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


- This is an Excel spreadsheet. Other Excel spreadsheets online provide the inputs.
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:

kWh generated in Arkansas ‘05–’13

CO2 emissions ‘05–’13

(each trend normalized to 1 in 2005)

Generation fell in 2013; CO2 emissions rose.

Net generation was 4% greater than retail sales in 2005.

Net generation was 30% greater than retail sales in 2013.

Series 1

Series 2

Series 3
50 States: 2013 vs. 2005 CO2 emissions
(EPA clean air markets database)
Southern States 2013 vs. 2005
Power Plant CO2 emissions

Arkansas up 39%

Louisiana up 2%

Alabama down 19%

FL down 15%

KY down 8%

LA down 33%

MS down 10%

NC down 20%

SC down 28%

TN down 37%
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)

<table>
<thead>
<tr>
<th>Coal</th>
<th></th>
<th>NGCC</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>White Bluff:</td>
<td>11.2 MT</td>
<td>Union Power:</td>
<td>4.3 MT</td>
</tr>
<tr>
<td>Independence:</td>
<td>11.8 MT</td>
<td>Pine Bluff:</td>
<td>0.8 MT</td>
</tr>
<tr>
<td>Flint Creek:</td>
<td>4.2 MT</td>
<td>Hot Spring:</td>
<td>0.2 MT</td>
</tr>
<tr>
<td>Turk:</td>
<td>0.2 MT</td>
<td>Magnet Cove:</td>
<td>1.1 MT</td>
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<tr>
<td>Plum Point:</td>
<td>4.9 MT</td>
<td></td>
<td>6.4 MT</td>
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<tr>
<td></td>
<td>32.3 MT</td>
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<td>16%</td>
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<td></td>
<td>80%</td>
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</tbody>
</table>

2013 Total: 40.2 m tons
## 2013 Plant-level CO2 emissions

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

<table>
<thead>
<tr>
<th>Coal</th>
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</tr>
</thead>
<tbody>
<tr>
<td>White Bluff:</td>
<td>Union Power:</td>
</tr>
<tr>
<td>12.5 MT</td>
<td>2.8 MT</td>
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<tr>
<td>Independence:</td>
<td>Pine Bluff:</td>
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<tr>
<td>11.0 MT</td>
<td>0.9 MT</td>
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<tr>
<td>Flint Creek:</td>
<td>Hot Spring:</td>
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<tr>
<td>3.3 MT</td>
<td>0.8 MT</td>
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<tr>
<td>Turk:</td>
<td>Magnet Cove:</td>
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<td>3.7 MT</td>
<td>0.5 MT</td>
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<tr>
<td>Plum Point:</td>
<td>5.0 MT</td>
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<tr>
<td>4.3 MT</td>
<td>12%</td>
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<tr>
<td>34.8 MT</td>
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<tr>
<td>86%</td>
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</tbody>
</table>

2013 Total: 40.5 m tons
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.