

EPA Proposes Unprecedented Greenhouse Gas Emission Reduction Program

We analyze EPA's novel proposal to regulate greenhouse gas emissions from existing power plants as it will shape its regulation of other industry sectors.

On June 2, 2014, EPA released its long-anticipated proposal to regulate carbon dioxide (CO₂) emissions from existing power plants under Section 111(d) of the Clean Air Act (CAA).¹ EPA's proposed Clean Power Plan (CPP) includes ambitious, mandatory CO₂ reduction targets for each state, designed to achieve nationwide 30 percent CO₂ emission reductions over 2005 levels by 2030. EPA has proposed a novel approach, extending regulations beyond the stationary source itself, which is where EPA has traditionally confined its authority. This rulemaking will set the stage for future greenhouse gas regulations in other industry sectors.

In this White Paper, we outline and analyze what EPA proposed, [key questions about the CPP](#), [the CPP's relationship to existing state programs](#), and the [basis for EPA's proposed state performance goals](#). Finally, we [outline EPA's proposal for modified and reconstructed sources](#), highlight some [remaining challenges or "unfinished business"](#) regarding the CPP, and [explain how interested parties can engage and comment](#). Our [June 5, 2014 webcast](#) also provides additional discussion of these issues.

What EPA Proposed

EPA is proposing to adopt "Rate-Based CO₂ Emission Performance Goals" that would be legally binding on each state. Such states, in turn, would then implement the goals through a state plan. "Rate-Based" performance goal refers to an emission performance goal expressed as carbon intensity, namely pounds of CO₂ per net megawatt hour (lbs/net MWh). Rate-based goals are in contrast to "mass-based" performance goals, which are typically used in cap-and-trade programs and are expressed as a quantity of CO₂ emissions, typically in metric tons of CO₂ equivalent.

EPA is undertaking these actions pursuant to Section 111(d) of the CAA. Section 111(d) is a rarely-used provision that directs EPA to establish procedures enabling states to establish plans for implementing and enforcing performance standards for existing sources of an air pollutant, once EPA has established a standard of performance for new sources of that pollutant.²

Significantly, EPA has calculated and proposed a separate performance goal for each state. EPA asserts it has the authority to set emission rates for each state, and EPA may be inflexible in revising the numerical goals it proposed for each state. EPA calculated such individual state goals by determining what constitutes the best system of emission reduction (BSER),³ and then modelling the emissions from the affected sources in each state assuming that the states adopt a combination of four CO₂ reduction measure "Building Blocks" of BSER goals. As a result, EPA's determination of what constitutes BSER is a

substantial and critical component of the CPP. Table 1 below lists each state’s target and the percentage reduction that this reflects over 2012 emissions rates.

Timing of Reductions

The CPP assigns each state two different rate-based performance goals:

- **Interim goals:** would apply as an average during a 2020-2029 phase-in period⁴
- **Final goals:** must be met by 2030 and maintained on a three-year rolling calendar year average thereafter⁵

Affected Sources

An affected Electric Generating Unit (EGU) is “any fossil fuel-fired EGU that was in operation or had commenced construction as of January 8, 2014” and would otherwise meet the criteria for coverage as a fossil fuel-fired EGU in the New Source Performance Standard (NSPS) new source proposal. Those criteria include:

- Capacity of at least 250 million Btu per hour
- Combustion of fossil fuel for more than 10 percent of its total annual heat output
- Sale of greater than 219,000 MWh per year and one-third of its potential electrical output to a utility distribution system⁶

EPA is soliciting comment on its proposal to combine the two existing source categories for the affected EGUs, 40 C.F.R. Part 60 Subpart Da (Electric Utility Steam Generating Units), and 40 C.F.R. Part 60 Subpart KKKK (Stationary Combustion Turbines), into a single category in order to facilitate emission trading among sources in both categories.⁷

Costs and Benefits

- EPA estimates that the net benefits (including both climate benefits and air pollution health co-benefits) of the CPP will be between US\$48 to 84 billion in 2030.⁸
- EPA estimates compliance costs of approximately US\$5.5 to 7.5 billion in 2020 and US\$7.3 to 8.8 billion in 2030.⁹

State’s Obligations Under the CPP

Despite several flexibilities for states in determining how to meet EPA-proposed targets, the CPP would impose binding emission levels on each of the states, as reflected in Table 1.

Table 1: Proposed State Rate-Based CO₂ Emission Performance Goals

State	Interim Goal*	Final Goal*	2012 Rate ¹⁰	Percent Decrease 2012-2030
AL	1,147	1,059	1,444	27%
AK	1,097	1,003	1,351	26%
AZ	735	702	1,453	52%
AR	968	910	1,640	45%

State	Interim Goal*	Final Goal*	2012 Rate ¹⁰	Percent Decrease 2012-2030
CA	556	537	698	23%
CO	1,159	1,108	1,714	35%
CT	597	540	765	29%
DE	913	841	1,234	32%

State	Interim Goal*	Final Goal*	2012 Rate ¹⁰	Percent Decrease 2012-2030
FL	794	740	1,200	38%
GA	891	834	1,500	44%
HI	1,378	1,306	1,540	15%
ID	244	228	339	33%
IL	1,366	1,271	1,895	33%
IN	1,607	1,531	1,923	20%
IA	1,341	1,301	1,552	16%
KS	1,578	1,499	1,940	23%
KY	1,844	1,763	2,158	18%
LA	948	883	1,466	40%
ME	393	378	437	14%
MD	1,347	1,187	1,870	37%
MA	655	576	925	38%
MI	1,227	1,161	1,696	32%
MN	911	873	1,470	41%
MS	732	692	1,130	39%
MO	1,621	1,544	1,963	21%
MT	1,882	1,771	2,245	21%
NE	1,596	1,479	2,009	26%
NV	697	647	988	34%
NH	546	486	905	46%
NJ	647	531	932	43%

State	Interim Goal*	Final Goal*	2012 Rate ¹⁰	Percent Decrease 2012-2030
NM	1,107	1,048	1,586	34%
NY	635	549	983	44%
NC	1,077	992	1,646	40%
ND	1,817	1,783	1,994	11%
OH	1,452	1,338	1,850	28%
OK	931	895	1,387	35%
OR	407	372	717	48%
PA	1,179	1,052	1,540	32%
RI	822	782	907	14%
SC	840	772	1,587	51%
SD	800	741	1,135	35%
TN	1,254	1,163	1,903	39%
TX	853	791	1,298	39%
UT	1,378	1,322	1,813	27%
VA	884	810	1,297	38%
WA	264	215	763	72%
WV	1,748	1,620	2,019	20%
WI	1,281	1,203	1,827	34%
WY	1,808	1,714	2,115	19%

*Expressed in pounds of CO₂ per net megawatt hour (lbs/net MWh)

State Plans

The CPP would require each state to submit an emission reduction plan to EPA for approval. Each plan must include “emission performance levels for its affected EGUs that are equivalent to the state-specific CO₂ goal in the emission guidelines, as well as the measures needed to achieve those levels and the overall goal.”¹¹ Those emission performance levels are based on four “building blocks” of state-specific, EPA-estimated CO₂ emission reductions, as discussed further below. States may choose whether to

express the proposed performance levels in the form of CO₂ emission rates or in a mass-based form in the state plan.¹²

States are not required to use measures from each building block. Instead, each state has the flexibility to select measures from the building block or combination of building blocks it prefers in order to achieve the state's emission reduction goal.¹³ States may also choose to include measures that were not part of the BSER determination so long as the state achieves reductions "at affected EGUs necessary to meet the goal EPA has defined as representing the BSER."¹⁴ Examples include market-based trading programs and construction of new Natural Gas Combined Cycle (NGCC) units and nuclear power plants.¹⁵

Plans must include a process for reporting on implementation, progress reporting, and corrective actions.¹⁶ Every two years beginning on January 1, 2022, states will be required to compare their emissions performance with the goals outlined in the plan.¹⁷

Criteria for Approval

EPA proposes evaluating state plans for approval based on the following criteria:

- Enforceable measures to reduce CO₂ emissions from EGUs
- Projected emission reduction performance equivalent to EPA-established goals and on an equivalent timeline
- Quantifiable and verifiable emission reductions
- A process for biennial reporting on plan implementation and progress towards achieving emissions goals¹⁸

Each state plan must also follow the EPA framework regulations at 40 C.F.R. § 60.23.¹⁹

Allowable Measures – the "Portfolio Approach"

Provided that state plans meet other key requirements, EPA will authorize plans that utilize a portfolio of actions and measures that achieve rate-based or mass-based emission performance level for affected EGUs, but that do not place legal responsibility for achieving the entire amount of the emission performance level on the affected EGUs.²⁰

Accounting for Early or Existing Actions

EPA is proposing that actions taken after the date of the CPP — or programs already in place, which result in CO₂ emission reductions at affected EGUs during the 2020-2030 period — would apply towards achieving the state's goal.²¹ EPA's proposal would not appear to allow early reduction credit for emission-reducing actions that take place before 2020, let alone actions that have taken place in recent years.

State Plan Timing

EPA expects to finalize the rulemaking by June 1, 2015.²² States must submit their plans to EPA by June 30, 2016.²³ States that cannot complete their plans by the deadline may participate in an optional two-phased plan submittal process, which consists of:

- A Letter of Intent to participate in the phased plan submittal process, due to EPA by April 1, 2016²⁴
- An Initial Plan, submitted by June 30, 2016, that contains specific components, including:
 - The reasons why the state needs more time to complete a plan
 - Commitments to "concrete steps" that will ensure that the state will submit a plan by June 30, 2017 (single state approach) or 2018 (multi-state approach)²⁵
- A final plan must be submitted either in 2017 or 2018, depending on the approach

EPA will review the plans and has proposed extending its review period from four months as provided in the EPA framework regulations to 12 months.²⁶

Multi-state Plans

EPA is proposing that states may choose to work with other states on multi-state plans that reflect the regional structure of electricity operating systems.²⁷ EPA proposes that states participating in a multi-state plan may submit a single plan on behalf of all participating states. EPA proposes an option that would allow extra time for a multi-state plan submission.²⁸ EPA notes that multi-state plans are likely to reduce compliance costs.²⁹ EPA is also seeking comment on a number of aspects of its proposal related to multi-state plans.

Key Questions and Answers Regarding the CPP Program

Program Design Question	CPP Proposal
Will EPA propose source-specific reference points (e.g., fuel-and-technology specific standards)?	The CPP proposes state emission performance goals rather than fuel-and-technology specific standards. ³⁰
What baseline will EPA use to establish the emission reduction goals?	EPA used 2012 emissions as a baseline in setting each state's performance goals. ³¹ BSER-based analysis considered 2013 as the base period for certain measures and 2017 as the base period for others. ³²
Will EPA express the targets as rate-based or mass-based goals?	EPA has calculated the goals as rate-based, carbon intensity benchmarks, but allows states to translate the rate-based goal into a mass-based equivalent. ³³
Will EPA set different rates of reduction in different states?	EPA has calculated a separate standard for each state in which there are affected EGUs. ³⁴
Will EPA place the compliance burden solely on the source?	EPA has offered states the option to adopt a "portfolio approach" of measures that states can implement that do not place legal responsibility for achieving the entire amount of emission performance level on affected EGUs. State plans could include measures enforceable against other entities (other affected entities with responsibilities assigned by the state or a state agency, authority or entity) ³⁵ that contribute to reductions in generation from the affected EGUs. Once the state plan is approved it would be federally enforceable against the "entity responsible for noncompliance." ³⁶ However, EPA also states that the measures, such as renewable energy and energy efficiency, could be enforceable against the affected EGU as well. ³⁷
Will EPA propose offsets, safety valves (alternative compliance option if costs of compliance far exceed expectations) or other cost containment mechanisms for source compliance?	EPA did not include safety valves or cost containment mechanisms in its proposal. However, EPA seeks comment on key stakeholder proposals, including the National Climate Coalition's proposal for a ceiling price alternate compliance payment that

	would fund state-directed clean technology investment. ³⁸ EPA did <u>not</u> propose that out-of-sector offsets could be used to demonstrate compliance. ³⁹
Will EPA identify a cost-effectiveness range or cost-effective boundaries?	While EPA has estimated the costs of compliance generally, EPA has not established a cost-effectiveness range or boundary. ⁴⁰
Will EPA provide for corporations to get credit for reductions across their portfolio? Will EPA determine how credit will be allocated between corporate portfolio credit and state plan credit?	EPA has not proposed a mechanism to allocate corporate portfolio credit.
Will EPA include a New Source Review (NSR) exemption or a streamlined NSR for any plant upgrades undertaken to reduce emissions in compliance with the CPP (to avoid criteria pollutant Best Available Control Technology (BACT)/Lowest Achievable Emission Rate (LAER) problems or offsets)?	EPA did not include an NSR exemption or streamlined NSR. EPA acknowledged the potential for sources to trigger NSR with upgrades to improve efficiency at the unit, but said that state plans could incorporate what is, in effect, a synthetic minor limit — conditions for a source anticipated to trigger NSR to limit that source’s dispatch in a way that would avoid significant net emissions increases and thus avoid triggering NSR. ⁴¹
Will EPA offer states a model rule or offer to create a federal trading platform to facilitate monetizing energy efficiency and renewable energy investments for CO ₂ reduction purposes? Does EPA recognize the opportunity to monetize technology outside of ratepayer programs?	While EPA encourages multi-state approaches and projects that this will be more cost effective than a single-state approach, EPA does not offer states a model rule, a federal trading platform or any other opportunity to monetize technology outside of ratepayer programs.

Relationship to Existing State Programs

How the CPP will interact with existing state programs adopted to reduce or control the emissions of greenhouse gases? For example, will the CPP apply to EGUs in addition to state programs, will states have to terminate their programs, or can state programs be deemed equivalent to avoid a duplication of standards?

Relevant state measures include cap-and-trade programs such as the Regional Greenhouse Gas Initiative (RGGI) that covers the power sector in nine Northeastern US states and California’s cap-and-trade program — which started operating in 2013 and covers more than 80 percent of California’s economy. There are also less comprehensive measures, such as performance-based standards (in California, Oregon and Washington), utility planning approaches (in Minnesota and Colorado), Renewable Portfolio Standards (RPS) (in more than 25 states), demand-side energy efficiency programs and energy efficiency resources standards (in 47 states).

The President directed EPA to build upon actions already underway in states. In the CPP, “EPA is proposing that existing state programs, requirements, and measures, may qualify for use in demonstrating that a state plan will achieve the required level of emission performance,” provided that the state program meets certain approvability criteria and contains the CPP-required components.⁴²

In evaluating EPA’s proposal, the following issues regarding state programs should be considered.

“Existing” State Programs

The Proposal would allow measures taken under an existing state program to count towards meeting CPP goals as long as (1) the program was in place as of the date EPA issued the Proposal, and (2) the measures taken under such program result in CO₂ emission reductions during the 2020-2030 period.⁴³ By existing, EPA refers to a state program, requirement or measure that is “on the books,” including legally binding requirements.

Conversion of a Rate-Based to a Mass-Based CO₂ Target

EPA also proposes that states can translate the rate-based goals set forth in the CPP into mass-based goals.⁴⁴ States require this flexibility if intending to meet the CPP through an existing cap-and-trade program that, by definition, relies on a mass-based target.

Assessing how existing state programs, especially cap-and-trade programs, will measure up against the proposed rate-based performance goal is difficult. A number of measures that typically would not affect the calculation of the carbon intensity of a state — such as demand-side management — are nevertheless included in EPA’s calculations. In other words, the CPP factors into a rate-based performance goal certain — but not all — adjustments that would be necessary to align the approach with a true cap as it exists under cap-and-trade programs. As the industry develops a greater understanding of the proposed approach, stakeholders will be interested to see whether and to what extent existing caps, such as the RGGI cap, are expected to be adjusted to comply with the CPP and whether this will impact market prices for allowances.

Multi-state Programs

The CPP provides an alternative for states; allowing emission targets to be met on a multi-state basis.⁴⁵ These multi-state programs require the submission of executed agreements among the states included in the program and a schedule setting forth implementation and design at the state level.⁴⁶ Based on an initial review, it appears that RGGI would be able to meet the requirements to qualify as a multi-state program under the CPP.

Start Date for Crediting EGUs’ Compliance with a State Program

EPA proposes that only actions taken after the release of the proposal or the promulgation of the CPP count toward meeting the state goals. EPA explains that this proposal is consistent with the “forward-looking” nature of the CPP.⁴⁷

EPA has identified and solicited comments, however, on alternative “start dates” for crediting EGU and state action. EPA has identified the following dates as alternatives to start considering state actions under existing programs: “the end date of the base period for the EPA’s BSER-based goals analysis (e.g., the beginning of 2013 for blocks 1-3 and beginning of 2017 for block 4, end-use energy efficiency), the end of 2005, or another date.”⁴⁸

Credits for Compliance with State Programs that Are More Stringent than EPA’s Performance Standards

As with most federal programs, the CPP sets the floor and states are permitted to adopt more stringent requirements. The CPP, however, does not explicitly address the situation where a specific state program is more stringent than the State Emission Performance Goals set by EPA. Moreover, many companies own or operate EGUs across a number of states, but EPA does not appear to have contemplated a framework that would explicitly permit such companies to earn credits in states where they over-comply

and use such credits for their operations in other states, even though this ability to carry over credits from one state to another could act as a useful cost containment mechanism.

California-Specific Considerations

EPA’s state target for California translates to a 23 percent reduction over 2012 emission levels by 2030. Although California is ahead of many states, since it has an existing cap-and-trade program, the required reduction is still significant.⁴⁹ Under the CPP, California would need to demonstrate its goal through a power-sector-only test, converting EPA’s rate-based goal to a mass-based equivalent. An economy-wide program, such as California’s, is more conducive to a carbon price equivalency test than to either a power-sector-only rate or mass test. Furthermore, California’s program has already resulted in significant emission reductions. Capturing “early action” value for California ratepayers and investors will require additional framework, which EPA has not proposed in the CPP.

EPA’s Basis for State Performance Goals

To determine the BSER for reducing CO₂ emissions at affected EGUs, EPA considered numerous measures that it determined are already being implemented and can be implemented more broadly to improve emission rates and to reduce overall CO₂ emissions from fossil fuel-fired EGUs.⁵⁰ The EPA-proposed BSER is based on a range of measures that fall into the following four main categories, or “building blocks.”

Table 2: BSER Building Blocks

		Best System of Emission Reduction	Cost per Ton
BSER BUILDING BLOCKS			
1	Reducing the carbon intensity at individual affected EGUs through heat rate improvements	6% improvement in average heat rate of coal-fired steam EGUs	US\$6-12 per metric ton. ⁵¹
2	Reducing emissions from the most carbon-intensive EGUs by substituting generation from less carbon-intensive affected EGUs	Replacing coal and oil/gas fired steam generation by increasing generation from existing NGCC capacity (including NGCC units under construction) to a 70% utilization rate	US\$30/ton
3	Reducing emissions from affected EGUs in the amount that results from substituting generation from expanded low- or zero-carbon generation	Completing all nuclear capacity under construction; avoiding retirement of 6% of existing nuclear capacity; increasing renewable capacity over time with state-level targets consistent with RPS established by states in the same region	Nuclear: US\$12-17/ton Renewables: US\$10-40/ton

		Best System of Emission Reduction	Cost per Ton
4	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	Increasing state demand-side energy efficiency to generate 1.5% annual electricity savings	US\$16-24/ton

EPA evaluated each building block individually against the BSER criteria and found that each independently merited consideration as part of the BSER.⁵² EPA also evaluated a combination of all four building blocks and a combination of building blocks 1 and 2 only.⁵³ EPA is soliciting comments on all aspects of its proposed BSER, as well as (1) fuel switching at individual EGUs;⁵⁴ (2) carbon capture and sequestration (CCS);⁵⁵ (3) new NGCC capacity;⁵⁶ and (4) heat rate improvements at units other than coal-fired steam generating units.⁵⁷

The CPP contemplates that states would not be required to use all of the building blocks or to apply any one of the building blocks to the same extent that EPA determines is achievable at reasonable cost. Instead, according to the CPP, each state would have the flexibility to select the measure or combination of measures it prefers in order to achieve its CO₂ emission reduction goal.⁵⁸ Thus, a state could choose to achieve more reductions from one building block and less from another, or it could choose to include measures that were not part of EPA's BSER determination, as long as the state achieves the CO₂ reductions at affected EGUs necessary to meet the goal EPA has defined as representing the BSER.⁵⁹

Building Block 1

Building Block 1 includes "inside the fence" measures that the source can take to reduce its CO₂ emission rates. EPA specifically evaluated generation efficiency improvements (heat rate improvements), CCS and substitution of lower carbon fuels in the existing boiler. EPA did not include CCS or co-firing/fuel switching as part of BSER for the purposes of establishing compliance levels. However, EPA indicates that these measures are available to states and sources as a compliance option.⁶⁰ EPA seeks comment on whether fuel substitution should be considered as part of BSER.⁶¹

Heat Rate Improvements

EPA finds that efficiency improvements of between 1.3-6.7 percent at coal-fired units could be achieved through the adoption of best practices, while an additional average reduction of four percent could be made through equipment improvements.⁶² EPA proposes a BSER reduction level of six percent, although EPA is also seeking comment on a less aggressive four percent reduction in the CO₂ emissions rate.⁶³ EPA's reduction target is based on EPA's analysis of heat rate variability, which EPA finds is a reliable indicator for performance. EPA determines that the coal-fired units with greater variability, if they were able to implement a portion of the improvements seen at units with lower variability, would be able to improve their heat rates.⁶⁴ EPA notes that the reduced costs of fuel for more efficient power plants could potentially cause a rebound effect, as the plants may be more economical to operate.⁶⁵ EPA estimates that the costs of heat rate upgrades will entirely or largely be offset by the reduction in fuel costs, but estimates that these improvements could be achieved by the nation's coal fleet — on average — for net costs in the range of US\$6-12 per metric ton.⁶⁶

Carbon Capture and Storage (CCS)

While EPA found in its proposal for new source fossil fuel-fire EGUs that partial CCS was adequately demonstrated and BSER for *new* fossil fuel-fired boilers and Integrated Gasification Combined Cycle (IGCC) units, EPA has not included CCS in its BSER for existing EGUs in the CPP (nor for modified or reconstructed sources in a separate proposal, discussed below). While noting that CCS could potentially reduce CO₂ emissions more than 90 percent (less in partial applications), EPA concluded that the cost of retrofitting aging facilities would be substantial and could affect the cost and supply of energy nationwide.⁶⁷

Fuel Switching

EPA also discusses the potential for reducing fossil fuel emissions through switching the fuel combusted in the boiler to a fuel that emits fewer greenhouse gases, such as natural gas or biomass.⁶⁸ EPA notes that several coal-fired power plants have switched to natural gas, although EPA acknowledges the potential price limitations to that strategy going forward. EPA also mentions the possibility of cofiring with biomass as a potential emission reduction tool, although the proposal notes that EPA is in the process of revising its accounting method for the greenhouse gas emissions from biomass.⁶⁹ Primarily due to the relatively high price of natural gas compared to coal, EPA determined that natural gas conversion should not be considered as part of BSER. EPA is requesting comment on the proposals.

System-Wide Emission Reductions

Building Blocks 2, 3, and 4 represent system-wide approaches that states can pursue to achieve EGU emission reductions indirectly. Building Block 2 relies on re-dispatch from affected steam EGUs to affected NGCC units. Building Block 3 is based on expanded use of renewable and nuclear generation. Building Block 4 is based on expanded use of demand-side energy efficiency measures. Collectively, these three building blocks represent “outside the fence” reductions because their implementation depends on system-wide measures beyond the fenceline of an individual EGU.

Building Block 2

Building Block 2 of the BSER relies on reductions in emissions of CO₂ from EGUs through “re-dispatch;” substituting electricity generation output from the most carbon-intensive affected EGUs, such as coal-fired and oil/gas-fired steam units, with generation output from less carbon-intensive affected EGUs, such as NGCC units.⁷⁰ NGCC units generally have lower heat rates and lower CO₂ emissions than coal-fired and oil/gas-fired steam units. EPA indicates that most NGCC units could be operated to generate more electricity, or re-dispatched in order to replace some of the electricity generated by coal-fired and oil/gas-fired steam units.⁷¹

EPA states that while the average reported availability of NGCC units generally exceeds 85 percent, the average NGCC capacity rate utilization in the United States was only 46 percent in 2012.⁷² As part of the BSER, EPA proposes that states increase the average annual NGCC unit utilization rate to a target rate of 70 percent.⁷³ According to EPA, combined CO₂ emissions from coal-fired and oil/gas-fired steam units and NGCCs would have been reduced by 13 percent if the target NGCC unit utilization rate of 70 percents had been achieved in 2012.⁷⁴

Role of RTOs and ISOs

The CPP indicates that substituting increased output from NGCC units for output from coal-fired and oil/gas-fired steam units could potentially reduce CO₂ emissions significantly.⁷⁵ However, EPA provides states with little guidance as to how to implement this building block other than to point out that there are “significant efficiencies”⁷⁶ that can result from coordination among multiple states. EPA suggests that

states consult with their regional transmission organizations (RTOs) and independent system operators (ISOs).⁷⁷ EPA notes that RTOs and ISOs already dispatch EGUs based on a variety of factors, including bid prices calculated in part using the EGU's variable costs. Further, certain RTOs and ISOs with EGUs subject to either the RGGI or California's cap-and-trade program under AB32 have established mechanisms that incorporate the costs of greenhouse gas allowances as part of the variable costs for applicable EGUs.⁷⁸ However, not all states are within the footprints of an RTO or ISO.⁷⁹ For those states located outside of the footprint of an RTO or ISO, EPA suggests that they consult with regional groups and system operators to help implement the re-dispatch building block (as well as the other building blocks).⁸⁰

Generally speaking, RTOs and ISOs dispatch EGUs in order of least cost, based on the EGU's bids or estimated variable costs. In some instances, these bids and estimated short-run marginal costs may incorporate environmental compliance costs. For example, EGUs interconnected to the California Independent System Operator Corporation (CAISO) and subject to CAISO's open access transmission tariff may incorporate the emissions costs of greenhouse gas allowances in calculating their variable costs.⁸¹ Under the CAISO tariff, natural gas-fired EGUs subject to AB32 use a greenhouse gas allowance cost adder that contains three components: (1) the EGU's heat rate or fuel requirements; (2) the greenhouse gas emissions rate authorized by the California Air Resources Board (ARB); and (3) the applicable greenhouse gas allowance price, which is calculated using a greenhouse gas price index based on at least two prices from two or more publications. For all other fossil fuel-fired EGUs subject to AB32, the entities that bid these EGUs into CAISO's energy markets must provide CAISO with greenhouse gas compliance costs consistent with the information they provide to the ARB.⁸² Other RTOs and ISOs, such as PJM, ISO-New England, Inc. (ISO-NE) and the New York Independent System Operator, Inc. (NYISO) use similar measures that incorporate the cost of greenhouse gas allowances incurred by fossil fuel-fired EGUs subject to RGGI.⁸³

The CPP also references a set of recommendations from the ISO/RTO Council, whose members include all seven of the RTOs and ISOs in the US.⁸⁴ The ISO/RTO Council made two proposals: (1) a "Reliability Safety Valve" to assess and mitigate system reliability impacts; and (2) a "Regional Compliance Measurement" that would allow states to adopt a regional measurement mechanism in their State Plans to comply with required CO₂ emission reductions.⁸⁵ While the CPP does not expressly endorse these proposals, it appears to accommodate the latter but remains silent as to the former.

The ISO/RTO Council proposals are not the only ones that would rely on RTOs and ISOs to assist in implementing the CPP. Among others, the Brattle Group also prepared a discussion paper for Great River Energy that calls for a market-based regional approach to implementing the regulation of greenhouse gas emissions from EGUs.⁸⁶

Building Block 3

Building Block 3 of the BSER relies on reducing emissions through the substitution of power from more carbon-intensive affected EGUs with power from low-and-zero-carbon generation.⁸⁷ In particular, EPA includes the increased use of renewable energy and continued use of nuclear power in the BSER.⁸⁸

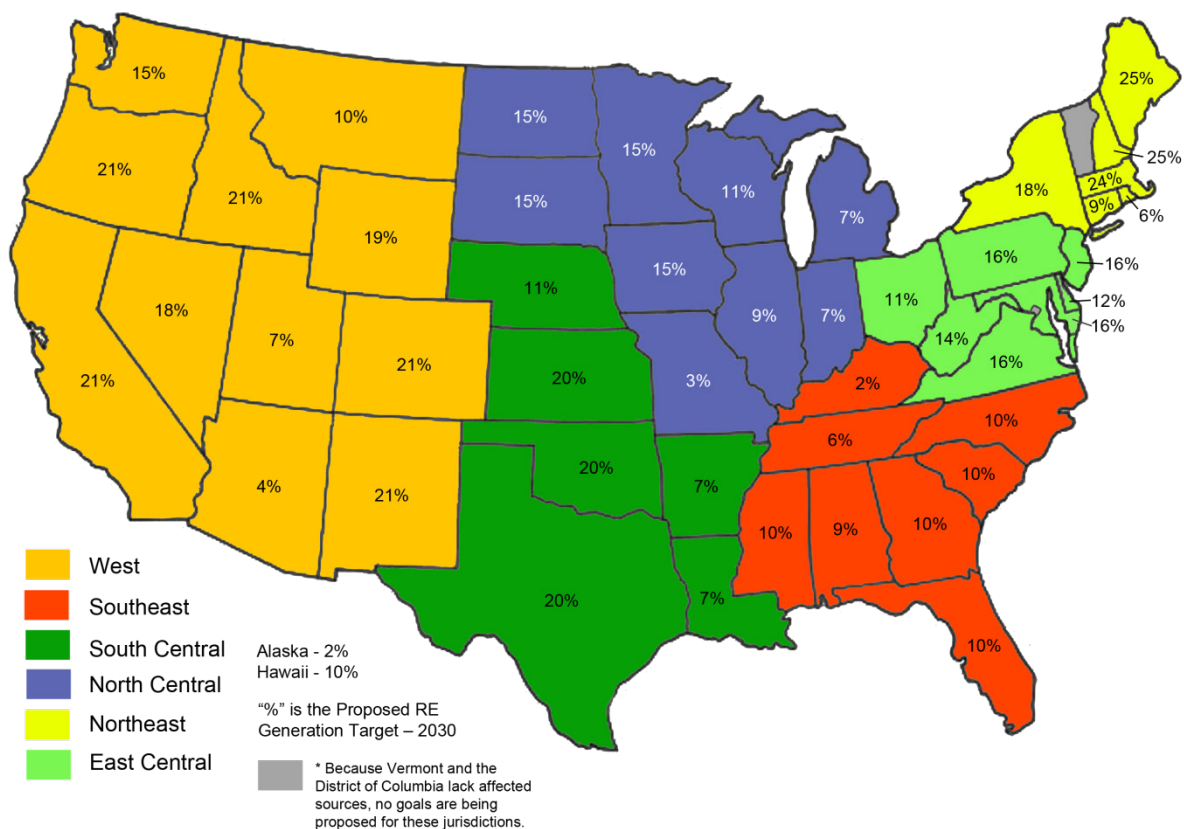
Expanding Renewable Energy Generation

For renewable energy, the CPP establishes a "best practices scenario" that EPA believes constitutes a reasonable and cost-effective objective for renewable energy generation.⁸⁹ In formulating the proposal, the CPP relies heavily on existing state Renewable Portfolio Standards (RPS) which a majority of states have already established. The CPP does not propose establishing any new RPS requirements. Instead, the CPP evaluates a level of renewable resource development for individual states — recognizing

regional differences — that EPA views as reasonable and consistent with policies that states have already adopted, based on their own policy objectives and assessments of feasibility and cost.⁹⁰

For each state, EPA proposes a target level of renewable energy generation for 2030 and beyond, based on existing RPS requirements of other states in the same region.⁹¹ The CPP defines six distinct regions for this purpose based on geographic proximity and the existing structure of the wholesale electricity system, as represented by the North American Electric Reliability Corporation (NERC) and existing RTOs. Based on regional RPSs, the CPP includes a goal calculated for each state, representing a target total percentage of generation from renewable sources for the state. The geographic regions, as well as the targets for each state, are depicted in Figure 1, below.⁹²

Figure 1: Renewable Energy Generation Targets for 2030 by State



EPA proposes to credit existing renewable energy development. The renewable generation levels in the CPP represent total amounts of renewable generation rather than the incremental amount above a particular baseline. As a result, the necessary renewable generation levels can be met from any renewable capacity, regardless of when the capacity was installed.⁹³

EPA indicates that the cost to reduce emissions through renewable energy development ranges from US\$10-40 per metric ton of CO₂.⁹⁴ EPA points to evidence that existing RPS programs have caused only very minor cost increases to electricity prices.⁹⁵

New and Preserved Nuclear Capacity

EPA acknowledges that little nuclear capacity has been constructed in the US in recent years.⁹⁶ However, EPA notes that five nuclear EGUs at three plants are currently under construction. EPA is proposing that the emission reductions achievable from the five nuclear units currently under construction should be credited towards the state goals.⁹⁷

The CPP notes that states can reduce carbon output by delaying nuclear plant retirement. The CPP assumes that, absent regulation under Section 111(d), approximately six percent of current nuclear capacity would be at risk of retirement, representing 200 to 300 million metric tons of CO₂ emissions over a 10-year period.⁹⁸ The CPP factors the preservation of this capacity into BSER.⁹⁹

Building Block 4

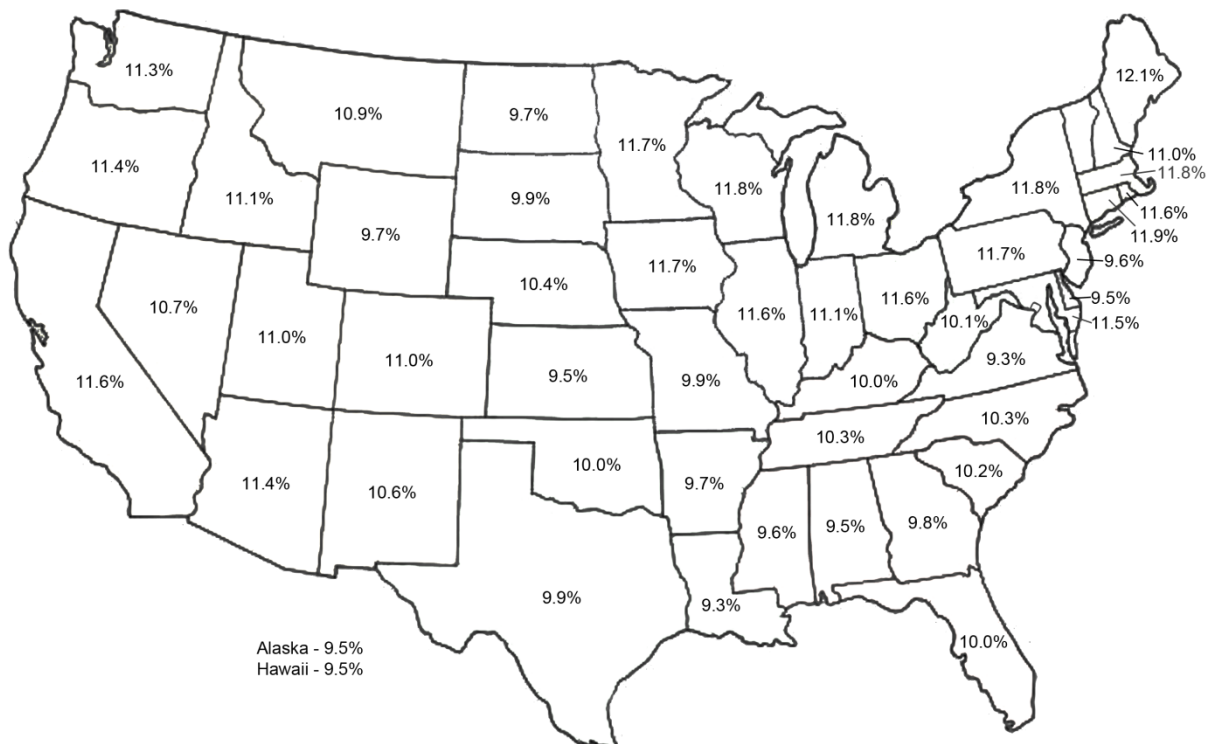
The CPP Building Block 4 relies on indirect cuts in EGU emissions by reducing the demand for electricity through implementing energy efficiency measures.¹⁰⁰ The CPP indicates that every state has adopted energy efficiency measures and that these measures are a proven basis for reducing CO₂ emissions at affected EGUs.¹⁰¹ EPA notes that because fossil fuel-fired EGUs typically have higher variable costs than other EGUs (such as nuclear and renewable EGUs), fossil fuel-fired generation is typically the first to be replaced when demand is reduced.¹⁰²

As with Building Block 3, EPA calculates the scenario based on the performance of existing programs.¹⁰³ EPA notes that 12 states have either achieved — or have established requirements that will lead them to achieve — annual incremental savings rates of at least 1.5 percent of the electricity demand that would otherwise have occurred. Under the CPP, each state's annual incremental savings rate increases from its 2012 annual saving rate to a rate of 1.5 percent over a period of years starting in 2017.¹⁰⁴ The CPP estimates states will increase their savings rate level at a pace of 0.2 percent per year.¹⁰⁵ For states already at or above the 1.5 percent annual incremental savings rate (based on 2012 reported data), EPA estimates that the states would realize a 1.5 percent rate in 2017 and maintain that rate through 2029.¹⁰⁶

The savings from energy efficiency programs are cumulative. So, for example, a state in which a sustained program is implemented with a 1.5 percent annual incremental savings rate could expect cumulative annual savings of approximately 1.5 percent after the first year, 3.0 percent after the second year, 4.5 percent after the third year, and so on.¹⁰⁷

The CPP's cumulative annual savings targets for 2020-2029 are included for each state, below, in Figure 2.¹⁰⁸

Figure 2: Cumulative Energy Efficiency Savings Targets for 2030 as a Percentage of Annual Sales



Combination of Four Building Blocks Constitutes BSER

Although EPA notes that all four building blocks can individually reduce EGU CO₂ emissions, EPA concludes that the combination of all four building blocks can achieve greater overall CO₂ emission reductions from affected EGUs, at lower cost per unit of CO₂, and therefore constitutes BSER.¹⁰⁹

EPA justifies “outside the fence” building blocks in the BSER primarily on the grounds that (1) the building blocks include technically feasible measures such as RPSs and market-based greenhouse gas emission programs and demand-side energy efficiency programs that are widely used by utilities and states, and (2) the measures are capable of reducing emissions at a reasonable cost. EPA also relies on the highly integrated nature of the electricity system, “where electricity is fungible and the demand for electricity services can be met in many ways (including through demand-side energy efficiency)” to support relying on a combined approach that applies system-wide measures instead of focusing solely on measures at individual EGUs.¹¹⁰

EPA’s Modified and Reconstructed Source Proposal

In a separate but related rulemaking also announced on June 2, 2014, EPA proposed emission limits under CAA Section 111(b) for CO₂ emitted from modified and reconstructed fossil fuel-fired EGUs.¹¹¹ This proposal is significant in and of itself, but also with respect to the existing source proposal, since some of the equipment upgrades that EPA has proposed for Building Block 1 could make a unit a modified source. A modified source is an existing source that undergoes a physical or operational change that increases

the amount of an air pollutant emitted by the source, or which results in the emission of an air pollutant not previously emitted. A reconstructed source is an existing source that replaces components at a capital cost exceeding 50 percent of the fixed capital costs of an entirely new facility, and for which compliance with NSPS is technologically and economically feasible.

Rather than prescribe specific technologies, the proposed Modified and Reconstructed Source Proposal sets numeric emission limits for CO₂ emissions based on the BSER.

Modified Sources

The rulemaking would require modified utility boilers and IGCC units to satisfy one of two co-proposed alternative standards. In the first alternative, modified sources would be required to meet a unit-specific numeric emission standard that is two % lower than the unit's best demonstrated annual performance during the years from 2002 to the year the modification occurs.¹¹² In the second alternative, modified sources would be required to meet a unit-specific numeric emission standard that would be dependent on the timing of the modification relative to the adoption of a Section 111(d) plan that covers the source. Existing sources that undertake a modification prior to becoming subject to an approved Section 111(d) state plan would be required to meet a unit-specific numerical emission standard based on the source's best demonstrated historical performance and calculated the same as under the first alternative (i.e., two percent lower than the unit's best demonstrated annual performance during the years from 2002 to the year the modification occurs).¹¹³ EPA has determined that this standard can be met through a combination of best operating practices and equipment upgrades.¹¹⁴ By contrast, existing utility boilers and IGCC units that undertake modifications after becoming subject to the requirements of an approved Section 111(d) state plan would be required to meet unit-specific emission limits established by a third-party assessment of opportunities for energy efficiency improvements at the affected source.¹¹⁵

Modified natural gas-fired stationary combustion turbines not subject to a Section 111(d) plan at the time of modification would be required to meet proposed performance standards based on NGCC technology as the BSER.¹¹⁶ Stationary combustion turbines that are subject to an approved Section 111(d) plan must remain in the plan while meeting the same proposed performance standards based on NGCC technology as the BSER.

The proposed emission limits for modified sources, applicable on a 12-month rolling average basis, are outlined in the table below.

Proposed Emission Limits – Modifications¹¹⁷

Timing	Subcategory	Emission Limit
Not Subject to State CAA 111(d) Plan at Time of Modification	Modified Utility Boilers and IGCC Units (heat input rating > 2,000 MMBtu/h)	2% less than unit's best demonstrated annual performance since 2002; EMISSIONS LIMIT TO BE NO MORE STRINGENT THAN 1,900 lb CO ₂ /MWh-net
	Modified Utility Boilers and IGCC Units (heat input rating <= 2,000 MMBtu/h)	2% less than unit's best demonstrated annual performance since 2002; EMISSIONS LIMIT TO BE NO MORE

		STRINGENT THAN 2,100 lb CO ₂ /MWh-net	
	Modified Natural Gas-Fired Stationary Combustion Turbines (heat input rating > 850 MMBtu/h)	1,000 lb CO ₂ /MWh-gross	
	Modified Natural Gas-Fired Stationary Combustion Turbines (heat input rating <= 850 MMBtu/h)	1,100 lb CO ₂ /MWh-gross	
Modification After Becoming Subject to State CAA 111(d) Plan	Modified Utility Boilers and IGCC Units	<u>Alternative 1</u> 2% less than unit's best demonstrated annual performance since 2002; EMISSIONS LIMIT TO BE NO MORE STRINGENT THAN 1,900 lb CO ₂ /MWh-net (for units with a heat input rating > 2,000 MMBtu/h) and 2,100 lb CO ₂ /MWh-net (for units with a heat input rating <= 2,000 MMBtu/h)	<u>Alternative 2</u> Unit-specific emission limit determined by the expected performance after implementation of identified energy efficiency improvement opportunities AND 111(d) requirements
		Modified Natural Gas-Fired Stationary Combustion Turbines (heat input rating > 850 MMBtu/h)	1,000 lb CO ₂ /MWh-gross AND 111(d) requirements
		Modified Natural Gas-Fired Stationary Combustion Turbines (heat input rating <= 850 MMBtu/h)	1,100 lb CO ₂ /MWh-gross AND 111(d) requirements

Reconstructed Sources

The proposal sets performance standards for reconstructed utility boilers and IGCC units based on the current best-performing (i.e., most efficient) generating technology at the affected source as BSER. It also proposes performance standards for reconstructed natural gas-fired stationary combustion turbines based on NGCC technology as the BSER. The emission limits outlined in the table below (applicable on a

12-month rolling average basis) do not change based on the existence of an approved Section 111(d) state plan.

Proposed Emission Limits – Reconstructions¹¹⁸

Subcategory	Emission Limit
Reconstructed Utility Boilers and IGCC Units (heat input rating > 2,000 MMBtu/h)	1,900 lb CO ₂ /MWh-net
Reconstructed Utility Boilers and IGCC Units (heat input rating <= 2,000 MMBtu/h)	2,100 lb CO ₂ /MWh-net
Reconstructed Natural Gas-Fired Stationary Combustion Turbines (heat input rating > 850 MMBtu/h)	1,000 lb CO ₂ /MWh-gross
Reconstructed Natural Gas-Fired Stationary Combustion Turbines (heat input rating <= 850 MMBtu/h)	1,100 lb CO ₂ /MWh-gross

Units triggering both the modification and reconstruction provisions of EPA’s proposal would be subject to the reconstructed source standards. Additionally, EPA has asserted that all existing sources subject to requirements under an approved Section 111(d) plan at the time of the modification or reconstruction would remain subject to those requirements after modification or reconstruction.¹¹⁹ Stated differently, all existing sources that become modified or reconstructed sources, and which are subject to a Section 111(d) plan at the time of the modification or reconstruction, will remain subject to any applicable regulatory requirements in that state plan in addition to being subject to the regulatory requirements proposed under Section 111(b).¹²⁰ EPA believes this approach necessary to ensure the integrity of Section 111(d) state plans, and to avoid creating incentives for sources to circumvent their obligations under Section 111(d) by undertaking modifications or reconstructions.¹²¹ EPA has specifically invited comment on this approach, including whether the statutory text supports the approach and whether the approach is a sensible policy that will further the CAA’s goals.¹²²

“Unfinished Business” and the National Climate Coalition Proposal

As noted above, EPA will need to tackle a number of important design considerations and program implementation challenges before finalizing the CPP. EPA’s guidance on these considerations will be critical to enable the states to carry out state plans to achieve the ambitious targets EPA proposes to impose on them:

- **Credit Allocation:** EPA bases the CPP on a number of measures outside of the “fenceline” of the source, such as energy efficiency measures and increased renewable energy generation. However, a number of questions regarding how credit for those reductions will be allocated in state plans in practice remain unanswered. States and companies need additional guidance on how reductions implemented in a state that lead to reductions in another state should be treated in single-state plans. As many companies own or operate EGUs across a number of states, EPA should design a framework that would explicitly permit such companies to earn credits in states where they over-

comply and use such credits for their operations in other states. Alternatively, EPA should provide an option for states to allow companies to earn credits and sell them to EGUs located in other states.

- **Model Rule and Regional and Multi-State Trading Platform:** EPA should develop and propose for the states a model rule and regional or multi-state trading platform, which states could opt to join.
- **Cost-effectiveness Benchmark:** EPA should identify a cost-effectiveness benchmark, against which compliance options can be compared.
- **Alternative Compliance Payment or Safety Valve:** EPA should propose an alternative compliance payment option to fund state-directed energy-efficiency and low-carbon energy (*i.e.*, cleantech) investments and serve as a safety valve if compliance costs are higher than anticipated.

The National Climate Coalition (NCC), a Latham-facilitated, multi-industry coalition, has developed a proposal to balance meaningful carbon emission reductions with other national priorities, such as economic strength, electricity reliability and energy independence. The NCC proposal addresses each of these important design components. In fact, the CPP outlines and seeks comment on several of the NCC's recommendations, including the development of a model rule for interstate trading, the alternative compliance payment option and different options for determining state plan equivalency.¹²³ The NCC will continue its outreach to EPA and the states to facilitate consideration of these important program design issues.

Legal Risk

The CPP's scope and impact is unprecedented. How broadly courts will view EPA's authority is yet to be determined. Latham & Watkins LLP is not at this time expressing any view as to the likelihood that the CPP might be determined upon judicial review to be legally deficient on any ground. We note that, over the last forty years, EPA has used 111(d) to regulate only four pollutants from five source categories,¹²⁴ and no federal court has reviewed, in any meaningful way, EPA's interpretation of its Section 111(d) authority.¹²⁵ We have given careful consideration to legal risk-related issues but do not express any conclusions in this document.

Beyond the Fence Line / Energy System Regulation

Including "outside the fence" building blocks in the BSER and the regulation of state energy programs are novel uses of EPA's authority under Section 111(d). On its own terms, Section 111 applies to "stationary sources" of an air pollutant, but the "outside the fence," energy system emission reductions would be beyond the control of the source. As a practical matter, how the states would implement the "outside the fence" building blocks in their state plans remains unclear. This approach raises a range of legal issues not addressed here.

Portfolio Approach

In addition to compliance requirements for EGUs themselves, the CPP would purport to give the states the authority to impose legal responsibility on entities other than affected EGUs. The CPP refers to this as the "portfolio approach" and specifically refers to Building Block 3 and 4 measures in this context.¹²⁶ EPA contemplates that enforcing such measures would potentially involve directly regulating local distribution companies, vertically integrated investor-owned utilities, non-profit organizations or state agencies themselves.¹²⁷ In some cases, EPA recommends that adequate enforcement may require independent state legislation.¹²⁸ Regardless of how the states manage to exercise such authority, potentially regulating entities that are not stationary sources or do not emit CO₂ could raise novel legal issues given Section 111(d)'s mandate for EPA to establish "standards for emissions of air pollutants" for "stationary sources."

Opportunities to Engage and Comment

EPA has stated this comment period offers the only opportunity for interested parties to comment on EPA's proposed methodology for computing state goals based on application of BSER. In addition to comments on the overall framework of the proposal, interested parties should use this public comment period to carefully review EPA's data and assumptions and comment on any data errors or adjustments that must be made to the state-specific data.

EPA is requiring that interested parties submit comments on the rule on or before 120 days after the date of publication in the Federal Register. Proposal publication in the Federal Register often takes a month or longer. EPA's proposed new source performance standards for new power plants released on September 20, 2013, was not published in the Federal Register until January 08, 2014. Those interested in commenting on the Modified and Reconstructed Source Proposal should note this proposal is distinct from the CPP, and comments on that separate proposal must be submitted in a separate rulemaking docket (EPA-HQ-OAR-2013-0603). Further, even if an entity submitted pertinent comments on modified sources in response to EPA's 2012 request, the entity must resubmit the comments for consideration under this rulemaking.

EPA will hold a series of hearings on July 29, 2014 (in Atlanta, Georgia and Denver, Colorado), July 31, 2013 (in Pittsburgh, Pennsylvania) and in Washington, D.C. during the week of July 28, 2014. EPA has encouraged those wishing to speak at the hearings to register in advance.

You Might Also Be Interested In

June 5, 2014 Webcast: [EPA's GHG Rule: Overview and Implications](#)

Client Alert: [EPA Proposes New Greenhouse Gas Performance Standards for New Power Plants](#)

Client Alert: [President Obama Directs EPA to Regulate Carbon Emissions Under Clean Air Act](#)

If you have questions about this *Client Alert*, please contact one of the authors listed below or the Latham lawyer with whom you normally consult:

[Robert A. Wyman](#)

robert.wyman@lw.com
+1.213.891.8346
Los Angeles

[Claudia M. O'Brien](#)

claudia.o'brien@lw.com
+1.202.637.2181
Washington, D.C.

[Jean-Philippe Brisson](#)

jp.brisson@lw.com
+1.212.906.1316
New York

[Michael J. Gergen](#)

michael.gergen@lw.com
+1.202.637.2188
Washington, D.C.

[Julia A. Hatcher](#)

julia.hatcher@lw.com
+1.202.637.2238
Washington, D.C.

[Christopher H. Norton](#)

chris.norton@lw.com
+1.714.755.8084
Orange County

[Ann Claassen](#)

ann.claassen@lw.com
+1.202.637.2200
Washington, D.C.

[Marc T. Campopiano](#)

marc.campopiano@lw.com
+1.714.755.2204
Orange County

[Aron Potash](#)

aron.potash@lw.com
+1.213.891.8758
Los Angeles

[Stacey L. VanBelleghem](#)

stacey.vanbelleghem@lw.com
+1.202.637.2153
Washington, D.C.

[Eli W.L. Hopson](#)

eli.hopson@lw.com
+1.202.637.3304
Washington, D.C.

[Joshua W. Marnitz](#)

joshua.marnitz@lw.com
+1.202.637.3314
Washington, D.C.

[David E. Pettit](#)

david.pettit@lw.com
+1.202.637.3341
Washington, D.C.

[Michael H. Dreibelbis](#)

michael.dreibelbis@lw.com
+1.202.906.1257
New York

[Douglas M. Bushey](#)

douglas.bushey@lw.com
+1.202.637.2366
Washington, D.C.

[Laura J. Glickman](#)

laura.glickman@lw.com
+1.202.637.2328
Washington, D.C.

[Helen H. Lee*](#)

helen.lee@lw.com
+1.202.637.1017
Washington, D.C.

[R. Andrew Westgate](#)

andrew.westgate@lw.com
+1.212.906.2919
New York

*Licensed to practice in California only; all work supervised by a member of the DC Bar.

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Endnotes

- ¹ EPA, "Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units" (June 2, 2014) (pre-publication version) [EPA-HQ-OAR-2013-0602] available at <http://www2.epa.gov/sites/production/files/2014-05/documents/20140602proposal-cleanpowerplan.pdf> (hereinafter Proposal).
- ² 42 U.S.C. § 7411(d). EPA has already proposed new source performance standards for greenhouse gas emissions from new fossil fuel-fired electric generating units. See EPA, "Standards of Performance for Greenhouse Gas Emissions From New Stationary Sources: Electric Utility Generating Units" 79 Fed. Reg. 1430 (Jan. 8, 2014); see also Latham & Watkins Client Alert Commentary, "[EPA Proposes New Greenhouse Gas Performance Standards for New Power Plants](#)" (Sept. 27, 2013).
- ³ See 42 U.S.C. § 7411(a),(d).
- ⁴ Proposal at 49.
- ⁵ *Id.*; *id.* at 623 (to be codified at 60.5775(d)).
- ⁶ *Id.* at 129.
- ⁷ *Id.* at 133-34.
- ⁸ *Id.* at 53-54.
- ⁹ *Id.* at 55-58.
- ¹⁰ This data from EPA includes existing fossil, non-hydro renewable and approximately six percent of nuclear generation.
- ¹¹ Proposal at 43.
- ¹² *Id.* at 43.
- ¹³ *Id.* at 27.
- ¹⁴ *Id.*
- ¹⁵ *Id.* at 39.
- ¹⁶ *Id.*
- ¹⁷ *Id.*
- ¹⁸ *Id.* at 46, 425-33.
- ¹⁹ *Id.* at 46.
- ²⁰ *Id.* at 45.
- ²¹ *Id.* at 333.
- ²² *Id.* at 47.
- ²³ *Id.*
- ²⁴ *Id.* at 115.
- ²⁵ *Id.* at 47-48.
- ²⁶ *Id.* at 49.
- ²⁷ *Id.* at 23.
- ²⁸ *Id.* at 48.
- ²⁹ *Id.* at 52-54.
- ³⁰ *Id.* at 332, 339.
- ³¹ *Id.* at 350.

32 *Id.* at 476.

33 *Id.* at 340.

34 *Id.* at 332, 346. EPA has not calculated goals for Vermont and the District of Columbia, which EPA states do not have affected EGUs.

35 *Id.* at 471-72.

36 *Id.* at 75, 381-83.

37 *Id.* at 385-86.

38 *Id.* at 94.

39 *Id.* at 429.

40 *Id.* at 55-58.

41 *Id.* at 531.

42 *Id.* at 474-475.

43 *Id.* at 474.

44 *Id.* at 359.

45 *Id.* at 360.

46 *Id.* at 463.

47 *Id.* at 479-80.

48 *Id.* at 478.

49 California's Global Warming Solutions Act of 2006 (known as AB32) requires the state to reduce annual GHG emissions to 1990 levels by 2020. Cal. Health & Safety Code § 38550 (Deering 2014). Accordingly, California has established the 2020 statewide cap as 427 million metric tons of carbon dioxide equivalent. State of California, California Air Resources Board, Resolution 07-55 (Dec. 6, 2007); *see also* State of California, California Air Resources Board, Climate Change Scoping Plan, at ES-1 (Dec. 2008), *available at* http://www.arb.ca.gov/cc/scopingplan/document/adopted_scoping_plan.pdf; State of California, California Air Resources Board, First Update to the Climate Change Scoping Plan, at 1 (May 2014), *available at* http://www.arb.ca.gov/cc/scopingplan/2013_update/first_update_climate_change_scoping_plan.pdf.

50 *Id.* at 26.

51 *Id.* at 143.

52 *Id.* at 34.

53 *Id.*

54 *Id.* at 238-42.

55 *Id.* at 242-44.

56 *Id.* at 244-48.

57 *Id.* at 248-49.

58 *Id.* at 27.

59 *Id.*

60 *Id.* at 143-146.

61 *Id.* at 146.

62 *Id.* at 142-43.

63 *Id.* at 166-167.

64 *Id.* at 162-63.

65 *Id.* at 157.

66 *Id.* at 143.

67 *Id.* at 144.

68 *Id.* at 238.

69 *Id.* at 508-511.

70 *Id.* at 33-34, 153, 250.

71 *Id.* at 146-150, 171-195, 276-281.

72 *Id.* at 148.

73 *Id.* at 114.

74 *Id.* at 149-150.

- ⁷⁵ See *id.* at 171-174.
- ⁷⁶ *Id.* at 430. EPA also estimates that the average cost of CO₂ reductions achieved over the 2020-2029 period would be US\$30 per metric ton of CO₂ emissions abated if states meet the 70 percent utilization rate for NGCC units and re-dispatch occurred across state lines. EPA estimates that this cost would increase to US\$33 per metric ton of CO₂ emissions abated if re-dispatch was limited by state boundaries. *Id.* at 189, 191.
- ⁷⁷ *Id.* at 310-311, 370-371.
- ⁷⁸ *Id.* at 147, 150. The CPP specifically notes that the Market Monitoring Unit for PJM Interconnection, L.L.C. (PJM) publishes a CO₂ emission allowance cost component used to estimate the variable costs of EGUs that are located in the RGGI states. See *id.* at n.124.
- ⁷⁹ 38 states and the District of Columbia are located at least in part in the footprint of an RTO or ISO. RTOs and ISOs cover two-thirds of the geographic footprint of the US and serve 75 percent of the national demand for electricity. ISO/RTO Council, EPA CO₂ Rule – ISO/RTO Council Reliability Safety Valve and Regional Compliance Measurement and Proposals at 5, *available at* http://www.isorto.org/Documents/Report/20140128_IRCProposal-ReliabilitySafetyValve-RegionalComplianceMeasurement_EPA-C02Rule.pdf (ISO/RTO Council Proposal).
- ⁸⁰ Proposal at 310-311.
- ⁸¹ See CAISO Open Access Transmission Tariff, Sections 6.5.2.3.4, 30.4.1.1, 30.4.2, 30.7.3.4, 39.6.1.6, 39.7.1.1, 40.6.8; see also *California Independent System Operator Corporation*, 141 FERC ¶ 61,237 (2012) (accepting tariff revisions to incorporate greenhouse gas compliance costs associated with California’s cap-and-trade program under AB32) (*CAISO*).
- ⁸² CAISO found that a “one-size fits all” approach for fossil fuel-fired EGUs was not practical because of the small number of non-natural gas-fired EGUs and variety of fuel types among this set of EGUs. *CAISO* at P 9.
- ⁸³ PJM, ISO-NE, and the NYISO all provide transmission service to EGUs that are subject to RGGI and incorporate costs of CO₂ allowances. See PJM Manual 15: Cost Development Guidelines; ISO-NE Open Access Transmission Tariff, Market Rule 1, Appendix A; NYISO Market Administration and Control Area Services Tariff (MST), Attachment H.
- ⁸⁴ Proposal at 310.
- ⁸⁵ ISO/RTO Council Proposal at 1. Members of the ISO/RTO Council include CAISO, Electric Reliability Council of Texas, Inc. (ERCOT), ISO-NE, Midcontinent Independent System Operator, Inc., (MISO), NYISO, PJM and Southwest Power Pool, Inc. (SPP), as well as the Alberta Electric System Operator (AESO) and the Independent Electricity System Operator of Ontario, Inc., (IESO).
- ⁸⁶ The Brattle Group, A Market-Based Regional Approach to Implementing EPA’s GHG Emissions Regulation (Apr. 2014), *available at* http://www.brattle.com/system/news/pdfs/000/000/616/original/A_Market-based_Regional_Approach_to_Valuing_and_Reducing_GHG_Emissions_from_Power_Sector.pdf?1397501081. For another alternative proposal, see Clean Air Task Force, *Power Switch: An Effective, Affordable Approach to Reducing Carbon Pollution from Existing Fossil-fueled Power Plants* (Feb. 2014), *available at* http://www.cاتف.us/resources/publications/files/Power_Switch.pdf.
- ⁸⁷ Proposal at 250.
- ⁸⁸ *Id.* at 195.
- ⁸⁹ *Id.* at 196. The CPP defines RE to include certain types of generation capacity. Hydropower, for example, is excluded for the purposes of quantifying BSER. *Id.* at 200. EPA has invited comment on this decision and notes that states can still consider *incremental* hydropower (expanding generating at an existing facility or adding a new facility) as an option for compliance with state goals. *Id.* at 207.
- ⁹⁰ *Id.* at 197.
- ⁹¹ *Id.* at 197-199.
- ⁹² In addition to the proposals illustrated in Figure 1, EPA has calculated an alternate goal for each state, using a different methodology, on which it is seeking comment. See *id.* at 201-202.
- ⁹³ *Id.* at 206.
- ⁹⁴ *Id.* at 207.
- ⁹⁵ *Id.* at 207-209.
- ⁹⁶ *Id.* at 214.
- ⁹⁷ *Id.* at 215.
- ⁹⁸ *Id.* at 217-218.
- ⁹⁹ *Id.* at 218.
- ¹⁰⁰ *Id.* at 219.
- ¹⁰¹ *Id.*
- ¹⁰² *Id.* at 220.
- ¹⁰³ *Id.* at 224.

¹⁰⁴ *Id.*

¹⁰⁵ *Id.* at 226.

¹⁰⁶ *Id.* at 227

¹⁰⁷ *Id.*

¹⁰⁸ EPA has also proposed an alternate calculation methodology for establishing state goals under Building Block 4, on which it is seeking comment. *Id.* at 228.

¹⁰⁹ *Id.* at 254-255.

¹¹⁰ *Id.* at 255.

¹¹¹ EPA, “Carbon Pollution Standards for Modified and Reconstructed Stationary Sources: Electric Utility Generating Units” (June 2, 2014) (pre-publication version) [EPA-HQ-OAR-2013-0603] *available at* <http://www2.epa.gov/sites/production/files/2014-05/documents/20140602proposal-modsreconstructs.pdf> (hereinafter Modified and Reconstructed Sources Rule).

¹¹² *Id.* at 71.

¹¹³ *Id.* at 73.

¹¹⁴ *Id.* at 71.

¹¹⁵ *Id.* at 73-74.

¹¹⁶ *Id.* at 78.

¹¹⁷ EPA, Regulatory Impact Analysis for the Proposed Carbon Pollution Guidelines for Existing Power Plants and Emission Standards for Modified and Reconstructed Power Plants, 9-3 (June 2014) *available at* <http://www2.epa.gov/sites/production/files/2014-06/documents/20140602ria-clean-power-plan.pdf>.

¹¹⁸ *Id.* at 9-5. *See also* Modified and Reconstructed Sources Rule at 79-80.

¹¹⁹ Modified and Reconstructed Sources Rule at 14-15. *See also* Proposal at 394-97.

¹²⁰ *Id.*

¹²¹ Proposal at 396-97.

¹²² *Id.*

¹²³ *Id.* at 94-95.

¹²⁴ The categories are phosphate fertilizer plants (fluorides), sulfuric acid plants (acid mist), primary aluminum plants (fluorides), Kraft pulp plants (total reduced sulfur) and municipal solid waste landfills (landfill gases). *See* EPA, Legal Memorandum for Proposed Carbon Pollution Emission Guidelines for Existing Electric Utility Generating Units, 9-10 (June 2014) *available at* <http://www2.epa.gov/sites/production/files/2014-05/documents/20140602tsd-legal-memorandum.pdf> (hereinafter Legal Memorandum).

¹²⁵ Legal Memorandum at 10.

¹²⁶ *Id.* at 123

¹²⁷ State Plan TSD at 14-18. EPA is seeking comment on whether other entities might also appropriately be regulated pursuant to CAA Section 111(d) State Plans, as well as whether EPA should promulgate guidance on enforceability considerations for non-EGU entities. Proposal at 472.

¹²⁸ State Plan TSD at 14-18.