

The EPA's Clean Power Plan: State Impacts and Actions

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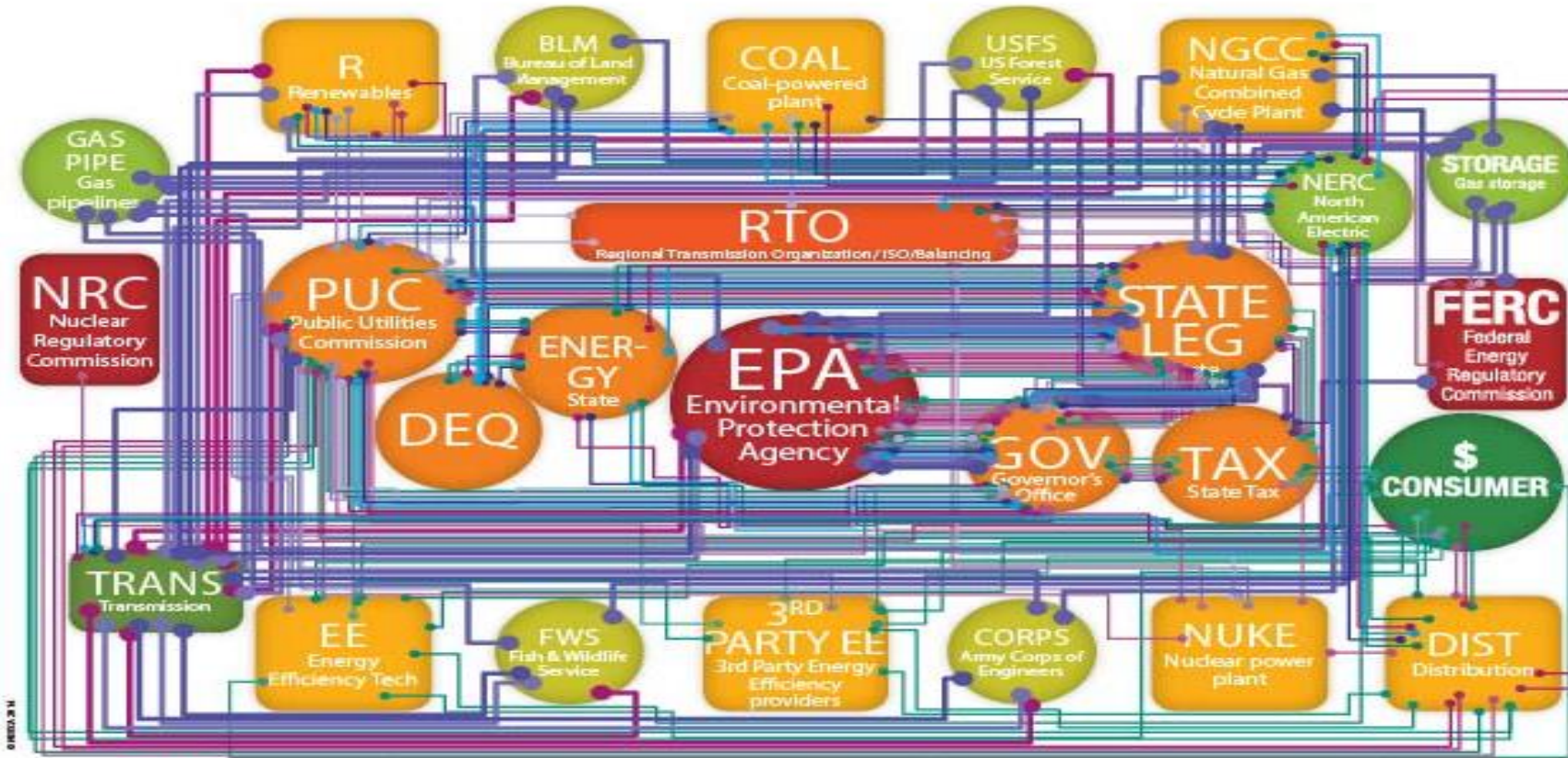
Up until now, power plants had a straightforward experience with the EPA

2



TYPICAL CLEAN
AIR RULE

With EPA's new Clean Power Plan, life's a lot more complicated



EPA PROPOSED CO₂ RULE

- ↔ IMPROVE EFFICIENCY OF EXISTING COAL-FIRED PLANTS
- ↔ INCREASE THE USE OF NATURAL GAS COMBINED CYCLE PLANTS

- ↔ INCREASE THE DEPLOYMENT OF RENEWABLE AND NUCLEAR ENERGY
- ↔ REDUCE DEMAND THROUGH END-USE ENERGY EFFICIENCY PROGRAMS

FEDERAL UTILITIES / 3RD PARTY REGIONAL POWER PRODUCERS STATE FEDERAL RESOURCE AGENCIES OTHER TRANSMISSION CONSUMER

The EPA's proposal will require every state to meet a goal to reduce its CO₂ intensity from the electricity sector in that state. Different states have different goals, depending on their specific energy mix. State-to-state power flows will involve a much larger array of regulators, legislators, and regulators within the various environmental regulatory bodies. This chart summarizes the complexity of the proposal.

Clean Power Plan

PROPOSED RULE - 130 pages

- 30% Nationwide CO₂ Reduction
- Interim standards begin 2020
- Budgets stated solely as state-wide emissions target goals

FINAL RULE - 1560 pages

- 32% Nationwide CO₂ Reduction
- Interim standards begin 2022
- Budgets now derived from subcategory performance limits for (1) fossil and (2) NGCC but still based on fleet-wide assumptions (e.g., outside the fence)

Coal Limits

- New – 1,400 lb/MWh-gross limit
 - Based on 20% CO₂ capture target (on Super Critical Unit)
 - Still relying upon subsidized demonstrations (violation of EPACT 2005)
- Modifications – for larger modification, based on each affected unit's own best potential performance
- Reconstructed
 - Sources with a heat input greater than 2,000 MMBtu/h would be required to meet an emission limit of 1,800 lb/MWh-gross and
 - Sources with a heat input of less than or equal to 2,000 MMBtu/h would be required to meet an emission limit of 2,000 lb/MWh-gross

Projected Impacts on the Coal Fleet

- In assessing the impacts of the final CPP, EPA assumes that a much smaller coal fleet will remain in the near future (“base case”) than EPA assumed in last year’s analysis of the proposed CPP. EPA is now assuming that there are will be far fewer coal units by 2020, even without the CPP.
- By assuming a “base case” with more coal retirements, EPA is able to claim that the final rule does less harm to coal because there are fewer coal units to be harmed.
- Compared to the proposal, the final rule assumes that 1/3 of the coal fleet (approximately 100 GW) will have retired by 2020 even without the CPP. This is considerably more than EPA projected for the proposed CPP (66 GW), more than EIA projects (55 GW), and more than ACCCE’s announced retirements (68 GW).
- The projected impacts of the final CPP — i.e., the harm to coal — would have been greater if EPA had used the same “base case” as the proposed CPP:
 - Electricity generation from coal declines by 22% under the final rule in 2030. This would have been a 31% reduction if EPA had used the base case from the proposed CPP.
 - Coal consumption declines by 21% (181 million tons) under the final rule in 2030. This would have been a 29% (282 million tons) reduction if EPA had used the base case from the proposed CPP.

Proposed vs. Final Rule Reductions

	PROPOSED REDUCTION	FINAL REDUCTION
Alabama	27%	33%
Colorado	35%	40%
Illinois	33%	44%
Indiana	20%	39%
Iowa	16%	42%
Kansas	23%	44%
Kentucky	18%	41%
Michigan	31%	39%
Missouri	21%	37%
Montana	21%	47%
Nebraska	26%	40%
New Mexico	34%	36%
North Dakota	11%	45%
Ohio	28%	37%
Pennsylvania	31%	35%
Rhode Island	14%	16%
South Dakota	35%	48%
Tennessee	39%	40%
Utah	27%	37%
West Virginia	20%	37%
Wisconsin	34%	41%
Wyoming	19%	44%
AVERAGE	-26%	-39%

. Revised 2012 emission rates are from EPA's Clean Power Plan State-Specific Fact Sheets. Final emission rate goals are from Table 12, pages 841, of EPA's final rule.

Biggest Loser States

- **North Dakota** was 11% but now is 45% (four times more stringent)
- **Iowa** was 16% but now is 42% (two-and-a-half times more stringent)
- **Kentucky** was 18% but now is 41% (more than twice as stringent)
- **Wyoming** was 19% but now is 44% (more than twice as stringent)
- **Kansas** was 23% but now is 44% (almost twice as stringent)
- **Montana** was 21% but now is 47% (more than twice as stringent)
- **Indiana** was 20% but now is 39% (twice as stringent)
- **West Virginia** was 20% but now is 37% (almost twice as stringent)
- **Missouri** was 21% but now is 37% (76% more stringent)

The Biggest Losers Under EPA's Clean Power Plan

- The final Clean Power Plan (CPP) includes two basic compliance options: one is RATE-BASED and the other is CAP-AND-TRADE — which EPA calls “mass-based” to avoid using the term cap and trade. Although EPA gives states the option of choosing between the two, it is clear that EPA prefers that states, individually or in groups, adopt cap-and-trade programs.
- Under either (or both) a rate-based or a cap-and-trade program, 22 states are the biggest losers because the final CPP is more stringent than the proposed CPP (Figure 1). All these states — except Rhode Island which has no coal-fired electricity generation — rely on coal to help maintain affordable electricity prices. The collective average retail electricity price for the 21 coal-reliant “biggest loser” states was 12% below the national average in 2014 (EIA). Rhode Island’s electricity price was 49% above the national average (EIA).
- However, the remaining states are not winners. Under a rate-based program, 46 states must reduce their CO₂ emissions rate by 10% or more below their 2012 emissions rate (Figure 2). Under a cap-and-trade program, 33 states must reduce their total CO₂ emissions by 10% or more below what they emitted in 2012 (Figure 3).

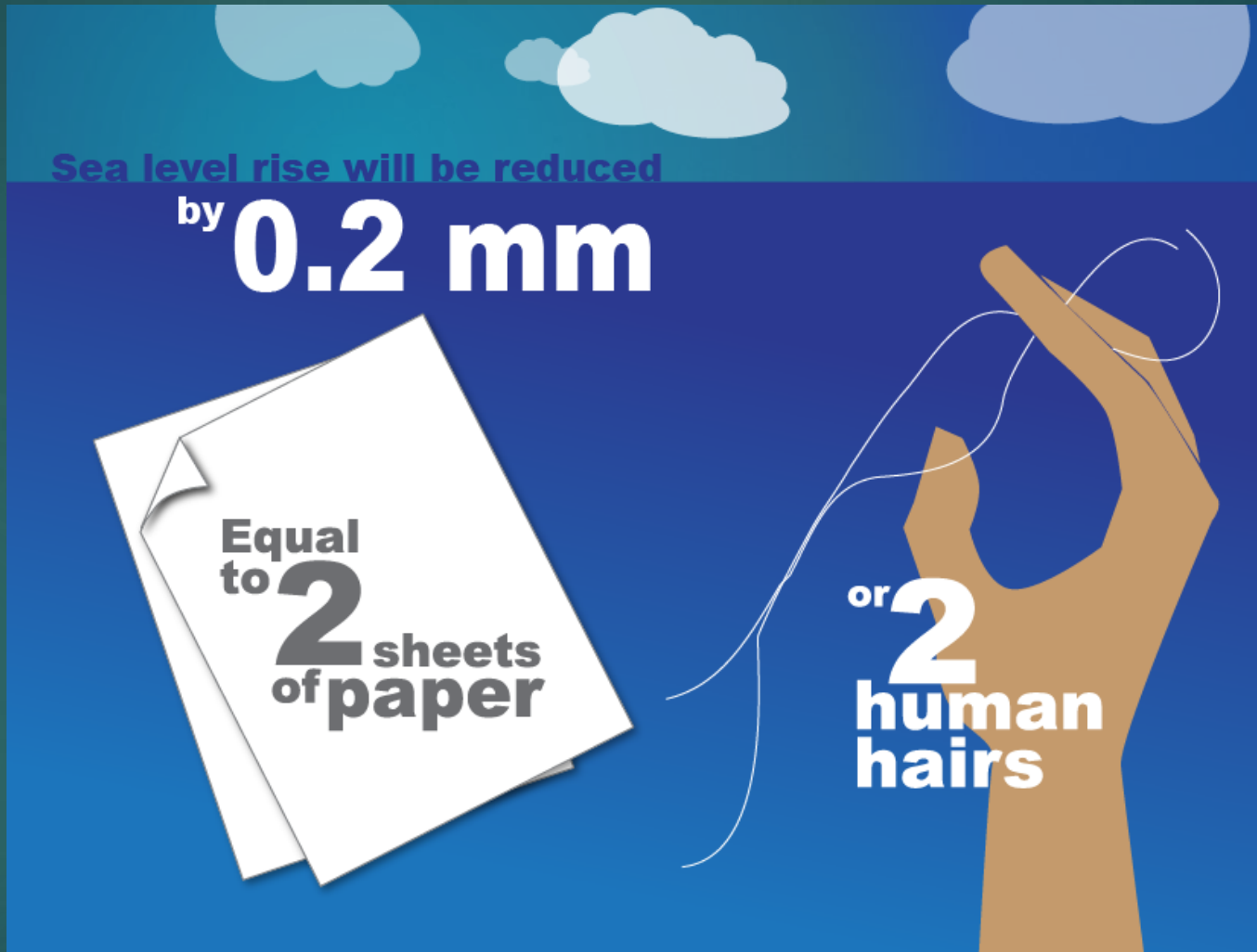
The Clean Power Plan Presents Many Problems

10

- EPA lacks legal authority
- EPA is usurping state authority
- Electricity prices will be higher
- Natural gas prices will be higher
- Electric reliability is threatened
- There are no climate change benefits

EPA's Proposal Will Have No Real Effect on Climate Change

11



Emission reductions from EPA's proposal and AEO 2014 are accumulated and scaled to projected emissions reductions and resulting climate effects from EPA's *Regulatory Impact Analysis: Final Rulemaking for 2017-2025 Light-Duty Vehicle Greenhouse Gas Emission Standards and Corporate Average Fuel Economy Standards*, August 2012, page 4-134 and 6-112.

A land area the size of 16 million football fields would be needed if wind turbines replace coal plants that are retiring due to the CPP

12

- EPA projects that 38,000 MW of coal capacity will retire by 2030 because of the Clean Power Plan (source: EPA's RIA). EPA also projects that 41,000 MW of non-hydro renewables, such as wind, will be added by 2030 because of the Clean Power Plan (source: EPA's RIA).
- Because of the intermittent nature of wind, less than 20% of its capacity is counted for reliability planning, while over 90% of the capacity of coal generation is counted (source: NERC). Thus, every MW of retired coal capacity would require at least 4.5 MW of wind to replace it, meaning that 38,000 MW of retired coal would require 171,000 MW of replacement wind because of reliability considerations.
- The Grande Prairie wind farm being constructed in Nebraska — and recently purchased by Berkshire Hathaway — has a capacity of 400 MW and spans an area of “over 50,000 acres,” or 125 acres per MW (source: geronimoenergy.com).
- 171,000 MW of wind would require more than 21 million acres, or almost 34,000 square miles. This amount of land would be equivalent to 494 Districts of Columbia, or 16 million football fields, or it would cover almost the entire State of Indiana (35,870 square miles).

A land the size of 800,000 football fields would be needed if utility-scale solar were to replace all the coal plants that are retiring because of the CPP

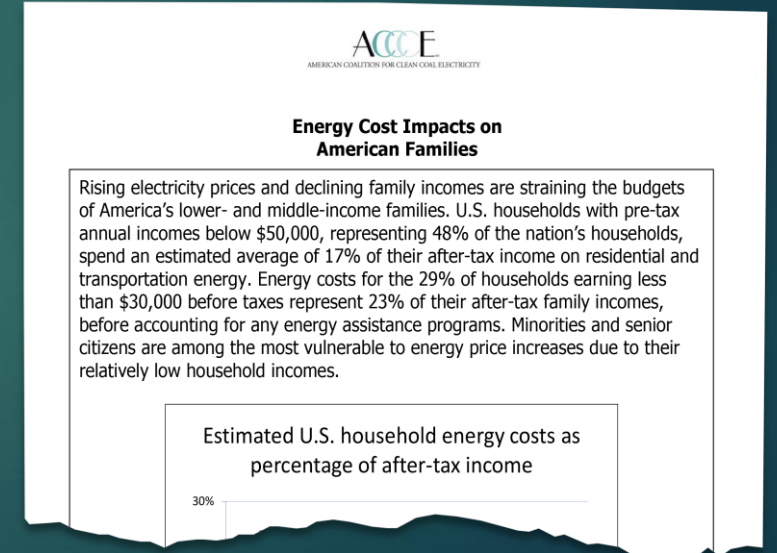
13

- EPA projects that 38,000 MW of coal-fired electric generating capacity will retire because of the Clean Power Plan (source: EPA). EPA also projects that 41,000 MW of non-hydro renewables, such as solar, will be added because of the Clean Power Plan (source: EPA). Currently, the U.S. has a total of 94 GW of non-hydro electric generating capacity (source: EIA).
- Because the sun doesn't always shine, approximately 25% of solar electric generating capacity is counted for reliability planning, while over 90% of the capacity of coal-fired generation is counted (source: NERC). Thus, each MW of retired coal capacity would require at least 3.5 MW of replacement solar. Consequently, 38,000 MW of retired coal capacity would require 133,000 MW of replacement solar because of reliability considerations.
- 133,000 MW of utility-scale solar would cover 1,064,000 acres — or 800,000 football fields (NREL estimates 8 acres/MW for utility-scale photovoltaic solar).

Family Energy Costs

14

- Family energy costs are rising, and family incomes are declining
- On average, half of the families in the U.S. (59 million households) take home less than \$1,900 per month
- These families spend 17% of their take-home pay on energy
- Impacts of energy costs on low-income families:
 - 24% went without food for at least one day
 - 37% went without medical or dental care
 - 34% did not fill a prescription or took less than the full dose



How States Can Respond

15

- Submit a compliant State Implementation Plan
- Submit a non-compliant plan
- Seek legal action
- Just SAY NO
- Regional Approach
- Hybrid approach

Timeline

17

- October 2015 - Federal Register (FR) Publication
- FR + 1-30 days - Motions to Stay filed
- FR + 60 days - Petitions for review of rule due
- FR + 90 days - Comments due on Proposed Federal Plan
- Winter 2015/16 - Potential ruling on Motions to Stay
- Summer 2016 - Finalization of model trading rules
- September 6, 2016 - Initial State Plans or Extension requests due
- Summer/Fall 2016 - Earliest DC Circuit Crt. Of App. decision
- September 6, 2017 - Progress update for states with extensions
- Summer/Fall 2017 - Earliest SCOTUS ruling on appeal
- September 6, 2018 - Final State Plans Due for states with extensions
- 2022-2029 - Interim compliance (must average interim budgeted rate)
- 2030 - Final budgeted rates must be met