

An Introduction to EPA's Clean Power Plan

Viewpoint
August 2014



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The U.S. Environmental Protection Agency is proposing a plan under the Clean Air Act to cut power plant carbon emissions

Introduction

- On June 2, 2014, the U.S. Environmental Protection Agency proposed a plan to cut carbon emissions from power plants 26% below 2005 emissions by 2020 and 30% by 2030
- This plan seeks almost 30% more emission cuts than the Clean Car Standards set in 2010 and 2012, which are forecasted to reduce carbon emissions by 4,140 million tons from 2020 to 2030.

Regulatory Approach

- EPA has recognized that the energy mix varies by state considerably and ...
- ... Various efforts to address emissions are underway in the states
- A combination of these diverse efforts and best-in-class systems were used to develop four building blocks to reduce emissions
- A uniform application of these building blocks to the various states and the resulting reduction from their 2012 emissions level was used to set state-specific goals
- States can flexibly develop their own plans and policies to achieve these goals

Timeline

- EPA is requesting comments on the proposal through September 30, 2014
- Final standards are due June 2, 2015
- States need to submit initial or final plans to EPA by June 30, 2016 with another year available for the remaining information.
- Plans for multi-state approaches must achieve at least individual state goals and can be submitted as late as June 30, 2018
- States may adopt rate- or mass-based interim (meet on average over 2020-2029) and final (meet at the end in 2030) goals

The proposed plan takes a state-based approach to drive emission reductions through four key levers

$$\text{State Baseline Emission Rate} = \frac{\text{Emissions (lbs. CO}_2\text{)}}{\text{Generation (MWh)}}$$

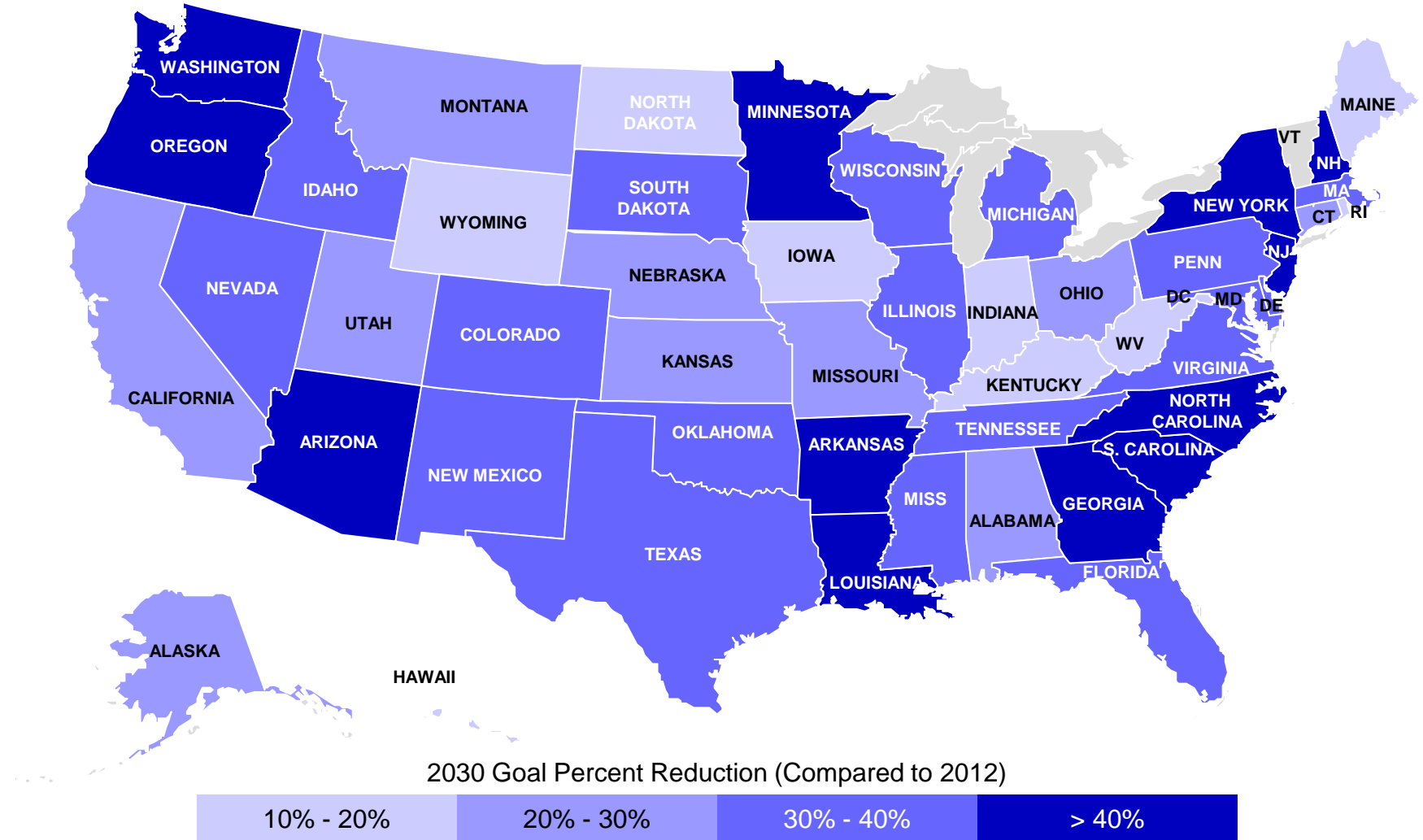
Baseline rate includes emissions from existing and upcoming fossil-fueled generators and historic generation from other sources

- 1 Improved coal plant efficiency
- 2 Increased use of natural gas
- 3 More renewables and nuclear
- 4 Energy efficiency initiatives

$$\text{State Goal in 2030} = \frac{\text{Re-dispatched fossil CO}_2\text{ emissions}}{\text{Baseline fossil generation + clean energy goal + EE goal}}$$

Given that each state has a unique energy mix, compliance targets vary widely across the U.S.

Emission Reductions required to meet 2030 Goal
(Compared to 2012 emission rates in lbs/MWh)



Each of the options EPA has proposed has its corresponding emission reduction potential and compliance costs

Option	Impact on Emission Rate	Discussion	Cost, \$/ton
1 Improved coal plant efficiency	$\frac{\text{Coal} - 6\% + \text{other baseline emissions}}{\text{Baseline generation}}$	<ul style="list-style-type: none"> Reduction in baseline coal emissions by improving average heat rate by 6% Average fleet-wide opportunity based on hardware and software optimization 	\$6 to \$12
2 Increased use of natural gas	$\frac{\text{Re-dispatched fossil CO}_2 \text{ emissions}}{\text{Baseline generation}}$	<ul style="list-style-type: none"> Emission reduction from replacement of coal-fired capacity with natural gas... ... Up to 70% capacity factor 	\$30
3 More renewables and nuclear	$\frac{\text{Re-dispatched fossil CO}_2 \text{ emissions}}{\text{Baseline fossil generation} + \text{clean energy goal}}$	<ul style="list-style-type: none"> Emission reduction from current and expanded use of renewables and Nuclear including under construction capacity additions 	\$10 to \$40
4 Energy efficiency initiatives	$\frac{\text{Re-dispatched fossil CO}_2 \text{ emissions}}{\text{Baseline fossil generation} + \text{clean energy goal} + \text{EE goal}}$	<ul style="list-style-type: none"> Emission reduction from capacity that was avoided due to use of energy efficiency initiatives Assumes an annual 1.5% increase in demand-side energy efficiency 	\$16 to \$24

While the EPA sees significant benefits and lower consumer electricity bills, other analysts estimate higher costs

EPA Estimates

▪ Environmental and health benefits

- Cut carbon emissions from the power sector by 30% from 2005 levels
- Cut pollution that leads to soot and smog more than 25% by 2030
- Climate and health benefits estimated at \$55 to \$93 billion in 2030...
- ... Including avoiding 2,700 to 6,600 premature deaths and 140,000 to 150,000 asthma attacks in children

▪ Economic costs

- The plan is estimated to cost \$7.3 to \$8.8 billion annually in 2030
- EPA also projects increases in energy efficiency and reduced growth in demand for electricity due to the plan ...
- ... Potentially translating to lower electricity bills with the reduction estimated at approximately 8%

U.S. Chamber of Commerce Estimates

- Total cumulative compliance costs will be nearly \$480 billion in constant 2012 dollars by 2030 and...
- ... U.S. consumers will likely pay nearly \$290 billion more for electricity between 2014 and 2030
- Lower average annual U.S. GDP by \$51 billion
- Lead to an average of 224,000 job losses through 2030, relative to baseline forecasts

In general, the plan has received credit for its flexible, state-based approach although several issues need further analysis

- ▶ **Wide support for the flexible approach to achieve compliance and ...**
 - The use of four different options to achieve compliance is well received
 - Sufficient lead time for utilities to integrate compliance with capital plans

- ▶ **... Strong reliance on delegating implementation to the states**
 - Recognition of the unique energy mix in each of the states ...
 - ... Along with the effort to leverage and benefit from their prior experiences including efforts around carbon emission trading, e.g., in California and the Regional Greenhouse Gas Initiative...
 - ... Although there will be some impacts from coordinating with both states and the EPA

- ▶ **Mixed reception for the role of energy efficiency**
 - Conceptually, energy efficiency could help consumers reduce energy bills but ...
 - ... There may be gaps in actually benefiting from energy efficiency initiatives

- ▶ **Several questions need further examination**
 - The impact on the costs and economics of power generation from different fuels and...
 - ...Compliance costs by state and company are two examples of several unanswered questions



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