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EPA's Clean Power Plan: Highlights of the Final Rule

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Summary

On August 3, 2015, the Environmental Protection Agency (EPA) finalized regulations that address carbon dioxide (CO_2) emissions in the electric power sector. The Clean Power Plan (CPP) final rule requires states to submit plans that would reduce carbon dioxide (CO_2) emissions or emission rates—measured in pounds of CO_2 emissions per megawatt-hour of electricity generation—from existing fossil fuel electricity generating units. EPA estimates that in 2030, the CPP will result in CO_2 emission levels from the electric power sector that are 32% below 2005 levels.

The CPP is the subject of ongoing litigation in which a number of states and other entities have challenged the rule. On February 9, 2016, the Supreme Court stayed the CPP for the duration of the litigation. The CPP therefore currently lacks enforceability or legal effect, and if the rule is ultimately upheld, at least some of the deadlines would have to be delayed.

For example, the final rule established a deadline of September 6, 2016, for states to submit to EPA plans to comply with the rule with the option for a two-year extension (September 6, 2018). If a state fails to submit a satisfactory plan by EPA's regulatory deadline, the Clean Air Act directs EPA to prescribe a plan for the state, often described as a federal implementation plan.

Emission reductions are scheduled to begin in 2022, giving the states two additional years (compared to the proposed rule) before their plans must go into effect.

The 2015 final rule's state-specific targets are substantially different from those in the 2014 EPA proposed rule. For example, EPA's final rule establishes uniform national CO_2 emission performance rates for each of the two subcategories of electricity generating units—fossil-fuel-fired electric steam generating units (whether coal, oil, or natural gas) and stationary combustion turbines (natural gas combined cycle)—affected by the rule. These standards are the underpinnings for the state-specific emission rate and mass-based targets, which, as a result, are considerably different from the proposed rule.

The final rule's state targets imply lower percentage reductions for some states, while implied percentage reductions are higher for others states compared to the proposed rule. The state-specific targets differ, because EPA altered its methodology (i.e., underlying calculations and assumptions) compared to the proposed rule. For example, EPA eliminated "building block" 4 (energy efficiency improvements) and other "building blocks."

In the final rule, EPA continues to use 2012 data as the baseline for calculated state targets. However, the agency made several state-specific adjustments to address concerns raised by stakeholders.

EPA also modified its treatment of nuclear power in the final rule, removing both "at risk" and under-construction nuclear power from the emission rate calculations. EPA clarified that the final rule would allow the generation from under-construction units, new nuclear units, and capacity upgrades to help states meet their compliance objectives.

EPA would allow states to use "qualified biomass" as a means of meeting state-specific reduction requirements. This appears to be a narrower approach to biomass than in the proposed rule.

The final rule contains a provision for a reliability "safety valve" for individual power plants. This mechanism would allow for a 90-day reprieve from emissions limits in an emergency situation.

In addition, EPA created a new program to encourage states to support renewable energy and energy efficiency projects (in low-income communities) in 2020 and 2021.

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Introduction

On August 3, 2015, the Environmental Protection Agency (EPA) finalized regulations to address carbon dioxide (CO_2) emissions—or CO_2 emission rates—at existing electricity generating units (EGUs).[1] The rule, known as the Clean Power Plan (CPP), appeared in the *Federal Register* on October 23, 2015.[2]

EPA cites Section 111(d) of the Clean Air Act (CAA)[3] as the statutory authority for the rulemaking. EPA estimates that in 2030, the CPP will result in a 32% reduction in CO_2 emissions from the electric power sector in the United States compared to 2005 levels.[4]

Mass-Based Targets and Emission Rate Targets

A key decision states face under the CPP is whether to meet compliance with a mass-based target or an emission rate target. An emission rate target is measured in pounds of CO_2 emissions per megawatt-hour (MWh) of electricity generation. A mass-based target is measured in short tons of CO_2 emissions. In its CPP final rule, EPA calculates state-specific emission rate targets and uses those targets to generate equivalent state-specific mass-based targets.

The CPP has generated considerable controversy and garnered interest from Congress and a wide range of stakeholders. After EPA proposed the CPP in 2014,[5] the agency received more than 4.2 million public comments. Some Members in the 114th Congress have made several attempts to block the implementation of the CPP. In particular, after EPA published its CPP final rule in 2015, both the Senate and the House passed a resolution of disapproval pursuant to the Congressional Review Act.[6] President Obama vetoed the resolution in December 2015. If enacted, the resolution would have prohibited the CPP rulemaking from taking effect.

The CPP is the subject of ongoing litigation in which a number of states and other entities have challenged the rule, while other states and entities have intervened in support of the rule. Opponents of the rule applied to the Supreme Court in late January 2016 for an immediate stay of the CPP final rule. In a move that surprised many observers, the Supreme Court issued a stay of the final rule until the legal challenges have been resolved.[7] Therefore, the CPP deadlines (discussed below) do not have legal effect and will likely be delayed if the rule is ultimately upheld.

This report provides a brief analysis of EPA's final rule, summarizing highlights and identifying differences between the final and proposed rules. The topics discussed do not represent an

[1] In general, an affected EGU is a fossil-fuel-fired unit (e.g., coal, oil, or natural gas) that was in operation or had commenced construction as of January 8, 2014; has a generating capacity above a certain threshold; and sells a certain amount of its electricity generation to the electric grid.

[2] EPA, "Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units," Final Rule, 80 *Federal Register* 64661 (hereinafter "Final rule"), October 23, 2015.

[3] 42 U.S.C. §7411(d).

[4] Final rule, p. 64665. See also EPA, *Regulatory Impact Analysis for the Clean Power Plan Final Rule*, August 2015.

[5] EPA, "Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units," Proposed Rule, 79 *Federal Register* 34830, June 18, 2014.

[6] The Senate passed Senate Joint Resolution 24 on November 17, 2015. The House passed the same resolution on December 1, 2015.

[7] Order in Pending Case, West Virginia v. EPA, No. 15A773 (S. Ct. Feb. 9, 2016), https://www.supremecourt.gov/orders/courtorders/020916zr1_8mj9.pdf.

exhaustive list of the differences from the proposed rule or the support or opposition that may be raised by various stakeholders. This report does not provide a legal analysis of the final rule.

For a more comprehensive analysis of the CPP, see CRS Report R44341, *EPA's Clean Power Plan for Existing Power Plants: Frequently Asked Questions*, by James E. McCarthy et al. For a detailed discussion of the legal issues, see CRS Report R44480, *Clean Power Plan: Legal Background and Pending Litigation in West Virginia v. EPA*, by Alexandra M. Wyatt.

In addition, other CRS reports provide more detailed information about particular topics related to the CPP:

- CRS Report R44607, *EPA's Clean Energy Incentive Program: Background and Legal Developments*, by Jonathan L. Ramseur and Linda Tsang.
- CRS Report R44451, *U.S. Carbon Dioxide Emission Trends and the Role of the Clean Power Plan*, by Jonathan L. Ramseur.
- CRS Insight IN10578, *Coal Use Already Near EPA's 2030 Projection*, by James E. McCarthy.
- CRS Report R44265, *EPA's Clean Power Plan: Implications for the Electric Power Sector*, by Richard J. Campbell.
- CRS In Focus IF10280, *The Clean Power Plan (CPP): The Treatment of Biomass*, by Kelsi Bracmort.

Final Rule Highlights

State Plan Requirements and Options[8]

Under Section 111(d) of the Clean Air Act (CAA), states must establish performance standards that reflect the "best system of emission reduction" (BSER) that the EPA Administrator determines has been adequately demonstrated, taking into account costs and any non-air-quality health and environmental impacts and energy requirements.

The final rule requires states to submit to EPA either an initial plan or final plan by September 6, 2016. States can submit either individual plans or multi-state plans. If a state submits an initial plan in 2016, the state can seek an extension from EPA to submit its final plan by September 6, 2018. If EPA grants the extension, the state must submit a progress report by September 6, 2017. By comparison, the proposed rule would have allowed states to receive a one-year extension for submitting their final plan and a two-year extension if states submitted a multi-state plan.

The final rule allows states to select from two types of plans, described by EPA as (1) an "emission standards" approach or (2) a "state measures" approach.[9] If a state chooses the emission standards approach, the state would implement the federally enforceable emission rate standards (discussed below) directly at the affected EGUs in the state. This approach could involve multiple states and an emission rate trading system or a mass-based trading system.

A state measures approach allows a state to achieve the equivalent of the CO_2 emission standards approach by using some combination of federally enforceable standards for EGUs and elements

[8] The deadlines discussed in this section do not currently have legal effect and because of the February 9, 2016, stay by the Supreme Court will likely be delayed if the rule is ultimately upheld.

[9] Final rule, p. 64832; see also EPA, *The Role of States: States Decide How to Achieve Their Goal*, August 2015, http://www.epa.gov/airquality/cpp/fs-cpp-states-decide.pdf.

that would be enforceable only under state laws. Examples of such elements include renewable energy and/or energy efficiency requirements that could be applied to affected EGUs or other entities. A plan that employs the state measures approach requires the inclusion of federally enforceable standards that would take effect if the state measures approach did not achieve the required result. If a state uses the state measures approach, the state must use a mass-based target "to provide certainty that the state measures are achieving the required emission reductions."[10] Multi-state systems are allowed with this approach as well.[11]

Federal Implementation Plan

EPA cannot compel a state to submit a state plan pursuant to CAA Section 111(d). If a state fails to submit a satisfactory plan by EPA's regulatory deadline, CAA Section 111(d) directs EPA to prescribe a plan for the state, often described as a federal implementation plan (FIP).

On the same day (August 3, 2015) that EPA released its CPP final rule, EPA released a proposed rule that presents two options for a FIP: (1) a rate-based trading program, and (2) a mass-based trading program.[12] This proposal appeared in the *Federal Register* on October 23, 2015.[13] As of the date of this report, EPA has not finalized this rule.

A FIP would require compliance by individual EGUs in the affected state and would establish a trading program that could be used by affected EGUs to meet those limits. According to EPA, the stringency of the federal plan would be the same as the national CO_2 emission performance rates specified in the CPP.[14]

Timing Requirements for State Targets

EPA's final rule directs states to establish interim targets that would be measured between 2022 and 2029. EPA's proposed CPP rule set an interim target to be achieved "on average" between 2020 and 2029. Thus, the final rule effectively gives the states an additional two years before reductions are necessary.

In addition, the final rule requires states to demonstrate their progress in implementing a gradual application of BSER with "glide paths" that the states identify for reductions in three time periods: 2022-2024, 2025-2027, and 2028-2029. The interim target is, nonetheless, to be achieved using the average of the eight-year interim period.

National Performance Standards

A major change in EPA's final rule compared with the proposed rule is its core of what EPA called "a traditional, performance-based approach to establishing emission guidelines for affected sources."[15] The final rule establishes uniform national CO_2 emission performance rates (measured

[10] Final rule, p. 64827.

[11] Nine states in the Northeast and Mid-Atlantic regions have established a program, which took effect in 2009, to control CO_2 emissions from power plants. For more details, see CRS Report R41836, *The Regional Greenhouse Gas Initiative: Lessons Learned and Issues for Congress*, by Jonathan L. Ramseur.

[12] Available at http://www.epa.gov/airquality/cpp/cpp-proposed-federal-plan.pdf.

[13] EPA, "Federal Plan Requirements for Greenhouse Gas Emissions from Electric Utility Generating Units Constructed on or Before January 8, 2014; Model Trading Rules; Amendments to Framework Regulations," Proposed Rule, 80 *Federal Register* 64966, October 23, 2015.

[14] See the proposed FIP, p. 64970.

[15] Final rule, p. 64707.

in pounds of CO_2 per MWh of electricity generation) for each of the two subcategories of EGUs—fossil-fuel-fired electric steam generating units (e.g., coal, oil, or natural gas units) and stationary combustion turbines (e.g., natural gas combined cycle units)—affected by the rule. These standards are the underpinnings for the state-specific emission rates and mass-based targets. The methodology for these targets is discussed below.

State-Specific Targets

EPA's final rule contains state-specific emission rate targets and mass-based targets. These targets apply to the state's total electricity portfolio (which can include generation from renewables and nuclear power), not the individual units, as with the national performance standards (above). The interim and final targets, however, differ from the ones in the proposed rule. **Table A-1** lists each state's 2012 baseline, its 2030 emission rate target, and the implied percentage reduction required to achieve the 2030 target. The mass-based targets are based on the emission rate targets and are provided in **Table A-2**.

For comparison purposes, **Table A-1** also lists the same information from the proposed rule. The final rule implies lower percentage reduction requirements for some states and implies higher percentage reduction requirements for others compared to the proposed rule.[16]

Figure 1 compares the state-specific emission rate targets in 2030 (the dark-colored columns) with the state-specific emission rate baselines in 2012 (the combined dark- and light-colored columns). The light-colored columns illustrate the emission rate reductions required by 2030. The states on the left side of the figure have the largest emission rate reduction requirements compared to their 2012 baseline; the states on the right side have the smallest reduction requirement.

EPA did not establish emission rate goals for Vermont and the District of Columbia because they do not currently have affected EGUs. In its final rule, EPA stated that Alaska, Hawaii, and the two U.S. territories with affected EGUs (Guam and Puerto Rico) will not be required to submit state plans on the schedule required by the final rule. EPA asserts it "does not possess all of the information or analytical tools needed to quantify" the BSERs for these areas. EPA stated it will "determine how to address the requirements of section 111(d) with respect to these jurisdictions at a later time."[17]

In addition, EPA crafted emission rate targets for three areas of Indian country. The tribes have "the opportunity, but not the obligation," to establish and submit plans to meet their emission rate targets. If a tribe does not seek authority to submit its own plan, EPA is responsible for establishing a plan if the agency determines at a later date that "a plan is necessary or appropriate."[18]

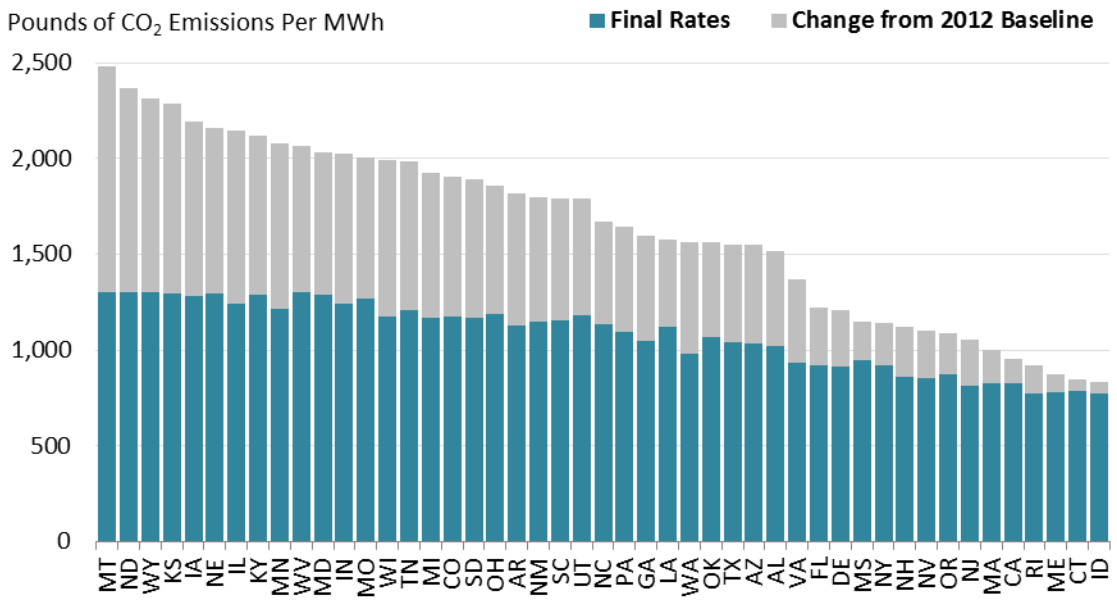
[16] EPA's final rule does not specifically require percentage reductions. States would reduce their emissions or emission rates by a certain percentage (compared to their baselines) if they meet their compliance obligation. Hence, CRS uses the term "implies."

[17] Final rule, p. 64743.

[18] Final rule, p. 64709.

Figure 1. State-Specific Emission Rate Targets in 2030 Compared to 2012 Emission Rate Baselines

States Listed in Order of Their 2012 Emission Rate Baselines (High to Low)



Source: Prepared by CRS; final rule target and baseline data from EPA, *CO_2 Emission Performance Rate and Goal Computation Technical Support Document for CPP Final Rule* (August 2015) and accompanying spreadsheets, http://www2.epa.gov/cleanpowerplan/clean-power-plan-final-rule-technical-documents.

Note: The dark-colored columns illustrate the state-specific emission rate targets in 2030. The combined dark- and light-colored columns illustrate the state-specific emission rate baselines in 2012. The light-colored columns illustrate the emission rate reduction requirements states must achieve by 2030.

EPA's Methodology

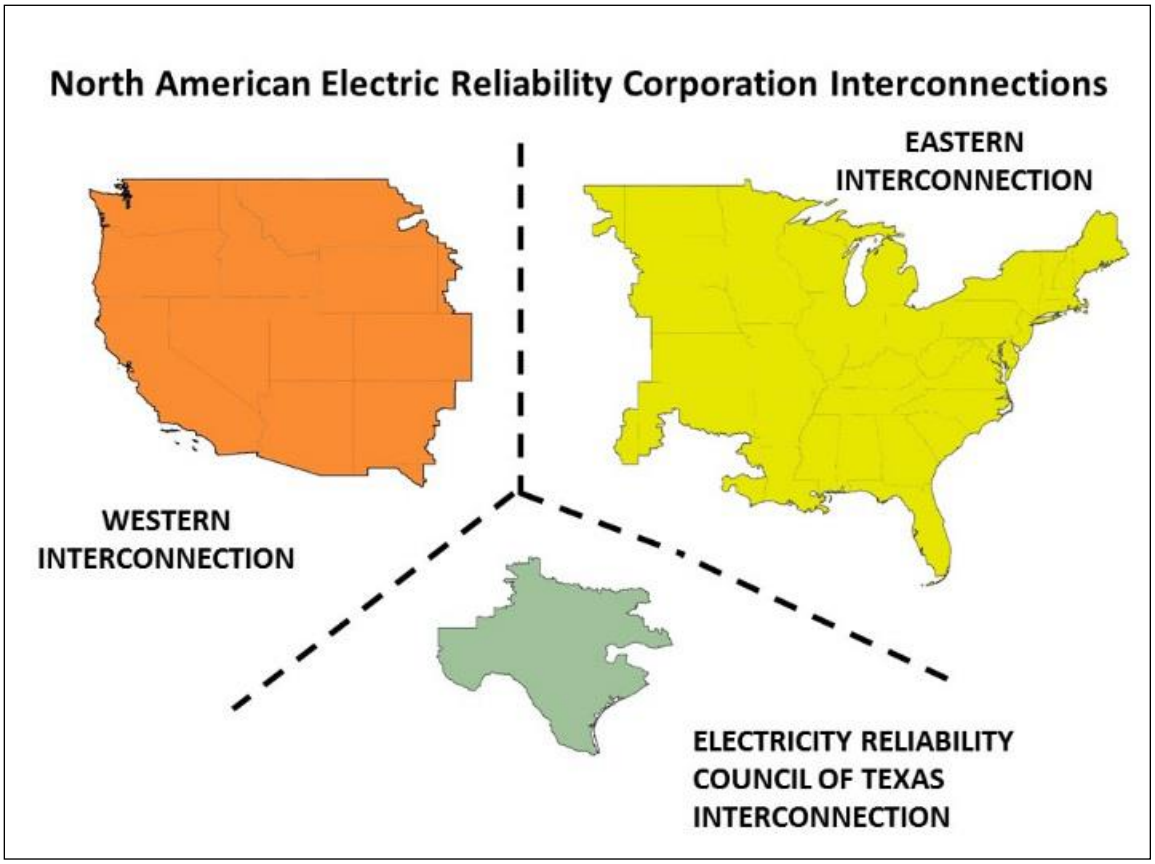
The methodology (i.e., underlying calculations and assumptions) in the final rule that EPA used to create (1) the national CO_2 emission performance rates and (2) the state-specific emission rate and mass-based targets is considerably different from EPA's methodology in its proposed rule. Although an in-depth comparison between the two approaches is beyond the scope of this report,[19] some initial observations are included below.

National Performance Standards

In its final rule, EPA established CO_2 emission performance standards for two subcategories of affected sources: (1) fossil-fuel-fired electric steam generating units (e.g., coal- and oil-fired units) and (2) stationary combustion turbines—namely, natural gas combined cycle (NGCC) units. To derive the BSER on which these rates were based, EPA divided the states into three regions, illustrated in **Figure 2**, and compiled 2012 data—CO_2 emissions and electricity generation—from each source in each state.

[19] For a detailed analysis of the proposed rule's methodology, see CRS Report R43652, *State CO2 Emission Rate Goals in EPA's Proposed Rule for Existing Power Plants*, by Jonathan L. Ramseur.

Figure 2. Regions in EPA's Methodology



Source: Reproduced from EPA, *Overview of the Clean Power Plan: Cutting Carbon Pollution from Power Plants*, August 2015, http://www.epa.gov/airquality/cpp/fs-cpp-overview.pdf. The figure has a minor error, as the Texas region should be labeled as the Electric Reliability Council of Texas (ERCOT) Interconnection.

Notes: EPA did not establish emission rate goals for Vermont and the District of Columbia because they do not currently have affected EGUs. Although Alaska and Hawaii had targets in the proposed rule, in its final rule, EPA stated that Alaska, Hawaii, and the two U.S. territories with affected EGUs (Guam and Puerto Rico) will not be required to submit state plans on the schedule required by the final rule, because EPA "does not possess all of the information or analytical tools needed to quantify" the best system of emission reduction for these areas. EPA stated it will "determine how to address the requirements of section 111(d) with respect to these jurisdictions at a later time."

Building Blocks

Both the final and proposed rules included "building blocks" in the underlying calculations. In its final rule, EPA applied three building blocks to the aggregated regional data:

- Building block 1: EPA applied heat rate improvements to coal-fired EGUs, improving their overall emission rate. The improvements vary by region from 2.1% to 4.3%.
- Building block 2: EPA assumed that NGCC generation would increase to a specific ceiling, displacing an equal amount of generation from steam units (primarily coal). Note that in the final rule, EPA applies building block 3 before building block 2, dampening the impact of building block 2.

- Building block 3: EPA projected annual increases in renewable energy generation, which resulted in corresponding decreases in generation from affected EGUs. EPA based the future increases on renewable energy generation increases between 2010 and 2014.

In its final rule, EPA eliminated building block 4 (demand-side energy efficiency improvements in the commercial and residential sectors) and modified the components in building blocks 1-3. In particular, the renewable energy assumptions (building block 3) changed dramatically in the final rule. According to EPA, the final rule's renewable energy generation level in 2030 is more than twice the level in the proposed rule.[20] In addition, EPA assumed a coal-fired plant efficiency improvement of 6% in the proposed rule (building block 1), while the final rule includes region-specific improvements that range from 2.1% to 4.3%. The natural gas generation assumptions in building block 2 changed as well.

EPA's building block application produced annual CO_2 emission performance rates for steam and NGCC units in each region. EPA compared the rates in each of the three regions and chose the least stringent regional rate as the national standard for that particular year for each EGU category (**Table 1**).

Table 1. National CO_2 Performance Rates

Pounds of CO_2 per Megawatt-hour

	2022	2023	2024	2025	2026	2027	2028	2029	2030	Interim (Average of 2022-2030)	Final (2030)
Fossil steam units	1,741	1,681	1,592	1,546	1,500	1,453	1,404	1,355	1,304	1,534	1,305
NGCC units	898	877	855	836	817	798	789	779	770	832	771

Source: Prepared by CRS; annual rates from EPA, *CO2 Emission Performance Rate and Goal Computation Technical Support Document for CPP Final Rule* (August 2015).

Note: To generate the final rates, EPA used the 2030 rates and rounded up to the next integer.

Emission Rate and Mass-Based Target Creation

To generate state-specific emission rate targets, EPA applied the annual performance rates to each state's baseline (2012) fossil fuel generation mix (steam generation vs. NGCC generation).

For example, in 2012, Arizona's electricity generation mix included 49% steam generation, and 51% NGCC generation. To calculate Arizona's 2030 emission rate target, EPA multiplied the percentage of each generation type by the corresponding 2030 national CO_2 emission performance rate (**Table 1**):

(49% * 1,305 lbs. CO_2/MWh) + (51% * 771 lbs. CO_2/MWh) = 1,031 lbs. CO_2/MWh

The state-specific emission rate targets are listed in **Table A-1**.

EPA used the state-specific emission rate targets to calculate mass-based targets for each state. This conversion process is more complicated. First, EPA multiplied a state's emission rate target

[20] See EPA, *Greenhouse Gas Mitigation Measures*, Technical Support Document, August 2015, p. 4-11, https://www.epa.gov/sites/production/files/2015-11/documents/tsd-cpp-ghg-mitigation-measures.pdf.

(lbs. CO_2/MWh) for a particular year (e.g., 2022) by the state's 2012 CO_2 generation baseline (MWh). This yields an initial mass-based value for that year (lbs. CO_2). Second, EPA determined the amount of renewable energy generation (pursuant to building block 3) that would not be needed to achieve the emission rate targets. This "excess" renewable energy generation is available because EPA chose the least stringent of the three regional CO_2 performance rates as the national CO2 performance rate. EPA calculated the CO_2 emissions associated with this "excess" generation and allocated the CO_2 emissions to all of the states based on their 2012 generation, increasing their annual mass-based targets. As a result, some of the states' 2030 mass-based targets are higher than their 2012 emission baselines.

Table A-2 lists the state-specific, mass-based targets from EPA's final rule. The table compares the 2030 targets with the 2012 baselines as calculated for the final rule and provides a percentage change between the two values.

2012 Baseline

After EPA's proposed rule in June 2014, multiple states and stakeholders raised a variety of concerns with EPA's use of 2012 as the baseline year to calculate the emission rate targets. In both its proposed and final rules, EPA uses 2012 as the baseline year in its emission rate and mass-based target calculations. However, EPA made several state-specific adjustments in the final rule to address some of the concerns. Perhaps the most substantial adjustments are in states that generate a significant percentage of electricity from hydropower. According to EPA, 2012 was an "outlier" year for snowpack, resulting in relatively high use of hydropower and a corresponding decrease in fossil fuel generation in particular states.[21] As **Table A-1** indicates, this adjustment seemed to have a considerable impact in states that use a high percentage of hydropower: Washington, Oregon, Idaho, and Maine. In addition, EPA made other state-specific adjustments for EGUs that came online during 2012.

Renewable Energy Treatment

Renewable energy played a significant role in the proposed rule, and its role appears to be even greater in the final rule. Although an in-depth analysis of renewable energy in the final rule is beyond the scope of this report, a comparison of estimated results from the Regulatory Impact Analyses (RIA) accompanying the proposed and final rules indicates a substantial increase in EPA's analysis of renewable energy's contribution to the nation's electricity portfolio by 2030. For example, in the proposed rule RIA, non-hydro renewable energy generation was projected to increase by 2% in 2030, compared to a business-as-usual scenario.[22] In the final rule RIA, non-hydro renewable energy generation was projected to increase by 9% in 2030 (under a rate-based scenario), compared to a business-as-usual scenario.[23] EPA explained that this difference resulted from both its revised methodology in the final rule and updated economic data for renewable energy, which included substantially lower cost estimates for project installation.[24]

[21] Final rule, starting on p. 64815.

[22] EPA, *Regulatory Impact Analysis for the Proposed Carbon Pollution Guidelines for Existing Power Plants and Emission Standards for Modified and Reconstructed Power Plants*, June 2014, Table 3-11.

[23] EPA, *Regulatory Impact Analysis for the Clean Power Plan Final Rule*, August 2015, Table 3-11.

[24] EPA, *Greenhouse Gas Mitigation Measures*, August 2013.

In addition, renewable energy is included in a new voluntary program that EPA developed for the final rule. This program would provide incentives to states to develop renewable energy projects in 2020 and 2021 (discussed below).

Energy Efficiency Treatment

As mentioned above, EPA's final rule does not include demand-side energy efficiency (EE) improvements in its emission rate methodology. In EPA's proposed rule, EE improvements were addressed in building block 4. The impacts of building block 4 on emission rate targets varied by state.[25] In general, the effects appeared more pronounced in states that generate a large percentage of their electricity from sources that were not already included in the proposed rule emission rate equation—primarily hydroelectric power and, to some extent, nuclear power.

In its final rule, EPA explained its reasoning for removing EE from the building blocks:

> [Clean Air Act] section 111 has allowed regulated entities to produce as much of a particular good as they desire provided that they do so through an appropriately clean (or low-emitting) process. While building blocks 1, 2, and 3 fall squarely within this paradigm, the proposed building block 4 does not.[26]
>
> Building block 4 is outside our paradigm for section 111 as it targets consumer-oriented behavior and demand for the good, which would reduce the amount of electricity to be produced.[27]

Although EPA removed EE from its emission rate calculations, states may choose to employ EE improvement activities as part of their plans to meet their targets. In particular, the final rule includes a new voluntary program that provides incentives for early investments (in 2020 and 2021) in EE programs in low-income communities (as discussed below).

Nuclear Power Treatment

EPA modified its treatment of nuclear power in the final rule. In its proposed rule, EPA factored "at risk" nuclear power (estimated at 5.8%)[28] into the state emission rate methodology. As a result, states had an incentive to maintain the at-risk nuclear power generation or their emission rates would increase (all else being equal). The final rule does not include at-risk nuclear generation in its building block calculations. EPA stated:

> It is inappropriate to base the BSER in part on the premise that the preservation of existing low- or zero-carbon generation, as opposed to the production of incremental, low- or zero-carbon generation, could reduce CO_2 emissions from current levels.[29]

In addition, in its final rule, EPA decided not to include under-construction nuclear power capacity in the emission rate calculations. In its proposed rule, EPA identified five under-construction nuclear units at facilities in Georgia, South Carolina, and Tennessee. Including the

[25] See Table 7 in CRS Report R43652, *State CO2 Emission Rate Goals in EPA's Proposed Rule for Existing Power Plants*, by Jonathan L. Ramseur.

[26] Final rule, p. 64673.

[27] Final rule p. 64778.

[28] Using projections from Energy Information Administration, EPA determined that 5.8% of total U.S. nuclear power capacity was at risk of being retired in the near future. See EPA, *GHG Abatement Measures*, Technical Support Document, June 2014, http://www2.epa.gov/sites/production/files/2014-06/documents/20140602tsd-ghg-abatement-measures.pdf.

[29] Final rule, p. 64738.

estimated generation from these anticipated units in the emission rate equation would have substantially lowered the emission rate targets of these three states. If the final rule had retained this feature, and these nuclear units did not complete construction and enter service, these three states would likely have more difficulty achieving their emission rate goals. EPA clarified that the final rule would allow the generation from under-construction units, new nuclear units, and capacity upgrades to help sources meet emission rate or mass-based targets.

Biomass Treatment[30]

In its final rule, EPA would allow states to use "qualified biomass" as a means of meeting state-specific reduction requirements.[31] This appears to be a narrower approach than was taken in the proposed rule. Also, EPA requires additional accounting and reporting requirements if a state decides to use qualified biomass. The agency gives some indication as to which biomass types may qualify:

> The EPA generally acknowledges the CO_2 and climate policy benefits of waste-derived biogenic feedstocks and certain forest- and agriculture-derived industrial byproduct feedstocks.... Use of such waste derived and certain industrial byproduct biomass feedstocks would likely be approvable as qualified biomass in a state plan when proposed with measures that meet the biomass monitoring, reporting and verification requirements.[32]

Clean Energy Incentive Program[33]

EPA established the Clean Energy Incentive Program (CEIP) as a voluntary complement to the CPP. The CEIP is intended to promote early reductions of CO_2 emissions before the CPP is scheduled to take effect in 2022. EPA established the framework of the CEIP in its CPP final rule and published a proposed rule for the CEIP in the *Federal Register* on June 30, 2016.[34] The proposed rule seeks to provide additional detail, clarify certain elements that were previously outlined, and alter some of the program eligibility requirements.

The CEIP would award either emission rate credits or emission allowances for two categories of activities:

1. Energy efficiency and solar renewable energy projects in low-income communities, and
2. Renewable energy projects in participating states.

The CEIP credits take the form of emission rate credits or emission allowances, depending on whether a state chooses an emission rate or mass-based target. The credits/allowances could be sold to or used by an affected emission source to comply with the state-specific emission or emission rate reduction requirements. In a CO_2-constrained regime, these credits/allowances would have monetary value.[35]

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[30] For more information on biomass issues, CRS In Focus IF10280, *The Clean Power Plan (CPP): The Treatment of Biomass*, by Kelsi Bracmort.

[31] EPA defines qualified biomass as a "feedstock that is demonstrated as a method to control increases of CO_2 levels in the atmosphere" (Final rule, p. 64886).

[32] Final rule, p. 64886.

[33] For more details, see CRS Report R44607, *EPA's Clean Energy Incentive Program: Background and Legal Developments*, by Jonathan L. Ramseur and Linda Tsang.

[34] EPA, "Clean Energy Incentive Program Design Details," 81 *Federal Register* 42940, June 30, 2016.

[35] For example, in the Regional Greenhouse Gas Initiative, a CO_2 cap-and-trade program involving nine northeastern

Renewable energy projects would receive one credit/allowance from the state and one credit from EPA for every two MWh of renewable energy generation in 2020 and 2021. Projects in low-income communities would receive double credits: For every two MWh of generation from solar power or avoided electricity generation through energy efficiency, these projects would receive two credits/allowances from the state and two from EPA.

The amount of EPA credits/allowances potentially available to each state participating in the CEIP depends on the relative amount of emission reduction each state is required to achieve. States with greater reduction requirements would have access to a greater share of the EPA credits.

EPA requires state plans to ensure that state-issued credits/allowances for the CEIP will maintain the stringency of the emission or emission rate targets. In contrast, states do not need to account for the matching credits/allowances provided by EPA. The proposed CEIP rule does not provide details as to the source of the EPA's matching pool. In its proposed rule, EPA sought comments from stakeholders on multiple CEIP issues.

Electricity Reliability[36]

EPA's proposed CPP generated substantial interest in the potential effects of the rule on the reliability of the electric power supply. In the final rule, EPA includes several measures to "ensure that it does not interfere with the industry's ability to maintain reliability."[37] In particular, the final rule contains a provision for a reliability "safety valve" for individual power plants.[38] EPA states that there may be a need for an EGU to continue to operate and release "excess emissions" if an emergency situation arises that could compromise electric system reliability. The reliability safety valve allows for a 90-day reprieve from carbon emissions limits. EPA states that the safety valve could be triggered only in an emergency situation. For example, extreme weather events are "of short duration and would not require major—if any—adjustments to emission standards for affected EGUs or to state plans."[39]

In addition, EPA, the Department of Energy, and the Federal Energy Regulatory Commission agreed to coordinate efforts while the state compliance plans are developed and implemented to ensure that the power sector can continue to maintain electric reliability. A formal memorandum expresses their joint understanding of how they will cooperate, monitor, implement, share information, and resolve difficulties that may be encountered.[40]

states, emission allowances have sold at auction at prices between $2 per ton and $7.50 per ton. See auction results at http://rggi.org/market/co2_auctions/results and CRS Report R41836, *The Regional Greenhouse Gas Initiative: Lessons Learned and Issues for Congress*, by Jonathan L. Ramseur.

[36] For more information, see CRS Report R44265, *EPA's Clean Power Plan: Implications for the Electric Power Sector*, by Richard J. Campbell.

[37] Final rule, p. 64861.

[38] Final rule, p. 64671.

[39] Final rule, p. 64878.

[40] *EPA-DOE-FERC Coordination on Implementation of the Clean Power Plan*, August 2015, http://www.ferc.gov/media/headlines/2015/CPP-EPA-DOE-FERC.pdf.

Appendix. Additional Information

Table A-1. State-Specific Emission Rate Targets (2030) and Reduction Requirements Compared to 2012 Baselines

Proposed Rule vs. Final Rule

	Proposed Rule			Final Rule		
State	2012 Emission Rate Baseline	2030 Emission Rate Target	Percentage Change Compared to Baseline	2012 Emission Rate Baseline	2030 Emission Rate Target	Percentage Change Compared to Baseline
	Pounds of CO_2 emissions per MWh					
Alabama	1,444	1,059	27%	1,518	1,018	33%
Alaska	1,351	1,003	26%	Not established	Not established	NA
Arizona	1,453	702	52%	1,552	1,031	34%
Arkansas	1,634	910	44%	1,816	1,130	38%
California	698	537	23%	954	828	13%
Colorado	1,714	1,108	35%	1,904	1,174	38%
Connecticut	765	540	29%	846	786	7%
Delaware	1,234	841	32%	1,209	916	24%
Florida	1,199	740	38%	1,221	919	25%
Georgia	1,500	834	44%	1,597	1,049	34%
Hawaii	1,540	1,306	15%	Not established	Not established	NA
Idaho	339	228	33%	834	771	8%
Illinois	1,894	1,271	33%	2,149	1,245	42%
Indiana	1,924	1,531	20%	2,025	1,242	39%
Iowa	1,552	1,301	16%	2,195	1,283	42%
Kansas	1,940	1,499	23%	2,288	1,293	43%
Kentucky	2,158	1,763	18%	2,122	1,286	39%
Louisiana	1,455	883	39%	1,577	1,121	29%
Maine	437	378	14%	873	779	11%
Maryland	1,870	1,187	37%	2,031	1,287	37%
Massachusetts	925	576	38%	1,003	824	18%
Michigan	1,690	1,161	31%	1,928	1,169	39%
Minnesota	1,470	873	41%	2,082	1,213	42%
Mississippi	1,093	692	37%	1,151	945	18%
Missouri	1,963	1,544	21%	2,008	1,272	37%
Montana	2,246	1,771	21%	2,481	1,305	47%
Nebraska	2,009	1,479	26%	2,161	1,296	40%
Nevada	988	647	35%	1,102	855	22%

	Proposed Rule			Final Rule		
State	**2012 Emission Rate Baseline**	**2030 Emission Rate Target**	**Percentage Change Compared to Baseline**	**2012 Emission Rate Baseline**	**2030 Emission Rate Target**	**Percentage Change Compared to Baseline**
New Hampshire	905	486	46%	1,119	858	23%
New Jersey	928	531	43%	1,058	812	23%
New Mexico	1,586	1,048	34%	1,798	1,146	36%
New York	978	549	44%	1,140	918	19%
North Carolina	1,647	992	40%	1,673	1,136	32%
North Dakota	1,994	1,783	11%	2,368	1,305	45%
Ohio	1,850	1,338	28%	1,855	1,190	36%
Oklahoma	1,387	895	35%	1,565	1,068	32%
Oregon	717	372	48%	1,089	871	20%
Pennsylvania	1,531	1,052	31%	1,642	1,095	33%
Rhode Island	907	782	14%	918	771	16%
South Carolina	1,587	772	51%	1,791	1,156	35%
South Dakota	1,135	741	35%	1,895	1,167	38%
Tennessee	1,903	1,163	39%	1,985	1,211	39%
Texas	1,284	791	38%	1,553	1,042	33%
Utah	1,813	1,322	27%	1,790	1,179	34%
Virginia	1,302	810	38%	1,366	934	32%
Washington	756	215	72%	1,566	983	37%
West Virginia	2,019	1,620	20%	2,064	1,305	37%
Wisconsin	1,827	1,203	34%	1,996	1,176	41%
Wyoming	2,115	1,714	19%	2,315	1,299	44%

Source: Prepared by CRS; proposed rule target and baseline data from EPA, *Goal Computation Technical Support Document* (June 2014) and accompanying spreadsheets, http://www2.epa.gov/carbon-pollution-standards/clean-power-plan-proposed-rule-technical-documents; final rule target and baseline data from EPA, *CO_2 Emission Performance Rate and Goal Computation Technical Support Document for CPP Final Rule* (August 2015) and accompanying spreadsheets, http://www2.epa.gov/cleanpowerplan/clean-power-plan-final-rule-technical-documents.

Notes: EPA did not establish emission rate goals for Vermont and the District of Columbia because they do not currently have affected EGUs. Although Alaska and Hawaii had targets in the proposed rule, in its final rule, EPA stated that Alaska, Hawaii, and the two U.S. territories with affected EGUs (Guam and Puerto Rico) will not be required to submit state plans on the schedule required by the final rule, because EPA "does not possess all of the information or analytical tools needed to quantify" the best system of emission reduction for these areas. EPA stated it will "determine how to address the requirements of section 111(d) with respect to these jurisdictions at a later time."

EPA used different formulas to prepare the 2012 baselines in the proposed and final rules. The final rule baseline includes pounds of CO_2 generated from affected EGUs in each state (the numerator) divided by the electricity generated from these units. The proposed rule baseline included pounds of CO_2 generated from affected EGUs in each state (the numerator) divided by the electricity generated from these units *and* "at-risk" nuclear power and renewable energy generation (the denominator). Including these additional elements in the denominator can yield lower baselines compared to the final rule.

In addition, EPA made several state-specific adjustments to the 2012 baselines in the final rule. In all cases, these adjustments increased the state baselines.

Table A-2. 2012 CO_2 Emission Baselines and 2030 CO_2 Emission Targets

Short Tons—Alphabetical by State

State	2012 CO_2 Emission Baseline	2030 CO_2 Emission Targets	Percentage Change
Alabama	75,571,781	56,880,474	-25%
Alaska	Not established	Not established	Not established
Arizona	40,465,035	30,170,750	-25%
Arkansas	43,416,217	30,322,632	-30%
California	49,720,213	48,410,120	-3%
Colorado	43,209,269	29,900,397	-31%
Connecticut	6,659,803	6,941,523	4%
Delaware	5,540,292	4,711,825	-15%
Florida	124,432,195	105,094,704	-16%
Georgia	62,843,049	46,346,846	-26%
Hawaii	Not established	Not established	Not established
Idaho	1,438,919	1,492,856	4%
Illinois	102,208,185	66,477,157	-35%
Indiana	110,559,916	76,113,835	-31%
Iowa	38,135,386	25,018,136	-34%
Kansas	34,655,790	21,990,826	-37%
Kentucky	92,775,829	63,126,121	-32%
Louisiana	44,391,194	35,427,023	-20%
Maine	2,072,157	2,073,942	0.1%
Maryland	20,171,027	14,347,628	-29%
Massachusetts	13,125,248	12,104,747	-8%
Michigan	69,860,454	47,544,064	-32%
Minnesota	34,668,506	22,678,368	-35%
Mississippi	27,443,309	25,304,337	-8%
Missouri	78,039,449	55,462,884	-29%
Montana	19,147,321	11,303,107	-41%
Nebraska	27,142,728	18,272,739	-33%
Nevada	15,536,730	13,523,584	-13%
New Hampshire	4,642,898	3,997,579	-14%
New Jersey	19,269,698	16,599,745	-14%
New Mexico	17,339,683	12,412,602	-28%
New York	34,596,456	31,257,429	-10%
North Carolina	67,277,341	51,266,234	-24%

State	2012 CO_2 Emission Baseline	2030 CO_2 Emission Targets	Percentage Change
North Dakota	33,757,751	20,883,232	-38%
Ohio	102,434,817	73,769,806	-28%
Oklahoma	52,862,077	40,488,199	-23%
Oregon	9,042,668	8,118,654	-10%
Pennsylvania	119,989,743	89,822,308	-25%
Rhode Island	3,735,786	3,522,225	-6%
South Carolina	35,893,265	25,998,968	-28%
South Dakota	5,121,124	3,539,481	-31%
Tennessee	41,387,231	28,348,396	-32%
Texas	251,848,335	189,588,842	-25%
Utah	32,166,243	23,778,193	-26%
Virginia	35,733,502	27,433,111	-23%
Washington	15,237,542	10,739,172	-30%
West Virginia	72,318,917	51,325,342	-29%
Wisconsin	42,317,602	27,986,988	-34%
Wyoming	50,218,073	31,634,412	-37%

Source: Prepared by CRS using data from EPA, *CO_2 Emission Performance Rate and Goal Computation Technical Support Document for CPP Final Rule* (August 2015). The interim and final targets are codified in 40 C.F.R. Part 60, Subpart UUUU, Table 3.

Notes: EPA did not establish emission targets for Vermont and the District of Columbia because they do not currently have affected EGUs. Although Alaska and Hawaii had targets in the proposed rule, in its final rule, EPA stated that Alaska, Hawaii, and the two U.S. territories with affected EGUs (Guam and Puerto Rico) will not be required to submit state plans on the schedule required by the final rule, because EPA "does not possess all of the information or analytical tools needed to quantify" the best system of emission reduction for these areas. EPA stated it will "determine how to address the requirements of section 111(d) with respect to these jurisdictions at a later time" (EPA, "Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units," Final Rule, 80 *Federal Register* 64743, October 23, 2015).

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