 emissions



# Not only electricity generation, but also carbon per kWh (“carbon intensity”) rose in Arkansas.



# 2012 Plant-level CO2 emissions

(EPA Clean Air Markets Database) (Remember: goal is rate not mass reduction)

## Coal

White Bluff: 11.2 MT

Independence: 11.8 MT

Flint Creek: 4.2 MT

Turk: 0.2 MT

Plum Point: 4.9 MT

32.3 MT

80%

2013 Total: 40.2 m tons

## NGCC

Union Power: 4.3 MT

Pine Bluff: 0.8 MT

Hot Spring: 0.2 MT

Magnet Cove: 1.1 MT

6.4 MT

16%

# 2013 Plant-level CO2 emissions

(EPA Clean Air Markets Database) (Remember: rate not mass reduction)

## Coal

White Bluff: 12.5 MT

Independence: 11.0 MT

Flint Creek: 3.3 MT

Turk: 3.7 MT

Plum Point: 4.3 MT

34.8 MT

86%

2013 Total: 40.5 m tons

## NGCC

Union Power: 2.8 MT

Pine Bluff: 0.9 MT

Hot Spring: 0.8 MT

Magnet Cove: 0.5 MT

5.0 MT

12%

# Final observations:

- ▶ Rate reduction, not absolute reduction: Heat rate improvement, RE, EE count.
- ▶ In any case (including alternate goals), the proposed Arkansas reduction is significant.
- ▶ Potential avenues for stakeholder exploration?
  - Rate vs. Mass based.
  - EPA alternate goals.
  - Multi-state compliance.