

Q&A: EPA REGULATION OF GREENHOUSE GAS EMISSIONS FROM EXISTING POWER PLANTS



On August 3, 2015, the U.S. Environmental Protection Agency (EPA) adopted Carbon Pollution Standards for Existing Power Plants, known as the Clean Power Plan. Adopted pursuant to EPA's authority under the Clean Air Act, the Clean Power Plan establishes unique emission rate goals and mass equivalents for each state. It is projected to reduce carbon emissions from the power sector 32 percent from 2005 levels by 2030. Individual state targets are based on national uniform "emission performance rate" standards (pounds of CO₂ per MWh) and each state's unique generation mix. On February 9, 2016, the U.S. Supreme Court issued a stay of the Clean Power Plan, freezing carbon pollution standards for existing power plants while the rule is under review at the U.S. Court of Appeals for the District of Columbia Circuit.

To read this fact sheet online, visit <http://bit.ly/c2es-cpp-qa>

WHY DID EPA DEVELOP RULES TO REGULATE CARBON DIOXIDE?

Under the Supreme Court decision in *Massachusetts v. EPA*, greenhouse gases meet the definition of air pollutants under the Clean Air Act, meaning they must be regulated if they could be reasonably anticipated to endanger public health or welfare. EPA made this determination in 2009. In June 2013, President Obama directed EPA to work closely with states, power plant operators, and other stakeholders in developing carbon standards for existing power plants, and to finalize the standards by June 2015. EPA released its proposed rule in June 2014 and the final rule in August 2015.

WHY DO WE NEED TO REGULATE POWER SECTOR CARBON EMISSIONS?

The power sector is the largest source of U.S. carbon emissions, which are contributing to global climate change.

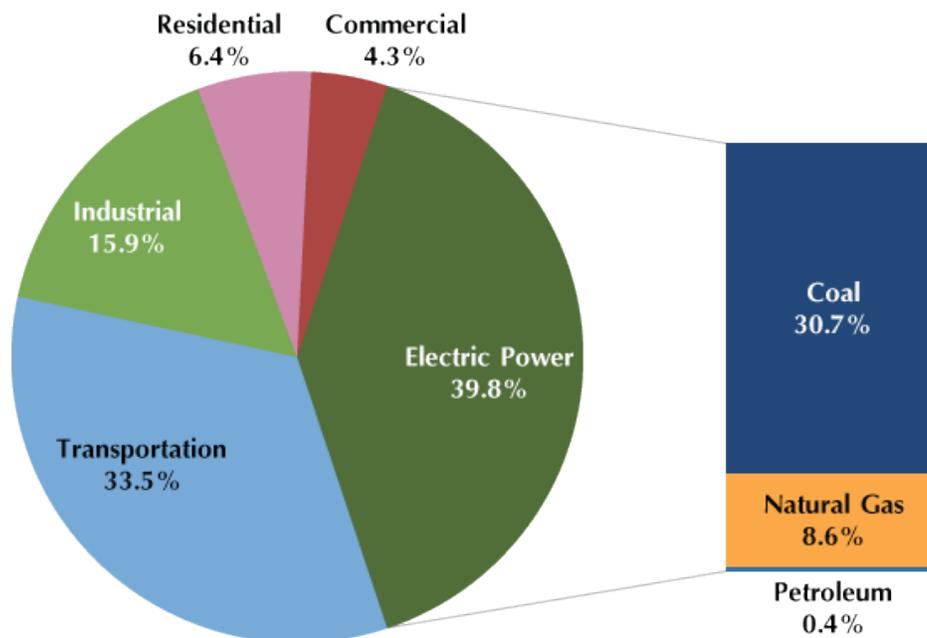
Many businesses, cities and states are cutting emissions, increasing renewable energy, and improving energy efficiency. In addition, newly abundant natural gas has begun to displace coal (which emits twice as much carbon) in the U.S. electrical generation mix. But in the absence of major new policies, U.S. emissions are projected to rise as the economy grows, and as

natural gas prices rise. Stronger policies are needed to increase energy efficiency, thereby reducing electricity consumption, and to expand the use of low- and no-carbon energy sources. Under a business-as-usual forecast, fossil fuels are projected to provide 66 percent of the U.S. fuel mix in 2030 compared with 60 percent under the Clean Power Plan, with most of the reduction coming from higher-emitting coal plants. Therefore, under a business-as-usual scenario, carbon dioxide emissions from the power sector are expected to increase around 6.5 percent (from 2014 levels) to 2,177 million metric tons in 2030, while under the Clean Power Plan carbon dioxide emissions would fall more than 19 percent (from 2014 levels) to 1,644 million metric tons in 2030.

WHAT IS IN EPA'S CLEAN POWER PLAN?

Typically, under the Clean Air Act, EPA sets standards and states implement them. The Clean Power Plan:

- Sets unique emission rates goals and mass equivalents for each state, reflecting the variation in their electricity generation mixes, to be met starting in 2022;
- Provides states significant flexibility in choosing how to meet their targets;

Figure 1: 2012 U.S. CO2 Emissions

Source: Energy Information Administration

- Provides incentives for early deployment of renewables and efficiency measures benefiting low-income communities;
- Provides tools to assist states choosing to implement market-based approaches; and
- Contains a Federal Implementation Plan that EPA would use in states that do not accept adequate implementation plans.

EPA set interim and 2030 targets for each state based on uniform emission performance rates (application of BSER) and its unique generation mix.

HOW WAS EACH STATE'S TARGET CALCULATED?

Uniform, national emission performance rates for affected power plants are based on the “best system of emission reduction” (BSER), using three “[building blocks](#)” or potential pathways applied regionally to reduce CO2 emissions:

1. Make affected fossil fuel power plants more efficient;
2. Increase generation from lower-emitting natural gas combined cycle plants; and

3. Increase generation from new zero-emitting renewable power sources.

See a [map of state targets](#) for a more detailed explanation.

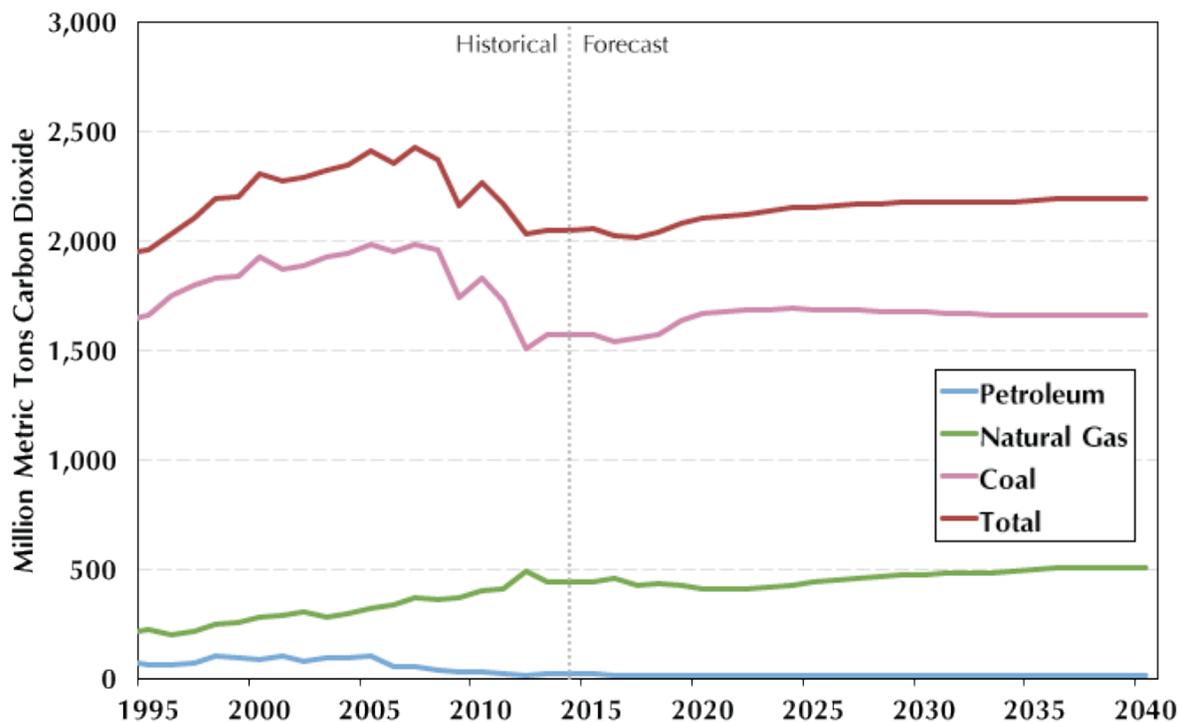
WHAT ARE THE BIG DIFFERENCES BETWEEN THE PROPOSED AND FINAL PLANS?

States will have more time to submit their implementation plans (they can get extensions to 2018) and two more years (until 2022) to begin phasing in pollution cuts. C2ES and others encouraged allowing states more time so they could take a longer view on planning and investment.

The final plan also proposes a voluntary [Clean Energy Incentive Program](#) (CEIP) to encourage early installation of renewable energy projects and energy efficiency programs for low-income communities before the 2022 compliance start date. EPA has invited comments on the CEIP and will address design and implementation details in a future action.

Market-based mechanisms are more explicitly encouraged in the final rule. The proposed federal implementation plan includes an option for states to join an interstate cap-and-trade program. It also outlines how states could participate in emis-

Figure 2: Projected Electric Power Sector Carbon Dioxide Emissions under Business-as-Usual Scenario



Source: C2ES analysis based on U.S. Energy Information Administration, "Monthly Energy Review" (Washington, DC: U.S. Energy Information Administration, 2014), <http://www.eia.gov/totalenergy/data/monthly/#environment>, and U.S. Energy Information Administration, "Annual Energy Outlook 2014" (Washington, DC: U.S. Energy Information Administration, 2014), <http://www.eia.gov/forecasts/aeo>.

sions credit trading without the creation of interstate compacts.

In calculating individual state targets, EPA had proposed taking into account each state's energy efficiency potential, but it chose not to do so in the final rules. However, like the proposal, the final plan allows states to use energy efficiency programs for compliance.

EPA also changed its methodology for determining incremental renewable energy to better reflect regional technical potential, rather than state-level renewables policies, as in the proposal.

Unlike in the proposed plan, states with nuclear power plants under construction – Georgia, South Carolina, and Tennessee – will be able to count this generation toward compliance instead of having it factored into their targets.

The final rule also takes the interstate nature of the electric system into greater consideration. The proposal calculated state targets by applying building blocks to each state. The final rule uses the characteristics and potential of electric grid intercon-

nections (Eastern, Western and Texas) to determine emission performance rates for units, which are then applied to each state's unique generation mix to calculate a target.

HOW CAN STATES REDUCE POWER SECTOR CARBON EMISSIONS?

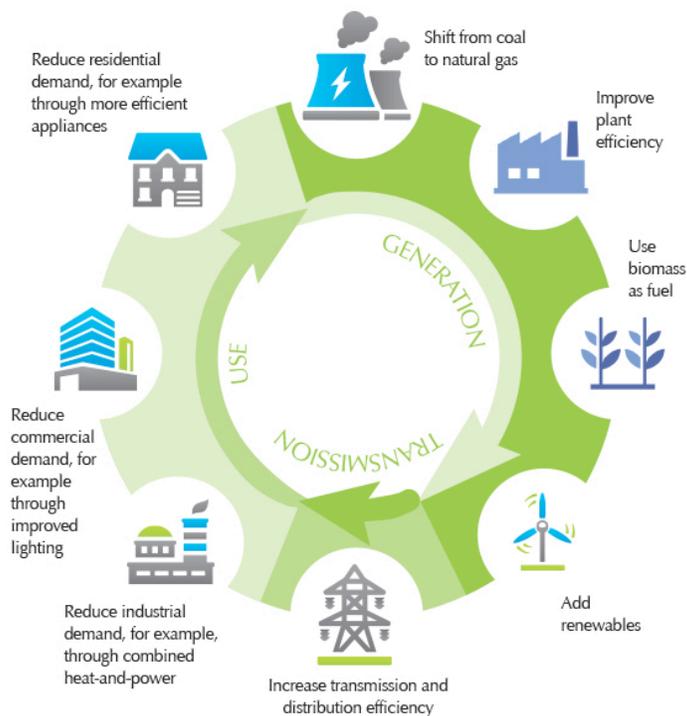
States have wide latitude in designing their strategies to reduce emissions. In most cases, they will rely on a variety of measures. Major options include substituting natural gas for coal; improving energy efficiency; and increasing reliance on renewable energy.

States can implement the Clean Power Plan individually or in cooperation with other states. They also can employ market-based mechanisms, such as averaging or trading, to help power companies identify least-cost emission reductions.

Examples of steps to reduce carbon dioxide emissions in the power sector are illustrated in Figure 3 and Table 1.

Figure 3: Opportunities to reduce carbon dioxide emissions in the power sector

Opportunities to reduce carbon emissions in the power sector



HOW COULD STATES USE MARKET-BASED APPROACHES TO IMPLEMENT THE PLAN?

Economists consider [market-based approaches](#) to be the most efficient way to reduce greenhouse gas emissions.

The Clean Power Plan encourages states to consider using market mechanisms, which could include a cap-and-trade program, a carbon tax, or tradable renewables or efficiency certificates.

EPA intends to set up and administer a program to track trading programs for states that choose to use them. In addition, the [Federal Implementation Plan](#) that EPA would employ in states without adequate plans includes market-based programs, which can be used by states as a model for their own plans.

Under EPA's proposed new Clean Energy Incentive Pro-

gram, states that act early to cut carbon pollution, either with renewables or energy efficiency, would be rewarded with emission reduction credits (ERCs), which they could use to meet their targets or sell to other emitters.

HOW CAN STATES WORK TOGETHER TO IMPLEMENT THE CLEAN POWER PLAN?

States have long collaborated to achieve energy and environmental goals. The successful [trading program](#) to reduce sulfur dioxide, which causes acid rain, is an example.

The plan is designed to facilitate interstate compliance strategies, including different forms of trading. The federal implementation plan outlines strategies to determine the equivalence of emission reduction credits in different states. It would also create a national platform that can be used to track the buying,

Table 1: Policy options to reduce power sector carbon dioxide emissions

POLICY	DESCRIPTION	EXAMPLES
<i>Power plant performance standard</i>	Each power plant must achieve a set emissions intensity	California, New York, Washington
<i>Renewable Portfolio Standard</i>	Utilities must deliver a set percentage of renewable electricity	Colorado, Hawaii, Kansas, Missouri, Nevada, Rhode Island, and others
<i>Energy Efficiency Resource Standard</i>	Utilities must cut demand by a set amount by target years	Arizona, Connecticut, Maryland, Minnesota, Texas, and others
<i>Decoupling</i>	Reduce utility incentive to deliver more electricity by decoupling revenue and profit	California, Idaho, Massachusetts, Michigan, Oregon, and others
<i>Net Metering</i>	Encourage residential solar by paying homeowners to put excess electricity back on grid	Arkansas, Colorado, Georgia, Louisiana, and others
<i>Cap & Trade</i>	Issue a declining number of carbon allowances, which must be surrendered in proportion to each plant's emissions	California, Regional Greenhouse Gas Initiative
<i>Carbon Tax</i>	Charge a tax for emitting carbon	British Columbia
<i>Grid Operator Carbon Fee</i>	Add a carbon price to grid operator decision over which power plants to run	None currently
<i>Appliance Efficiency Standards</i>	Require new appliances sold to meet set electricity consumption standards	California, Florida, New Jersey, and others
<i>Commercial & Residential Building Codes</i>	Require new buildings to include electricity saving measures	California, Illinois, Maryland, Mississippi, and others

selling, and trading of credits across state lines.

An example of states already working together is the [Regional Greenhouse Gas Initiative](#) in the Northeast. A multi-state approach could also be accomplished through another existing authority such as a Regional Transmission Organization (RTO) or Independent System Operator (ISO).

WILL STATES BE ABLE TO USE CANADIAN HYDROPOWER TO COMPLY?

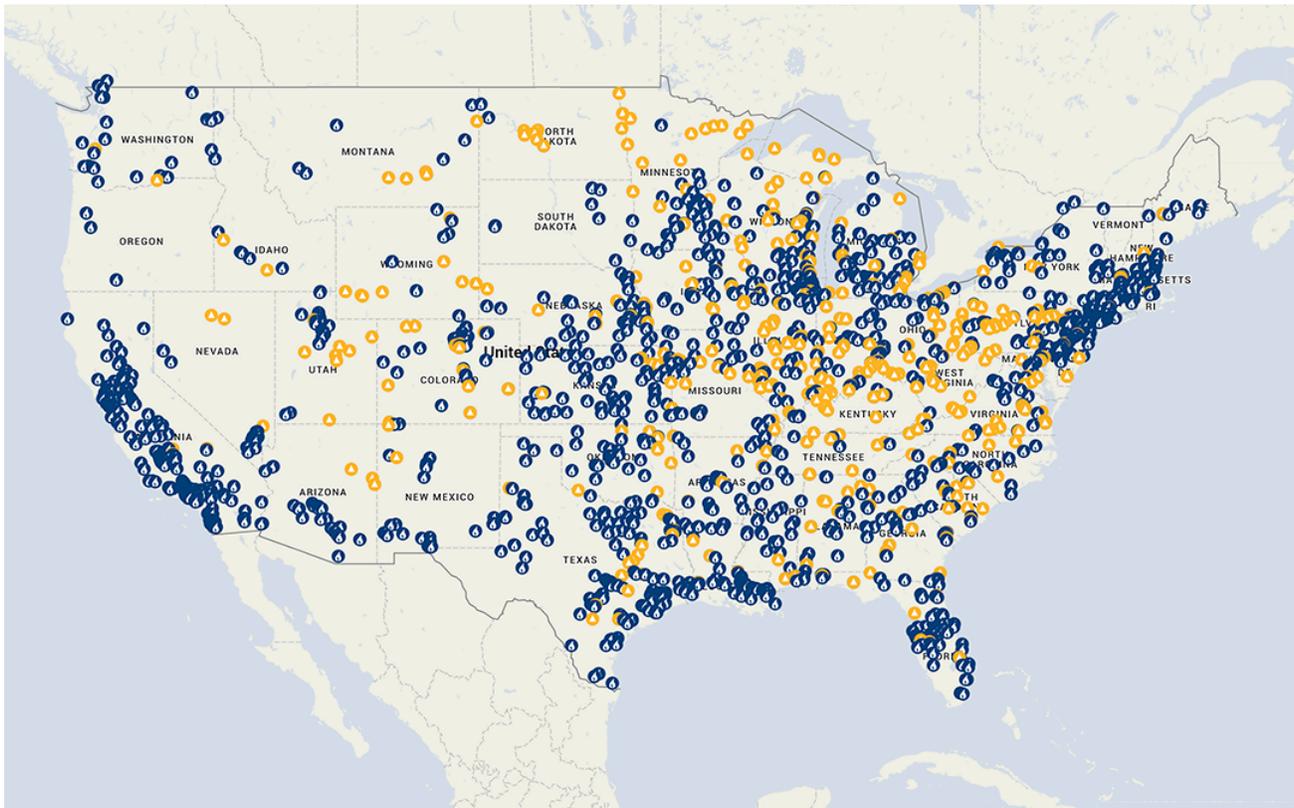
Renewable energy from outside of the United States, including Canadian hydropower, can be used for compliance purposes, provided it is incremental and installed after 2012 and meets some other conditions. More than a dozen U.S. states already import a significant amount of Canadian hydropower. According to a [C2ES report](#), importing hydropower from even a modestly sized new Canadian project (250 MW) could help a state bridge the gap between its current carbon emissions rate and its 2030 target.

WILL THE CLEAN POWER PLAN AFFECT THE RELIABILITY OF THE ELECTRIC GRID?

In response to concerns raised by EPA's proposed rule, the final plan includes a "reliability safety valve" temporarily relaxing emission standards on individual electric generating units under extraordinary circumstances where electric system reliability is concerned.

To mitigate reliability issues, states are required to address reliability in their compliance plans. Importantly, the plan gives states up to seven years before interim targets must be met, providing time for state regulators and reliability entities to work with utilities and other key stakeholders.

The plan is also expected to encourage energy efficiency, which helps lower demand growth and improve reliability.

Figure 4: Distribution of Fossil Fuel Power Plants across the Contiguous United States

Source: U.S. Energy Information Administration, "U.S. Energy Mapping System," last accessed February 12, 2015, <http://www.eia.gov/state/maps.cfm>.

HOW MUCH WILL IMPLEMENTING THE PLAN COST?

[EPA calculates](#) that savings from increased energy efficiency will outweigh the costs of implementing the plan, reducing household electric bills by about \$7 per month by 2030. The agency estimates compliance costs of \$5.1 billion to \$8.4 billion and total benefits of \$34 billion to \$54 billion.

HOW DOES THE PLAN ADDRESS NUCLEAR POWER?

Nuclear provides nearly 20 percent of the nation's power and is the largest source of carbon-free baseload electricity. Five reactors are now under construction in Tennessee, Georgia and South Carolina and are expected to be online by 2030.

Unlike the proposal, the final rule does not consider existing or new nuclear power for the purposes of setting state targets.

Therefore, the five reactors under construction and any new units or upgrades can count toward compliance.

HOW IS NATURAL GAS TREATED IN THE PLAN?

Both the proposal and the final plan envision about a third of U.S. electricity coming from natural gas in 2030. However, under the final plan, less new natural gas generation capacity is anticipated.

Natural gas demand was expected to grow more quickly under the earlier compliance date called for in the proposed rule. Proposed incentives for early deployment of renewables may encourage more investment in renewable energy in the short term.

WHAT DOES THIS PLAN MEAN FOR COAL?

Demand for coal in the U.S. has been decreasing for many years because of the availability of relatively less expensive natural gas to meet baseload power demands and because of other environmental and safety regulations. Even before the Clean Power Plan, very few new coal plants were expected to be constructed. According to EPA's IPM modeling of the final rule, coal is expected to make up 27 to 28 percent of the electric generation mix in 2030. Under a business-as-usual scenario, coal is expected to deliver 36 percent of U.S. electricity in 2030.

WHAT DOES THE SUPREME COURT STAY MEAN FOR THE REGULATION?

The Supreme Court granted a stay in response to a legal challenge from some states, utilities and coal companies, who argued that EPA's regulation was burdensome. Other states and utilities are participating in the legal challenge by supporting EPA. The court's decision puts implementation of the rule on hold while a lower court decides the merits of the challenge.

EPA's authority to regulate greenhouse gases is settled. The issue is whether EPA's particular approach is appropriate.

Whether or not the courts ultimately uphold this particular rule, the legal requirement to cut carbon emissions will remain, and states need to determine the most cost-effective ways to do that. A number of states challenging the rule in court have been simultaneously working on their implementation plans and are likely to continue to do so. If the plan is upheld, the implementation timeline may have to be extended.

Regardless of the ultimate legal outcome, the broader trends favor continued momentum toward stronger climate action.

WHAT IS THE TIMETABLE FOR IMPLEMENTING THE PLAN?

Before the stay was issued, states had until September 2016 to either submit a plan or request an extension. All final plans were due by September 2018. EPA would approve or disapprove a final plan within a year.

The Clean Energy Incentive Program was to begin on January 1, 2020. States that had expressed their interest in participating in this program in their final plans were eligible. This program was to run throughout 2020 and 2021.

On January 1, 2022, states were to begin complying by meeting their interim targets and had to meet their final CO₂ reduction goals by January 30, 2030.

During the period of the stay, no deadlines are binding, and they may be extended when the legal challenge is resolved.

WHAT HAPPENS TO STATES THAT FAIL TO COMPLY?

States were given up to three years to write implementation plans, applying their knowledge of their utilities and the programs that have worked in the past.

Under the Clean Air Act, any state that would fail to submit a plan or get EPA approval for its plan would be subject to a federal implementation plan. The current proposals for the [federal implementation plan](#) would use flexible, market-based solutions for compliance.



The Center for Climate and Energy Solutions (C2ES) is an independent nonprofit organization working to promote practical, effective policies and actions to address the twin challenges of energy and climate change.