THE PROPOSED CLEAN POWER PLAN RULE

WHAT DOES IT SAY AND WHAT DOES IT MEAN FOR ARKANSAS?

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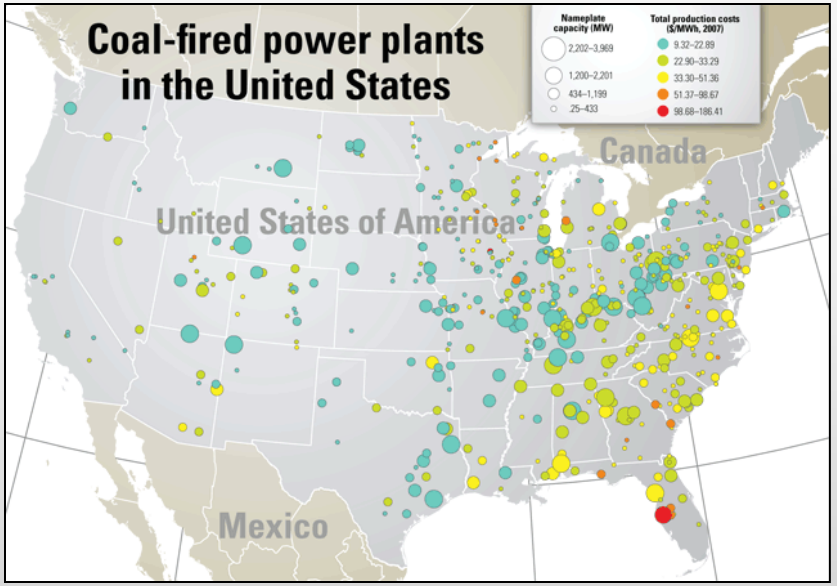
The Clean Power Plan Proposal

On June 2nd, EPA proposed the country's first limits on carbon pollution from our nation's fleet of more than 1,600 fossil fuel-fired electric power plants.



The Clean Power Plan Proposal

Specifically, EPA proposed emission guidelines for states to follow in developing plans to address greenhouse gas emissions from **existing** fossil fuel-fired electric generating units (not to be confused with EPA's proposed rule for future power plants, which was issued on September 30, 2013).

The Proposal Includes…

1. **State-specific rate-based goals** for carbon dioxide emissions from the power sector
2. **Guidelines** for states to follow in developing plans to achieve the goals.

Publication and Deadlines

- The proposed rule was published in the Federal Register on **June 18, 2014**[1].

- All comments on the proposal must be received by EPA by **October 16, 2014**.

1. http://www.gpo.gov/fdsys/pkg/FR-2014-06-18/pdf/2014-13726.pdf

National Impact

EPA estimates that the national impact of meeting the state targets will reduce the national power sector CO2 emissions

- **26% below 2005 emissions by 2020**
- **30% by 2030**.

In the proposal, EPA set targets for **each individual state** to reduce the "carbon intensity" of its power fleet.

State Goals

- These individual state goals are expressed as **emissions rates:** pounds of CO2 emitted per megawatt-hour of net generation.
- Carbon intensity is measured in pounds of CO2 emitted per megawatt-hour of electricity generated.

*NOTE: EPA proposes that a state could adopt the rate-based form of the goal OR an equivalent **mass-based** form of the goal. A multi-state approach incorporating either a rate-or mass-based goal would also be approvable.

Interim and Final Goals

EPA assigned an **interim emissions goal** and a **final emissions goal** to each state for their existing power plants.

Interim and Final Goals

- The targets were set in two phases: one beginning in **2020** and another in **2030**.
- States meet their **interim** goals through an adjusted average emissions rate.
- Existing in-state power plants' emissions averaged over a 10-year period from 2020 to 2029.

Each state must meet its **final** goal on a three-calendar year rolling average starting January 1, 2030.

BSER: EPA's Four "Building Blocks"

According to EPA's proposal, the interim and final state emission goals were developed based on its definition of the **"best system of emissions reduction"** (BSER) for CO2 emissions from existing power plants.

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BSER: EPA's Four "Building Blocks" *cont.*

EPA calculated the goals by taking into account four categories of potential emission reductions, or "building blocks", which **taken together** represent the BSER.

BSER: EPA's Four "Building Blocks" *cont.*

These carbon emission-reduction measures include:

1. Improving efficiency at individual coal-fired units;
2. Increasing use of existing natural gas units in place of higher-emitting coal-fired units;
3. Expanding low- and zero-emissions generation, such as renewable energy sources or nuclear energy
4. Implementing demand-side efficiency measures.

Arkansas Snapshot

For our state's power plants under consideration in the rule, we had a total of 37 million metric tons of CO_2e GHG emissions in 2012[1].

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[1] http://ghgdata.epa.gov/ghgp/main.do#/facility

Arkansas Snapshot

The change in carbon pollution in Arkansas from the power sector from 2005 to 2012 was a 35% increase[2].

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[2]U.S. Energy Information Administration. "U.S. Electric Power Industry Estimated Emissions by State: 1990-2012." State Historical Tables EIA-767, EIA-906, EIA-920, and EIA-923. http://www.eia.gov/electricity/data/state/ (accessed May 12, 2014).

Arkansas Snapshot

Our 2012 carbon emission rate, as calculated by EPA, was 1,634 lbs/MWH[3].

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[3]Goal Computation Technical Support Document, EPA, Office of Air and Radiation (June 2014).

Arkansas Snapshot *cont.*

Of our sources of electricity produced in AR in 2012, the breakdown was as follows:

Coal- 43.7%

Natural gas- 26.3%

Nuclear- 23.8%

Renewables- 5.9%[4]

[4]Aggregated from the following for 2012. U.S. Energy Information Administration. “Net Generation by State by Type of Producer by Energy Source: 1990-2012.” State Historical Tables EIA-906, EIA-920, and EIA-923. http://www.eia.gov/electricity/data/state/ (accessed May 9, 2014).

EPA's Proposal for Arkansas's Goals

- To develop each state's interim and final emissions goals, EPA applied each building block of the BSER to each state's emissions and generations for 2012.
- According to EPA's calculations, Arkansas's intensity-based emission standard for 2012 was **1,634** lbs/MWh.

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EPA's Proposal for Arkansas's Goals *cont.*

- After applying the four building blocks, Arkansas's interim goal (the average for 2020-2029) was set at **968** lbs/MWh.
- That calculates out to a **41%** reduction in the emission rate compared to 2012.

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EPA's Proposal for Arkansas's Goals *cont.*

- Application of the four building blocks yielded a 2030 state goal of **910** lbs/MWh.
- That calculates out to a **44%** reduction in the emission rate compared to 2012.

Only 5 other states have a 2030 goal percent reduction greater than AR.

The Building Blocks

According to EPA, use of the Building Blocks is designed to promote **flexibility** in reaching each state's target.

Does each state have to utilize each building block as specified in EPA's proposal?

No. A state can develop a plan that achieves more or fewer reductions from each of the four building blocks (or none of them at all, i.e., an alternative plan), as long as the state ultimately reaches its final CO2 emission rate reduction goal for its combined affected electric generating units.

Block 1- Making existing plants more efficient

- Calls for reducing the carbon intensity of generation at individual affected EGUs through heat rate improvements (i.e., improving the on-site efficiency of power plants).
- EPA estimates that existing fossil-fuel fired power plants can improve their heat rate by 6% on average based on adopting best practices (i.e., hardware and software tweaks) to reduce heat-rate variability and implementing equipment upgrades.
- ADEQ sent letters out to SWEPCO, Entergy and Plum Point requesting information re: heat rate improvements on July 9, 2014.

* As of 8-8-14, have received information from SWEPCO and Plum Point.

Block 2- Redispatch

- Calls for reducing emissions from the most carbon-intensive affected EGUs (i.e., coal-, oil-, and natural gas-fired steam generation units) by substituting generation from less carbon-intensive gas combined cycle (NGCC) generation units.
- Relies on the “already built” (i.e., unused capacity) gas power plants in a state and those in the pipeline.
- Dispatch to existing and under-construction NGCC units to up to 70% target utilization factor.
- Displaces the state’s current use of coal with an increase in natural gas generation.

*Potential issue: transmission constraints!

Block 3- Increased Renewables and Nuclear

Calls for reducing emissions from affected power plants by replacing generation from affected units with expanded low- or zero-carbon generation, including increased generation from new renewable and nuclear generation, and avoided retirement of existing nuclear generation.

For this step, EPA calculated the reduction that would occur if the state grew its renewable energy generation in an amount equal to the average required by the current renewable portfolio standards (RPS) in the same **region.**

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Block 3- Increased Renewables and Nuclear

*EPA's methodology for calculating reduced emissions achievable from Building Block 3 looks at three opportunities:

1. Completing all nuclear units currently under construction;
2. Avoiding retirement of about 6% of existing nuclear capacity; and
3. Increasing renewable electric generating capacity over time through the use of state-level renewable generation targets consistent with renewable generation portfolio standards that have been established by states in the same region.

Block 4- Increased End-Use Efficiency

- Calls for reducing emissions from affected EGUs in the amount that results from the use of demand-side energy efficiency that reduces the amount of generation required.

- EPA proposes that beginning in 2017, states ramp up their energy efficiency (EE) by 0.2% incremental savings per year until they hit 1.5% and then hold that level through 2030 and beyond.

*EE cost and potential will vary by state

The formula: breaking it down

EPA computed each state's goals using the following formula:

Numerator = Emissions

(Total adjusted CO2 emissions for affected units (after applying blocks 1 and 2))

Denominator = Generation (MWh)

Total net generation for affected units + annual net generation for all non-hydro renewable and nuclear (block 3) + estimated cumulative MWh saved through energy efficiency (block 4)

EPA's formula: Applying the math to Arkansas

So, how does this play out for Arkansas?

The breakdown for our 44% intensity-based emissions reduction is as follows:

1. Block 1- 11%
2. **Block 2- 68.5% (Redispatch)**
3. Block 3- 8.6%
4. Block 4- 11.9%

EPA's formula: Applying the math to Arkansas

Let's look at the 2012 emission rate and application of each building block.

Where does each block get us (starting from 1,634 lbs/MWh)?

1. Application of block 1: 1,554 lbs/MWh (5%)
2. Application of blocks 1 & 2: 1,058 lbs/MWh (35%)
3. Application of block 1, 2, & 3: 996 lbs/MWh (39%)
4. Application of blocks 1, 2, 3, & 4: 910 lbs/MWh[1] (44%)

1. Goal Computation Technical Support Document, EPA, Office of Air and Radiation (June 2014).

Available CO2 Reduction Options for Implementation

There is a wide range of CO2 reduction options that may count towards compliance. These include:

1. Heat rate improvements (process & equipment) at affected EGUs;
2. Fuel switching/co-firing (natural gas & biomass) at affected EGUs;
3. Coal and oil/gas steam plant retirements;
4. Shifting dispatch from higher emitting to lower/zero emitting;
5. End-use energy efficiency;
6. Combined heat and power; and
7. Reductions in transmission & distribution losses; and
8. Carbon capture and storage.[1]

9. 1 Clean Power Plan MISO June 19, 2014 webinar, Bipartisan Policy Center.

Alternate Goals (Option 2)

EPA has also developed for public comment an **alternate** set of goals reflecting:

1. Less stringent application of the building blocks; and
2. A shorter implementation period.

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Alternate Goals (Option 2) *cont.*

The alternate final goals **represent emission performance that would be achievable by 2025** (rather than 2030), after a 2020-2024 (rather than 2020-2029) phase-in period.

The interim goal would apply during the 2020-2024 period on an average basis as states progress toward their final goal.

Under the alternative proposal, Arkansas's goals are:

Interim: 1,083 lbs/MWh

Final: 1,058 lbs/MWh

Thinking “outside-the-fence”

What is the role for “outside-the-fence” emission reductions?

This question is **not directly answered** in EPA’s proposed rule.

However, in setting the goals for each state, EPA clearly anticipated that some reductions will in fact come from actions taken by entities/individuals **other than power companies or specific EGUs**.

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Thinking "outside-the-fence" *cont.*

For example, as discussed, one of the four building blocks is the application of demand-side energy efficiency measures (i.e., the installation of more efficient lighting products, better insulation, and more efficient electric appliances).

The rule also contemplates renewable energy policies and programs.

EPA's approval of our state plan

EPA is proposing to evaluate and approve state plans based on four general criteria:

- Enforceable measures that reduce EGU CO2 emissions;
- Projected achievement of emission performance equivalent to the goals established by the EPA, on a timeline equivalent to that in the emission guidelines;
- Quantifiable and verifiable emission reductions; and
- A process of biennial reporting on plan implementation, progress toward achieving the CO2 goals, and implementation of corrective actions, if necessary.

Deadlines

EPA will issue its final guidelines/goals in June 2015.

State plans are currently due on June 30, 2016.

However, EPA is proposing a two-phase submittal process for **individual** state plans.

1. Required components submitted on June 30, 2016.

2. Complete plan submitted by June 30, 2017.

If a state develops a plan that includes a **multi-state** approach, it would have until June 30, 2018 to submit a complete plan.

States participating in a multi-state plan may submit a single joint plan on behalf of all the participating states.

Remember: There were TWO proposed rules published on June 18, 2014

EPA also published its proposed "Carbon Pollution Standards for Modified and Reconstructed Stationary Sources: Electric Utility Generating Units" on June 18, 2014[1].

In this rule, EPA proposed standards of performance for emissions of greenhouse gases from affected **modified** and **reconstructe**d fossil fuel-fired electric utility generating units.

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1. http://www.gpo.gov/fdsys/pkg/FR-2014-06-18/pdf/2014-13725.pdf

Remember: There were TWO proposed rules published on June 18, 2014 *cont.*

The proposal includes standards to limit emissions of carbon dioxide from affected modified and reconstructed electric utility steam generating units and from natural gas-fired stationary combustion turbines.

Comments on the proposed standards must be received by EPA

on or before October 16, 2014.

Questions?

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